



FORMULATION AND EVALUATION OF HERBAL FACE PACK POWDER

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ABSTRACT: The aim of this work is to formulate and evaluate an herbal face pack for glowing skin by using natural herbal ingredients. The natural herbal ingredients such as multani mitti, turmeric, sandalwood, Hibiscus powder, Green Tea powder, Aloevera powder, Nutmeg powder were purchased from local market in Godhra the form dried powder. The powder of nutmeg powder was prepared by shade drying commercially, all powdered natural ingredients were sieved using #40 mesh, weighed accurately and mixed geometrically for uniform formulation and then evaluated for parameters including morphological, physicochemical, physical, phytochemical, irritancy along with stability examination.

Thus, in the present work, we formulated a herbal face pack which can be easily made with the easily available ingredients. After evaluation, we found good properties for the face packs, free from skin irritation and maintained its consistency even after stability storage conditions. Results of the study scientifically verified that herbal face pack having enough potential to give efficient glowing effect on skin. The overall study is useful to substantiate product claims due its useful benefits on the human beings.

KEYWORDS: Herbal Face Pack Powder, Aloevera Face Pack, Multani Mitti Face Pack.

INTRODUCTION:

Skin:

The skin is the largest organ in the body, covering its entire external surface. The skin has 3 layers—the epidermis, dermis, and hypodermis, which have different anatomical structures and functions (Cross Section, Layers of the Skin). The skin's structure comprises an intricate network that serves as the body's initial barrier against pathogens, ultraviolet (UV) light, chemicals, and mechanical injury. This organ also regulates temperature and the amount of water released into the environment.

Skin thickness varies by body region and is influenced by the thickness of the epidermal and dermal layers. Hairless skin in the palms of the hands and soles of the feet is the thickest due to the presence of the stratum lucidum, an extra layer in the epidermis. Regions lacking this extra layer are considered thin skin. Of these regions, the back has the thickest skin because it has a thick epidermis. The skin's barrier function makes it susceptible to various inflammatory and infectious conditions. In addition, wound healing, sensory changes, and cosmesis are significant surgical concerns. Understanding the skin's anatomy and function is crucial for managing conditions across all medical fields.

Epidermis:

The epidermis, the skin's outermost layer, is composed of several strata and various cell types crucial for its function.

Layers of the epidermis:

From the deepest to the most superficial, the epidermal layers are the stratum basale, stratum spinosum, stratum granulosum, stratum lucidum, and stratum corneum. The stratum basale, also known as stratum germinativum, is separated from the dermis by the basement membrane (basal lamina) and attached to it by hemidesmosomes. The cells in this layer are cuboidal to columnar, mitotically active stem cells that constantly produce keratinocytes. This layer also contains melanocytes. The stratum spinosum, comprising 8 to 10 cell layers, is also called the prickle cell layer. This layer contains irregular, polyhedral cells with cytoplasmic processes, sometimes called spines, that extend outward and contact neighboring cells by desmosomes. Dendritic cells can be found in this layer.

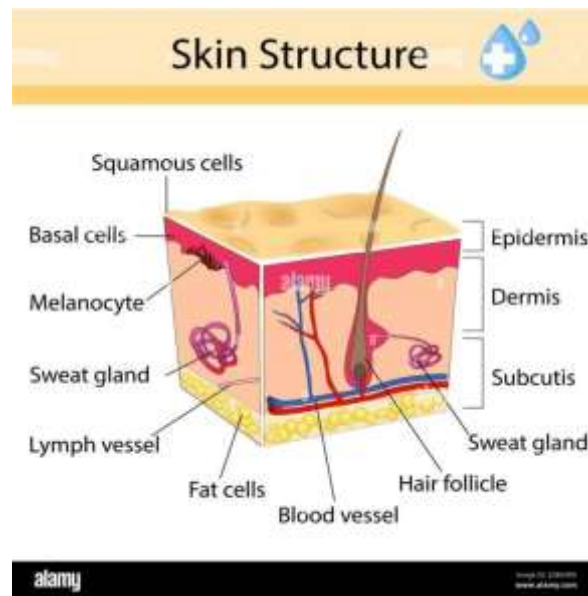
The stratum granulosum has 3 to 5 cell layers and contains diamond-shaped cells with keratohyalin and lamellar granules. Keratohyalin granules contain keratin precursors that aggregate, cross-link, and form bundles. The lamellar granules contain the glycolipids secreted to the cell surfaces, functioning as an adhesive to maintain cellular cohesion. The stratum lucidum comprises 2 to 3 cell layers and is present in thicker skin on the palms and soles. This thin and clear layer consists of eleidin, a transformation product of keratohyalin. The stratum corneum has 20 to 30 cell layers and occupies the uppermost epidermal layer. The stratum corneum is composed of keratin and dead keratinocytes (anucleate squamous cells) that form horny scales. This layer has the most variable thickness, especially in callused skin. Dead keratinocytes release defensins within this layer, which are part of our first line of immune defense mechanisms.

Dermis:

The dermis is connected to the epidermis by the basement membrane. The dermis consists of 2 connective tissue layers, papillary and reticular, which merge without clear demarcation. The papillary layer is the upper dermal layer, which is thinner and composed of loose connective tissue that contacts the epidermis. The reticular layer is the deeper layer, which is thicker and less cellular. This layer consists of dense connective tissue composed of collagen fiber bundles. The dermis houses the sweat glands, hair, hair follicles, muscles, sensory neurons, and blood vessels.

Hypodermis:

The hypodermis, also known as the subcutaneous fascia, is located beneath the dermis. This layer is the deepest skin layer and contains adipose lobules, sensory neurons, blood vessels, and scanty skin appendages, such as hair follicles.



Skin Anatomy

HERBAL FACE PACK POWDER:

The formulation of an herbal face pack powder is designed to promote skin health, enhance complexion, and address common dermatological concerns using natural ingredients. This study introduces a novel blend of hibiscus powder, turmeric, nutmeg, aloe vera powder, sandalwood powder, green tea, and multani mitti powder, each selected for their synergistic therapeutic properties. Hibiscus powder, rich in antioxidants and alpha-hydroxy acids, aids in exfoliation and skin rejuvenation. Turmeric, with its active compound curcumin, offers anti-inflammatory, antimicrobial, and skin-brightening benefits. Nutmeg contributes mild exfoliating and antibacterial properties, supporting acne control. Aloe vera powder provides hydration, soothes irritation, and promotes wound healing due to its polysaccharides and enzymes. Sandalwood powder imparts a cooling effect, reduces pigmentation, and enhances skin texture. Green tea, loaded with catechins, delivers antioxidant and anti-aging benefits, protecting against free radical damage. Multani mitti powder, a natural clay, absorbs excess oil, cleanses pores, and improves skin elasticity. The face pack is prepared by blending these ingredients in optimized proportions to ensure efficacy and safety. This herbal formulation offers a sustainable, chemical-free alternative to commercial skincare products, suitable for various skin types, and demonstrates potential in improving skin tone, reducing blemishes, and maintaining overall skin vitality. Further clinical studies are recommended to validate its long-term efficacy and dermatological benefits.

Detailed Ingredient Roles:

- Hibiscus Powder:** Contains natural AHAs (malic acid) for gentle exfoliation, antioxidants (anthocyanins) for anti-aging, and vitamin C for collagen synthesis, promoting brighter, smoother skin.
- Turmeric:** Curcumin provides anti-inflammatory and antimicrobial effects, reducing acne and redness while inhibiting melanin production for a more even skin tone.
- Nutmeg:** Rich in myristicin and macelignan, it offers antibacterial properties to combat acne-causing bacteria and mild exfoliation to remove dead skin cells.
- Aloe Vera Powder:** Contains aloin and polysaccharides, which hydrate, soothe inflammation, and accelerate skin repair, ideal for sensitive or sunburned skin.
- Sandalwood Powder:** Santalol compounds provide a cooling sensation, reduce hyperpigmentation, and impart a natural glow, while its astringent properties tighten skin.
- Green Tea:** Epigallocatechin gallate (EGCG) neutralizes free radicals, reduces UV-induced damage, and minimizes fine lines, enhancing skin firmness.
- Multani Mitti Powder:** A mineral-rich clay (bentonite) that detoxifies by absorbing impurities and sebum, tightens pores, and improves circulation for a refreshed complexion.

This herbal face pack powder leverages the complementary actions of these ingredients to deliver a holistic skincare solution, aligning with the growing demand for natural, eco-friendly beauty products.

PURPOSE OF HERBAL FACK PACK POWDER:

1. Cleanses the skin: Removes dirt, oil, and impurities from pores.
2. Exfoliates dead skin cells: Promotes smoother, brighter skin.
3. Nourishes the skin: Herbal ingredients like turmeric, green tea, sandalwood, and rose provide essential nutrients.
4. Treats specific skin issues: Helps with acne, pigmentation, tanning, or dryness depending on the ingredients.
5. Improves skin tone and texture: Regular use can lead to glowing and even-toned skin.
6. Soothes inflammation: Herbs like aloe vera and chamomile can calm irritated skin.

CHARACTERISTIC OF HERBAL FACK PACK POWDER:

1. Natural Ingredients
2. Free from Harsh Chemicals
3. Fine Texture
4. Nourishing properties
5. Mild and Gentle
6. Moisturizing
7. Eco-Friendly
8. Shelf-Stable

ADVANTAGE:

1. Natural Ingredients: Minimizes risk of side effects and is gentle on the skin.
2. Free from Harsh Chemicals: Safer than many commercial products.
3. Multi-Benefit: Treats acne, dullness, pigmentation, and more.
4. Customizable: Can be tailored to suit different skin types and concerns.
5. Cost-Effective: Offers many uses per pack and long shelf life.
6. Eco-Friendly: Biodegradable, cruelty-free, and often sustainably packaged.
7. Soothing and Healing: Calms irritated or sunburned skin with ingredients like aloe vera and sandalwood.

DIS-ADVANTAGE:

1. Short-Term Visible Effects: Results may take time and consistency to show.
2. Preparation Needed: Requires mixing with a liquid (like water or rose water) before use.
3. Potential Allergens: Some herbs can trigger allergic reactions in sensitive individuals.
4. Staining or Strong Odors: Ingredients like turmeric can stain skin or clothes, and some may have strong smells.
5. Less Potent Than Some Clinical Products: May not work as fast on severe skin issues.

AIM & OBJECTIVES:**Aim :**

- The aim of the study is Formulation and Evaluation of Herbal Face Pack Powder

Objective :

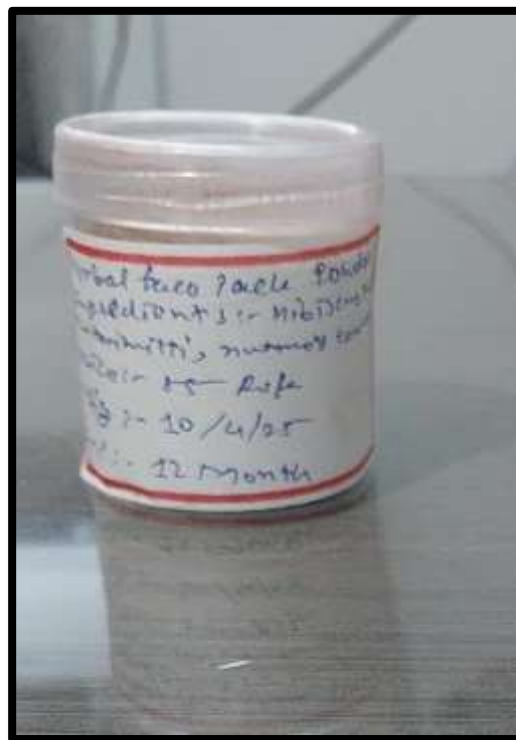
- Main objective of this work is to formulate and evaluate herbal face pack.
- Nutmeg is widely used for antibacterial and antiseptic properties. It help in reducing wrinkles, fine lines and other signs of aging.
- Herbal Fack Pack Removes the Dark Circle, pimples, Scars and maintained it and the rejuvenates the skin and remove dirt particles from the skin pores.
- To formulate and evaluate cosmetic preparation poly herbal face pack made from herbal ingredients.
- Herbal fack pack are used to stimulate blood circulation and help to maintain the elasticity of the skin and remove dirt from skin pores.

MATERIALS & METHODOLOGY:

No.	Ingredient	Botanical Name	Pharmacological Role
1	Hibiscus Powder	Hibiscus Sabdariffa	Antioxidant
2	Sandal wood Powder	Santalum Album	Antimicrobial
3	Multani Mitti Powder	Montmorillonite	Cooling Agent, Skin Brightning
4	Turmeric Powder	Curcuma longa	Anti inflammatory
5	Green Tea	Camellia Sinensis	Anti Aging
6	Aloevera Powder	Aloe Barbadensis	Skin health, Anti septic
7	Nutmeg Powder	Myristica Fragrans	Anti cancer

FORMULATION OF FACE PACK POWDER:

SR. NO.	INGREDIENTS	BATCH-I	BATCH-II	BATCH-III	BATCH-IV
1	Hibiscus Powder	15gm	15gm	15gm	15gm
2	Sandalwood Powder	10gm	11gm	20gm	15gm
3	Multani Mitti Powder	20gm	25gm	20gm	22gm
4	Turmeric Powder	10gm	4gm	3gm	1gm
5	Green Tea Powder	10gm	10gm	10gm	15gm
6	Aloevera Powder	15gm	15gm	12gm	10gm
7	Nutmeg Powder	10gm	10gm	10gm	12gm



Face Pack Powder

METHOD OF PREPARATION OF FACE PACK POWDER:

ALL HERBAL POWDERS FOR FACE PACK WERE WEIGHTED INDIVIDUALLY BY USING DIGITAL WEIGHT BALANCE



ALL INGREDIENTS WERE TRANSFERRED INTO MORTAR PESTLE AND TRITURATED
(EXCEPT HIBISCUS AND NUTMEG)



HERBAL DRUG LIKE HIBISCUS AND NUTMEG WERE TRITURATED IN A SEPARATE MORTAR TO FORM A UNIFORM FINE MIXTURE



MIX BOTH THE MIXTURES OF HERBAL POWDERS AND TRITURATE TO OBTAIN UNIFORM DRUG POWDER OF FACE PACK



POWDERS WERE PASS THROUGH SIEVE NO #40

PREPARED FACE PACK POWDER WAS TRANSFERRED INTO A SELF SEALABLE POLYETHENE BAG

PROCEDURE OF FACE PACK APPLICATION:

Take prepared face pack powder in a bowl as per requirement and add rose water



Mix well to form a paste with optimum thickness



It should be applied evenly on face with help of brush



Cover the acne and blemishes spots



Keep as it is for complete dryness for 20-25 minutes



Then it should be washed with cold water

EVALUATION OF FORMULATION HERBAL FACE PACK POWDER:

May have under go following evaluation test:

Evaluation

SR. NO.	Parameters	F1	F2	F3	F4
1	Appearance	Smooth fine powder	Smooth fine powder	Smooth fine powder	Smooth fine powder
2	Colour	Light Yellow	Yellow	Light Brown	Brown
3	Odour	Pleasant	Pleasant	Pleasant	Pleasant
4	Texture	Fine	Fine	Fine	Fine

PHYSICAL EVALUATION:-**Tapped Density:**

- It is measured by transferring a known quantity (25 gm) of powder into a graduated measuring cylinder
- Place the cylinder containing sample on bulk density apparatus
- Adjust apparatus for 50 tapping and operate
- Record the volume occupied by the powder as V2
- Calculate the tapped density by using formula

Tapped density(g/ml) = Weight of sample (w)/tapped volume(v)

$$= 25g/46ml$$

$$= 0.5434g/ml$$



Tapped Density

Bulk Density:

- It is the ratio of given mass of powder and its bulk volume.
- It is determined by transferring an accurately weighed amount of powder sample to the graduated cylinder with the aid of a funnel. The initial volume was noted. The ratio of weight of the volume it occupied was calculated by using formula,

$$\begin{aligned}\text{Bulk density(g/ml)} &= \text{Weight of sample (W)/Volume of powder(V)} \\ &= 25\text{g}/53\text{ml} \\ &= 0.4716\text{g/ml}\end{aligned}$$



Bulk Density

Angle of Repose:

- It can easily be determined by allowing a powder to flow through a funnel and fall freely onto a surface.
- Angle of Repose = $\theta = \tan^{-1}(h/r)$

- D1 = 8.5cm
- D2 = 7.7cm
- D3 = 8.9cm
- D4 = 8cm
- D = Diameter of Circle
- $R = D / 2$
- R1 = 4.25cm
- R2 = 3.85cm
- R3 = 4.45cm
- R4 = 4cm
- R = Radius of Circle
- Average Radius = $R1+R2+R3+R4= 4.1375\text{cm}$



Angle of Repose

1. Height of the pile taken in this practical (H) = 2cm
2. Average radius of the circle (R) = 4.1375cm
3. Angle of repose = $\theta = \tan^{-1}(h/r) = \tan^{-1}(0.4833)$
4. Result-The Final Angle of Repose is = 25 °

Angle of Repose

Angle of repose (degrees)	Type of flow
< 20	Excellent
20-30	Good
30-34	Passable
> 40	Very poor

Hausner Ratio:-

- It indicates the flow property of the powder. The ratio of tapped density to the bulk density of the powder is called Hausner's ratio.
- Hausners ratio = Tapped density/ Bulk density

$$= 0.5434/0.4716$$

$$= 1.15$$
- A Hausner ratio is less than 1.25 indicates that sample powder is good flowability

Result: 1.15 Hausner's ratio is less than 1.24 it means the product is good flowability.

Hausner Ratio

FLOW CHART	HAUSNER RATIO
Excellent	1.00-1.11
Good	1.12-1.18
Fair	1.19-1.25
Passable	1.26-1.34
Poor	1.35-1.45
Very Poor	1.46-1.59

Carr's Index:-

- The Carr index or Carr's Compressibility Index is an indication of the compressibility of a powder.
- This index is frequently used in pharmaceuticals as an indication of the flowability of a powder.
- Carr's index(%) = Tapped density- Bulk density/Tapped density x 100

$$= 0.5319-0.4716/ 0.5319 \times 100$$

$$= 11.33\%$$

Result:- The Result is between range of 5-15 it means the product compressibility is Excellent.

Carr's Index

Carr's index	Properties
5 – 15	Excellent
12 – 16	Good
18 – 21	Fair to Passable
2 – 35	Poor
33 – 38	Very Poor
>40	Very Very Poor

Washability:-

- This is the common method for the checking the washability of the formulation.
- The formulation was applied on the skin and then ease and extent of washing with water were checked manually by using 1 liter of water is used to remove all content of the formulation were applied on the surface.



Washability



Washability

RESULT:-**The observation of Evaluation Parameter:**

Result

Sr. No.	Evaluation parameter	Observation
1	Colour	Brown
2	Odour	Pleasant
3	Appearance	Smooth fine Powder
4	Texture	Fine
5	Angle of repose	25°
6	Bulk density	0.4716gm/ml
7	Tapped density	0.5434gm/ml
8	Hausner ratio	1.15
9	Carr index	11.33%
10	Washability	easily

DISCUSSION:

HERBAL FACE PACKS ARE USED TO STIMULATE BLOOD CIRCULATION, REJUVENATES THE MUSCLES AND HELP TO MAINTAIN THE ELASTICITY OF THE SKIN AND REMOVE DIRT FROM SKIN PORES. THE ADVANTAGE OF HERBAL COSMETICS IS THEIR NONTOXIC NATURE, REDUCE THE ALLERGIC REACTIONS AND TIME TESTED USEFULNESS OF MANY INGREDIENTS. FORMULATION WAS POWDERED BROWN IN COLOR AND HAD POWDER FOAM CONSISTENCY.

THE FORMULATION WAS FOUND HOMOGENOUS, EASILY WASHABLE AND ALSO HAD VERY SLIGHTLY, WHICH WERE COMPATIBLE WITH NORMAL SKIN PHYSIOLOGY. ANGLE OF REPOSE IS A CHARACTERISTIC RELATED TO INTER PARTICULATE FRICTION OR RESISTANCE TO THE MOVEMENT BETWEEN THE PARTICLES. THE FLOW PROPERTY HAS BEEN CLASSIFIED AS PER LIMIT OF INDIAN PHARMACOPOEIA IN TERMS OF THE ANGLE OF REPOSE. THE RESULTS OF ALL THESE PARAMETERS INDICATED THAT THE DRIED POWDER OF COMBINED FORM POSSESS GOOD FLOW PROPERTIES AND GOOD PACKING ABILITY. CONSEQUENTLY, IT EXHIBITED GOOD FLOW PROPERTIES FOR FORMULATION TO ACHIEVE SOFT, FRESH AND CLEAN FORMULATION.

WITH THE VARYING CONCENTRATIONS, FOUR DIFFERENT FORMULATIONS CONTAINING INGREDIENTS SUCH AS MULTANI MITTI, TURMERIC, ALOEVERA, SANDAL WOOD, HIBISCUS, GREEN TEA AND NUTMEG, WERE PREPARED NAMED AS F1 TO F4. ALL PREPARED FORMULATIONS WERE EVALUATED BY DIFFERENT PARAMETERS LIKE ORGANOLEPTIC PROPERTIES AND PHYSICO-CHEMICAL PARAMETERS. AMONG ALL FORMULATION, F4 WAS FOUND TO BE GOOD IN PHYSICAL PARAMETERS, MAINTAINED ITS CONSISTENCY EVEN AFTER STABILITY STORAGE CONDITIONS.

CONCLUSION:

- IN THE PRESENT SCENARIO, PEOPLE NEED CURE FOR VARIOUS SKIN PROBLEMS WITHOUT SIDE EFFECTS.
- HERBAL INGREDIENTS OPENED THE WAY TO FORMULATE COSMETICS WITHOUT ANY HARMFUL EFFECT.
- FORMULATED HERBAL FACE PACK CONTAINING NATURALLY AVAILABLE INGREDIENTS LIKE MULTANI MITTI, TURMERIC, ALOE VERA, SANDALWOOD, HIBISCUS, GREEN TEA, NUTMEG WHICH GIVES ANTI ACNE PROPERTY.
- IN CONCLUSION, FORMULATED FACE PACK POWDER MET THE EVALUATION PARAMETERS WITH PHYSICAL CHARACTERISTICS.
- THE VALUES OF F4 COMPLY WITH THE STANDARD VALUE AND WAS FOUND TO BE GOOD IN PHYSICAL PARAMETERS, MAINTAINED ITS CONSISTENCY EVEN AFTER STABILITY STORAGE CONDITIONS.

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