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# Formulation And Evaluation Of Facial Scrub From Punica Granatum Peel And Annona Squamosa Seed

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**ABSTRACT :-**

Punica granatum (pomegranate) and Annona reticulata (custard apple) are two medicinally important plants widely recognized in traditional and modern medicine. This review focuses on the comprehensive phytochemical and pharmacognostic evaluation of both species. The phytochemical studies reveal the presence of alkaloids, flavonoids, tannins, phenolic compounds, glycosides, and saponins contributing to their significant pharmacological activities such as antioxidant, antimicrobial, anti-inflammatory, and anticancer effects. Pharmacognostic parameters including macroscopic, microscopic, and physicochemical characteristics have been studied to aid in the standardization and authentication of plant materials. This review aims to consolidate existing knowledge to support further research and potential therapeutic applications of P. granatum and A. reticulata in drug development and herbal formulations.

A facial scrub is a cosmetic product used to clean the skin by removing dead skin cells, dirt, and excess oil from the surface of the face. This process is known as exfoliation. Regular use of facial scrub helps in improving skin texture, unclogging pores, preventing acne, and giving the skin a fresh and healthy appearance.

**Keywords:**- Punica granatum, Annona reticulata, phytochemicals, pharmacognosy, herbal medicine, standardization

## ❖ INTRODUCTION :-

- Antioxidants and bioactive phenolic contents have been reported in the fruits of *pomegranates* that are imperative for better human health.Researchers are interested in searching for beneficial phytochemicals in the peels of fruit and using them in various cosmetic and pharmaceutical industries for humankind's welfare.The pomegranate have many biological activities such as antimicrobial, antiviral, antioxidant, anti-inflammatory, anti diabetic, anti-heart, and anti-cancer ,Pomegranate fruits are used in traditional medicine and medicine for its effectiveness in treating liver fallure, dry cough, facial swelling, skin itching, and jaundice ,Pomegranate peel is useful in treating sore throats, gastrointestinal worms and diarrhoea.The therapeutic potential of pomegranate peel is attributed to the chemical compounds with biological activity such as tannins, ellagic acid, gallic acid, catechns, flavonoids and anthocyanins.

  Food-borne illnesses are still a major concern for consumers, the food industry and food safety authorities. Meanwhile, consumers have been questioning the safety of synthetic preservatives of food. The worldwide spread of antibiotic-resistant pathogens such amethi-
  cillin-resistant Staphylococcus aureus (MRSA) has revived the search for antimicrobial compounds from natural sources, including plants.Spices and herbs have been added to food since ancient times, not only as flavoring agents, but also as folk medicine and food preservatives (Shan et al., 2007). Among constituents of plants, polyphenols have received a great deal of attention, in recent years, due to their diverse biological functions.

- Herbal facial scrubs made from natural ingredients are safer than chemical-based products because they cause fewer side effects and are suitable for most skin types. Natural ingredients provide cleansing, nourishing, and protective effects to the skin.
- Facial scrub is a cosmetic or beauty product, or a treatment designed to cleanse and exfoliate the skin of the face or body.
- The use of facial scrubs proves beneficial in the removal of dirt,dead skin cells, sebum or oil, blackheads, and whiteheads, thereby contributing to the maintenance of skin appearance.
- Pharmacognostic studies, including macroscopic, microscopic, and physicochemical evaluations, provide essential tools for the identification and standardization of herbal drugs. These parameters ensure the quality, safety, and efficacy of plant-based formulations.

## SKIN : -

The skin is the largest organ of the human body, forming a protective barrier between the internal organs and the external environment. It is a complex organ involved in protection, sensation, thermoregulation, and more.

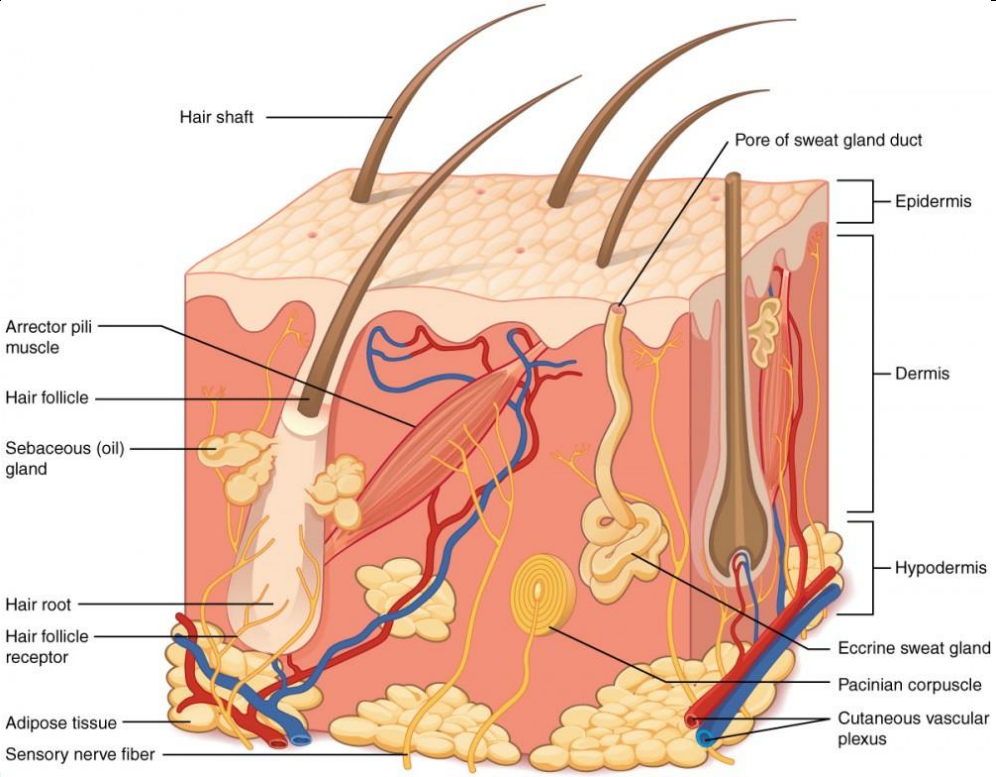



Fig No.1 – Skin

The integumentary system is formed by the skin and its derivative structures. The skin is composed of three layers: the epidermis, the dermis, and subcutaneous tissue. The outermost level, the epidermis, consists of a specific constellation of cells known as keratinocytes, which function to synthesize keratin, a long, threadlike protein with a protective role. The middle layer. the dermis, is fundamentally made up of the fibrillar structural protein known as collagen.

- Layers of Skin:-
  - The skin consists of three main layers:-

A]. Epidermis:-

Sub-layers:-

- Stratum corneum
- Stratum lucidum (only in thick skin)
- Stratum granulosum Stratum spinosum
- Stratum basale

B]. Dermis :

Layers:-

- Papillary layer – loose connective tissue.
- Reticular layer – dense irregular connective tissue.

C]. Hypodermis (Subcutaneous layer):-

Deepest layer.

Made of adipose tissue and loose connective tissue.

Provides insulation, energy storage, and cushioning.

- Functions of Skin :-

1). Protection from physical injury :-

Acts as a barrier against mechanical trauma.

2). Protection from pathogens :-

Prevents entry of bacteria, viruses, and fungi.

3). Protection from UV radiation :-

Melanin in the skin absorbs harmful ultraviolet rays.

4). Prevents water loss :-

1. The stratum corneum maintains hydration and prevents dehydration.

**Facial scrub :-**

- Facial scrub is a cosmetic or beauty product, or a treatment designed to cleanse and exfoliate the skin of the face or body.
- The use of facial scrubs proves beneficial in the removal of dirt,dead skin cells, sebum or oil, blackheads, and whiteheads, thereby contributing to the maintenance of skin appearance.
- It is essential to consider the three primary skin types: oily skin, sensitive skin, and dry skin.
- recommended to be either twice or thrice a week. However, newcomers to facial scrubbing

are generally advised to begin with a weekly routine. Individuals with dry or sensitive skin

types, in particular, should limit exfoliation to once or twice a week. In certain cases,

individuals with acne-prone skin are encouraged to consider products containing salicylic

acid, as well as a dermatologist-grade 4% glycolic and polyhydroxy acid.

- **Benefits of scrub :-**

1. Enhances the skin's radiance and texture: Scrubbing plays a vital role in imparting radiance and a smooth texture to the skin.
2. Eradicates Acne Scars: Through the removal of dead skin cells, scrubbing also helps in getting rid of acne scars on the skin.
3. Enhances Skin Hydration: Facial scrubs contain moisturizing and hydrating agents.

4. Effectively eliminating dust accumulated on the skin's surface, scrubbing proves to be a thorough method for this task.

2. **LITERATURE SURVEY** :-

| Sr no. | Author Name | Year | Title |
|---|---|---|---|
| 1. | Moradi M,Karimi A, shaharani M, Hashemi L,Ghaffari Goosheh M. | 2019 | Anti-influenza virus activity and phenolic content of pomegranate (Punica granatum L.) peel extract and fractions. Avicenna J Med Biotech. |
| 2. | Ghadage P.k Mahamuni and S.S Kachare | 2020 | Formulation and Evaluation of herbal Scrub using Tamarind Peel, International Journal of Research. |
| 3. | Tang F. | 2020 | Formulation and Evaluation of herbal scrub using Tamarind Peel, International Journal of Research. |
| 4. | Bhtia S, Giri S, Lal F, Singh S. | 2020 | Identification Of Potential Inhibitors of Dietary polyphenols for SARS-COV -2 M protease: an in- silico study. |
| 5. | Dhanashree Panadare . | 2021 | Extraction of volatile & non-volatile components from custered apple seed powderusing supercritical CO2 extraction system & its inventorynalysis, process, biochemistry. |
| 6. | MS. Neha | 2022 | Beneficial aspects of custard apple (Annona Squamosa Linn), International Journal for Research in Applied Science & Engineering Technology. |
| 7. | Neeraj Kumari, Suraj Prakash. | 2022 | Seed Waste from Custard Apple (Annona Squamosa Linn): A comprehensive Insight on Bioactive Compounds, Health promoting Activity & Safety Profile. |
| 8. | Bushra S.Sayyad, Tejal Vishe. | 2023 | Formulation and Evaluation of Herbal Face Scrub International Journal of Research Publication and Reviews. |

3. **AIM & OBJECTIVE** : -

**AIM** :-

"Formulation and evaluation of facial scrub from *punica granatum peel* and *Annona squamosa* seed."

**OBJECTIVE** :-

- To highlight the potential therapeutic applications of pomegranate peel and Annona squamosa seeds as natural remedy.
- To prepare a herbal facial scrub using plant materials.
- To study the process of tanning ,Whether for skin exfoliation or surgical hygiene,Removing impurities and promoting healthier state.
- The goal is to remove dead skin cells, improve skin texture and tone, promote circulation, moisturizing skin

4. **PLANT PROFILE** : -

1. *Punica Granatum* peel
2. *Annona Squamosa* Leaf
3. Multani mitti
4. Glycerin
5. Rose Water

**1.*PUNICA GRANATUM :-***

Fig.no.3- *Punica granatum.* *Fig.no.4- Punica granatum peel*

**Synonym:-** *Granatum punicum*, Grenade, Garnet, Mulberry.

**Biological source:-** *Punica granatum* peel is obtained from the dried outer rind of the fruit of *punica granatum* linn.

**Family:-** *Lythraceae*

**Chemical constituent:-** Polyphenols, Flavonoids, alkaloids, organic acid, sugar, minerals.

**Uses:-**

1. Antioxidant effect
2. Antidiabetic effect
3. Anti-inflammatory effect
4. Antibacterial effect
5. Antiviral effect

**2.*ANNONA SQUAMOSA* :-**

Fig. no. 4- *Annona Squamosa*.

Fig. no.5- *Annona Squamosa seed*

**Synonym:** Sugar apple, Sweetsop apple, Custard apple.

**Family:** *Annonaceae.*

**Chemical constituent:** *Annona squamosa* is constitients, including sugars, vitamins, minerals, acetogenins, alkaloids, and other bioactive compounds.

**Uses:**

1.Antimicrobial activity

2. Hepatoprotective activity

3. Pesticide and anti-headlice

4. Anti-thyroidal

5. Anti-helminthic

❖ ***Punica granatum*:**

➢ **Advantages :**

1. Anti-inflammatory: Property it helps to reduce inflammation in the body.
2. Rich in antioxidant: It helps to protect cells form damage.
3. Heart health: It may help to lower blood pressure.
4. Cancer prevention: It may prevent certain type of cancer.
5. Digestive health: It helps in the improve the digestion.
6. Nutrient rich: They provides the essential vitamins and minerals**.**

➢ ***Annona squamosa* :-**

**Advantages:-**

1. It is rich in vitamins.
2. Rich in antioxidant.
3. Boost our immune system.
4. It is used in traditional medicine for their insecticidal pesticide.
5. It is used as a natural pesticide.
6. It helps in digestion.
7. It regulate blood sugar level.

**3. MULTANI MITTI :-**

Fig. no. 6- Multani Mitti.

**Synonyms**:- Fuller's Earth, Indian Healing Clay, Bleaching Clay, Bentonite

**Biological Source:-** Multani Mitti is a natural clay composed primarily of hydrated aluminum silicate and other minerals such as magnesium, calcium, and iron oxides. It is not derived from a plant or animal source but is a type of sedimentary clay.

**Chemical Constituent :-** Hydrated Aluminum Silicate,Main component; gives absorbent and cleansing properties ,Magnesium Oxide (MgO) ,Mildly alkaline, skin soothing ,Calcium Oxide (CaO) Helps in cleansing ,Iron Oxide ($Fe_2O_3$), Gives yellowish-brown color Silica ($SiO_2$) ,Provides mild exfoliation ,Trace Minerals (Na, K, Zn, etc.), Contribute to skin healing and rejuvenation.

**Uses :-**

1. Cosmetics Face packs, scrubs, masks – removes excess oil, cleanses pores, exfoliates dead skin
2. Dermatology Helps in treating acne, pimples, and pigmentation
3. Hair Care Scalp cleansing, dandruff control, oil balancing
4. Pharmaceutical Sometimes used as a base for skin preparations
5. Industrial Used as absorbent in oil refining, grease removal, cleaning agents

**4. GLYCERINE :-**


Fig.no.7- Glycerine.

**Synonyms:-** Glycerol, 1,2,3-Propanetriol, *Glycerin*

**Biological Source:-** Glycerine is a natural compound obtained from both plant and animal sources. It is primarily derived as a by-product during the saponification (alkaline hydrolysis) of fats and oils (triglycerides), especially from: Plant oils: Coconut oil, palm oil, soy oil.

**Family** :- *Arecaceae*

**Chemical Constituents:-**Molecular Formula: $C_3H_8O_3$, Molecular Weight: 92.09 g/

Chemical Structure: $HO–CH_2–CHOH–CH_2–OH$

It is a simple polyol (sugar alcohol) compound containing three hydroxyl (–OH) groups.

**Uses of Glycerine**:-

Cosmetics & Skincare:-

- Moisturizer and humectant (draws moisture to skin)

- Used in lotions, creams, soaps, scrubs, shampoos

**5. ROSE WATER :-**

Fig.no. 8-Rose Water.

**Synonyms**:- Gulab Jal (Hindi), Rose Hydrosol, Aqua Rosae, Arq-e-Gulab

**Biological Source :-***Rose water* is an aqueous solution obtained by the steam distillation of fresh petals of Rosa damascena or Rosa centifolia.

**Family** :- *Rosaceae*

**Chemical constituents :-** Citronellol, Geraniol, Phenyl ethanol, linalool,Flavonoids

**Uses:-** -

1. Skin toner and astringent
2. Anti-inflammatory & soothing agent
3. Antibacterial properties
4. Reduces skin redness and irritation
5. Aromatherapy & relaxation
6. Eye and skin cleanser in herbal cosmetics

## ➢ MATERIALS AND METHODS :-

### 1. Materials :-

**Plant Materials:**

1. *Punica granatum* (Pomegranate) peel
2. *Annona squamosa* (Custard apple) seeds

➢ **Other Ingredients**:

1. Multani mitti
2. Glycerin
3. Rose water / Lavender oil (for fragrance)

➢ **Equipment Used:**

1. Mortar and pestle
2. Hot air oven
3. Grinder
4. Sieve (60–80-85 mesh)
5. Weighing balance
6. Beakers
7. pH meter
8. Magnetic stirrer
9. Spatula

2. **Method of Preparation :-**

➢ **<u>Preparation of Plant Powders :-</u>**

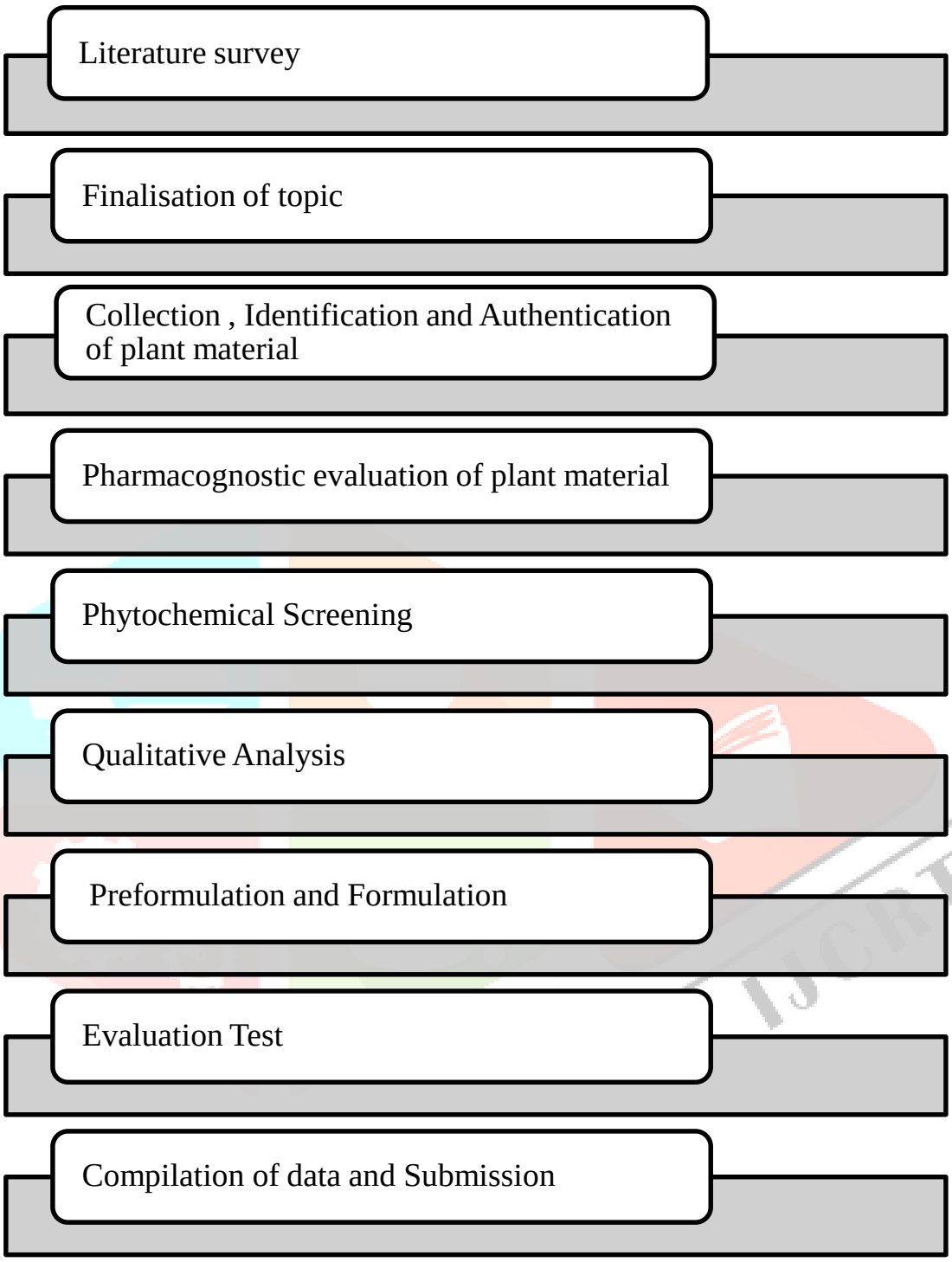
1. **Punica granatum peel powder**:

- Fresh pomegranate peels were washed with water.
- They were shade-dried for 5–7 days.
- Dried peels were powdered using a grinder.
- Powder was passed through a sieve and stored in an airtight container.

2. **Annona squamosa seed powder:**

- Seeds were cleaned and dried.
- They were crushed carefully to obtain fine powder.
- Powder was sieved and store.

5. **PLAN OF WORK** : -



❖ **Ingredients:-**

| Sr No | Ingredient | Components | Common Uses |
|---|---|---|---|
| **1.** | Pomegranate Peel | Vitamin C, Gallic Acid, Fatty Acid | Acne and oil control, Skin brightening, Sun protection |
| **2.** | Annona Squmosa Seed | Vitamin A, C, Flavonids And alkaloids, Saponins | Remove dead skin cells, Anti-aging, Exfoliation |
| **3.** | Rose Water | Antioxident, Anti-inflammatory | Treating acne, Calming redness/ irritation |
| **4.** | Glycerine | Vitamin E | Humectan oil, Dirt |
| **5.** | Multani Mitti | Astringent, Antibacterial agent | Deep pore cleansing, Oil control and Acne treatement, Skin tanning And cooling |

## ❖ METHOD OF PREPARATION

- **Formulation :-**

Raw material were gathered from local market. The natural ingredients were shed dried, powdered and sieved using # 60 mesh, weighed accurately and mixed. For the evaluation of various parameters, the formulated face scrub was stored in an air tight containers.

- **Procedure :-**

1) Weigh accurately all herbal powder such as Punnica Granatum Peel Powder, Annona Squamosa Seed powder, Multani Mitti Powder, Rose Water, Glycerine.
2) Mix them together to form a uniform mixture with the help of mortar pestle.
3) In this mixture, add prepared herbal drug and triturate to from a uniform drug powder of face scrub.

- **Procedure of Herbal Face Scrub Application :-**

1) Take prepared face scrub powder in a bowl as per the requirement and add rose water, glycerine, multani mitti to mix.
2) Mix well and apply over the facial skin. Cover the acne and blemishes spots too. Once the powder dries gentely scrub.
3) The face scrub also serves as scrub when rubbed on skin in gentle motion for few minutes
4) Kept as it is for complete drying for 15 to 20 min and then wash with cold water

## ❖ PREFORMULATION STUDY

1. Bulk density
2. Tapped density
3. Porosity
4. Carr's index
5. Hausner's ratio
6. Angle of repose
7. % Ash Value
8. Solubility

### 1) Bulk density

The bulk density of a powder is the ratio of the mass of an untapped powder sample and its volume including the contribution of the inter-particulate void volume.

FORMULA

$$\text{BULK DENSITY} \quad \frac{\text{MASS}}{\text{BULK VOLUME}}$$

### 2) Tapped density

The tapped density is an increased bulk density attained after mechanically tapping a container containing the powder sample

FORMULA

$$\textbf{TAPPED DENSITY} = \frac{\textbf{MASS}}{\textbf{TAPPED VOLUME}}$$

**3) Porosity**

Porosity or void fraction is a measure of the void (i.e., "empty") spaces in a material, and is a fraction of the volume of voids over the total volume, between 0 and 1, or as a percentage between 0% and 100%.

FORMULA

$$\textbf{POROSITY} = \frac{\textbf{VOLUME OF VOIDS}}{\textbf{TOTAL VOLUME}} \times 100$$

**4) Carr's index**

Carr's Index of any solid is calculated for compressibility of a powder which is based on true density and bulk density.

FORMULA

$$\textbf{CARR'S INDEX} = \frac{\textbf{TAPPED DENSITY} - \textbf{BULK DENSITY}}{\textbf{TAPPED DENSITY}} \times 100$$

**5) Hausner's ratio**

Hausner ratio is defined as the ratio of a powder's tapped bulk density to its poured (loose) bulk density.

FORMULA

$$\textbf{HAUSNER'S RATIO} = \frac{\textbf{TAPPED DENSITY}}{\textbf{BULK DENSITY}}$$

**6) Angle of repose**

Angle of repose powder poured from a vessel forms a cone-like pile. The angle of repose- the angle between the slope of the pile and the horizontal correlates with the strength of particle- particle interactions and, therefore, is measured to infer flow ability

FORMULA

**¢=tan-$^{1}$(h/r)**

Where,

- o h : the height in cm
- o r : the radius in cm
- o : the angle of repose

| Angle AAngle of Repose | Flowability |
|---|---|
| <25gg <25 | EEEEe Excellent |
| 25-30 25-30 | Good Good |
| 30-403 30-40 | Passabl Passable |
| >40 >40 | Very Po Very Poor |

**7) % Ash value**

World Journal of Pharmaceutical Research The ash values usually represent the inorganic residues such as phosphates, carbonates and silicates present in herbal drugs.

FORMULA

$$\%ASH = \frac{W2 - WO}{W1} \times 100$$

- o W2: weight of crucible + ash
- o WO: weight of crucible
- o W1: weight of sample

**8) Solubility**

Solubility is the ability of a solid, liquid, or gaseous chemical substance (referred to as the solute) to dissolve in solvent (usually a liquid) and form a solution. We are going to check solubility of our sample in water, acidic and alkaline solution.

- **Evaluation Parameter:**

**1.Organoleptic Evaluation**

The prepared face scrub was evaluated for various organoleptic parameters such as; color, odor, appearance, texture and consistency. Color, odor and texture were evaluated visually by touch and sensation respectively.

**2.Irritancy Test**:

The prepared face scrub was applied to the previously marked area of a 1 square cm was marked on the left-hand dorsal surface and time was recorded. Skin was then observed for irritancy, erythema and edema (if any), for regular intervals up to 24 hrs

**3.Washability**:

Formulation was evaluated for its ability to get washed off. Face scrub was applied on the skin and then ease and extent of washing with normal tap water were checked manually.

**4. pH determination**:

The presence of acidic or alkaline nature of dried powder of combined form was determined by PH meter. Standard PH of herbal face pack should be 7.6

**5 Ash Value:**

Ash Value indicates the total mineral content and cleanliness of the face scrub formulation.

**6) Moisture Contents**

To evaluate the moisture content of powder, the loss in weight (%) after oven drying at 102 until constant weight is obtained.

Moisture Contents = $\frac{\text{Total weight}}{\text{Dry weight}}$

❖ **Identification test:**

**A) Flavonoid test**

1. **Alkaline Test :**

Powder + NaOH = Yellow colour = Dilute acid HCL

2. **Feric chloride Test:**

Powder + feCl3 = Greenish black colour

3. **Shinodo Test:**

Powder + mg Powder + HCl = Pink, Scarlet red colour indicate

Allow to stand for 10min =stable foam form

4. **Lead Acetate Test:**

Powder + Lead acetate solution = Yellow colour precipitate

**B) Alkaloid test**

**1.Mayer's test:**

Powder + Potassium mercuric iodide = Cream or pale yellow precipitate

**2.Wagner's test:**

Powder + iodine in potassium iodide = Reddish brown precipitate

**3.Dragandroff's test:**

Powder + Potassium bismuth iodide = Orange, Red, Brown precipitate


( Fig no. 9- Flavonoid and Alkaloid test )

❖ **RESULT**

**A. Procurement:**

**B. Aunthentification:**

NANDED EDUCATION SOCIETY'S

**SCIENCE COLLEGE, NANDED**

(Affiliated to Swami Ramanand Teerth Marathwada University, Nanded)
(Re-accredited with "A+" grade by NAAC (CGPA 3.35) 4th Cycle, CPE Status, DST-FIST, NIRF Ranking-72 (Year - 2017), Best College Award SRTMUN)
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Email : sciencecollege1950@gmail.com, www.sciencecollegenanded.org

No. F-12, 1962, 26/06/1950
( MF 1261, 13/10/1961

03/02/2026

## Certificate

I have studied the plant material submitted by **Ms. Sawrate Pooja, Mr. Shaikh Sameer, Mr. Shekde Nishant, Mr. Shengule Omkar** and **Mr. Shewale Dnyaneshwar** students of **B. Pharm** under the guidance of **Dr. A. D. Kshirsagar** (Project Guide), **D. K. Patil Institute of Pharmacy, Loha Dist. Nanded.**

I hereby identify and authenticate that the given Plant material is belonging to

| Sr. No. | Botanical Name of Plant | Family |
|---|---|---|
| 01 | *Punica granatum* L. | Lythraceae |
| 02 | *Annona squamosa* L. | Annonaceae |

This certificate is issued as per request and is given only for academic and Research use.

03/02/2026

**Dr. Vishal R. Marathe**
Professor in Botany,
(Plant Taxonomy Research Lab)
Department of Botany,
N.E.S. Science College, Nanded

**A) Antimicrobial Activity:**

## DEPARTMENT OF MICROBIOLOGY,
## N. S.B. COLLEGE, NANDED.

**Report for Antibacterial Testing**

NSBCN/MICRO/25-26/ Date- 10.03.2026

Medium – Nutrient Agar.
Dose of compound – 5%

Method – Agar Cup method.
Cup size – 8 mm

Compound Deposited by – Dr. A. D. Kshirsagar
D. K. Patil Instiyute of Pharmacy,
Loha,
Nanded.

| Sr. No. | Compound | *Escherichia coli* | *Staphylococcus aureus* |
|---|---|---|---|
| 01 | PPS | -ve | 22 mm |

Legends- - ve - No Antibacterial Activity
Zone of inhibition - -- mm

Microbiologist
Head
Department of Microbiology
N.S.B.College, Nanded.

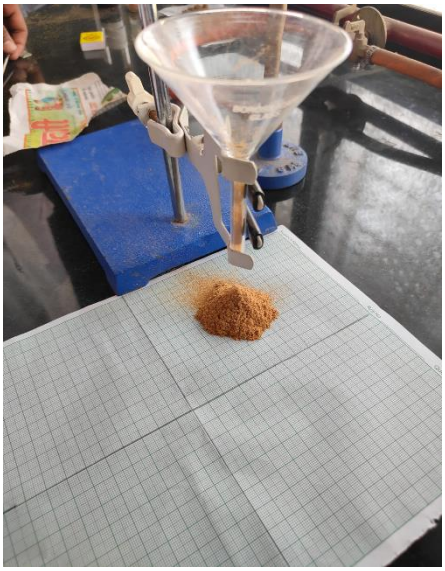
Principal
PRINCIPAL
Netaji Subhashchandra Bose
Art's,Commerce And Science
College,Nanded

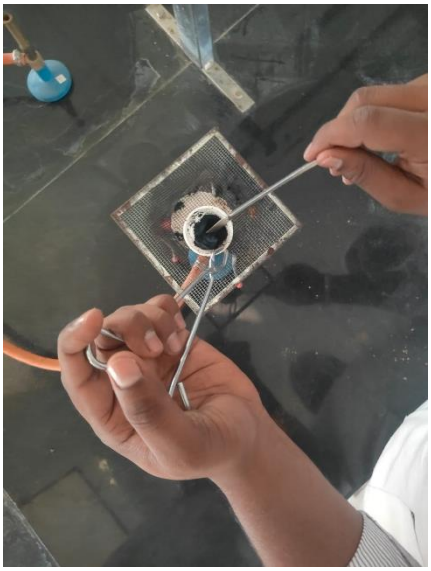

**( Fig no. 10- Antimicrobial test )**

❖ **PRE-FORMULATION TABLE**

| BATCH | $F_1$ (Sieve no. 60) | $F_2$ (Sieve no. 85) | $F_3$ (Sieve no. 80) |
|---|---|---|---|
| 1. Bulk Density | 0.47g/ml | 0.39g/ml | 0.39 g/ml |
| 2. Tapped Density | 0.48 g/ml | 0.45 g/ml | 0.48 g/ml |
| 3. Carr's Index | 8.28% | 12.77% | 7.1% |
| 4. Hausner's Ratio | 1.2 | 1.23 | 1.07 |
| 5. Angle Of Repose | 30°38' | 30°77' | 30°28' |
| 6. % Ash Value | 68.5% | 75% | 82% |

**In this pre-formulation study of formulation sample we observed that, the Batch $F_3$ (Sieve no. 60) has good flow property and other parameter then can be utilized have final preparation of powder.**



**(Bulk Density)** **(Angle of Repose)** **(Ash Value)**

## ❖ SOLUBILITY

- **Solubility of formulation :-**

| BATCH | Solubility in water | Solubility in Acetic acid | Solubility in Ethyl Acetate | Solubility in Ethanol |
|---|---|---|---|---|
| $F_1$ | Soluble | Partially | Poorly Soluble | Soluble |
| $F_2$ | Soluble | Soluble | Poorly Soluble | Soluble |
| $F_3$ | Soluble | Soluble | Partially | Soluble |
| $F_4$ | Soluble | Partially | Poorly Soluble | Soluble |

In this study of formulation sample we observed that Batch $F_3$ sample was soluble in water, Acetic acid, Ethyl Acetate, Ethanol, while other batches are partially soluble or poorly soluble.

## ❖ FORMULATION TABLE:

| Sr no. | Ingreadent | F1 | F2 | F3 |
|---|---|---|---|---|
| 1. | *Punica granutun peel* | 9 gm | 11 gm | 10.30 gm |
| 2. | *Annona squamosa seed* | 2 gm | 1 gm | 2.70 gm |
| 3. | Multani mitti | 4 gm | 3 gm | 2 gm |
| 4. | Glycerine | Small quantity | Small quantity | Small quantity |
| 5. | Rose water | Unlimited | Unlimited | Unlimited |

### ➢ EVALUATION TEST :-

**1. Physical Appearance**

Color, texture, and odor were observed visually.

**2. pH Test**

The pH of the scrub was measured using a digital pH meter.

Ideal pH for skin: 5.5 – 7.0


(Digital pH meter)

**3. Spreadability**

The scrub was applied on glass plate and its spreading ability was checked.

**4. Washability :-**

The scrub was applied on skin and washed with water to check ease of removal.

(Washability)

**5. Skin Irritation Test :-**

The scrub was applied on a small area of skin.

No redness or itching was observed.

(Skin Irritation Test)

**6. Grittiness :-**

The presence of scrub particles was checked by rubbing between fingers.

- **Storage :-**

The formulated scrub was stored in a clean, airtight container at room temperature.

## 7. CONCLUSION :-

Overall, the findings support the traditional use of Punica granatum peel and Annona squamosa leaf in herbal medicine and cosmetics. Future studies focusing on isolation, characterization, and formulation optimization can further establish their pharmacological efficacy and contribute to the development of eco-friendly, affordable, and safe herbal skincare products. Thus, both these plants possess promising potential for incorporation into modern herbal formulations aimed at promoting natural skin care and health benefits**.**

The present review highlights the significant phytochemical and pharmacognostic potential of Punica granatum (pomegranate) peel and Annona squamosa (custard apple) leaves. Both plants are rich in bioactive constituents such as alkaloids, flavonoids, tannins, saponins, phenolic compounds, and glycosides, which are responsible for their wide range of therapeutic and cosmetic applications.

The phytochemical screening confirms the presence of compounds with antioxidant, antimicrobial, anti-inflammatory, and wound-healing properties, making these plant materials valuable for herbal cosmetic preparations, especially in formulations such as herbal face scrubs.

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