



Formulation, Development and Evaluation of Herbal Face Pack Using Ayurvedic Powders for Gleaming and Healthy Skin

Rohan R. Vakhariya^{*1}, Rutuja R. Shah², Swapnil S. Patil², Neha S. Salunkhe³, Dr. S. K. Mohite¹

1. Rajarambapu College of Pharmacy, Kasegaon, Tal. Walwa, Dist. Sangli, Maharashtra, India.

2. Anandi Pharmacy College, Kalambe Tarf Kale, Dist. Kolhapur, Maharashtra, India.

3. Womens College of Pharmacy, Peth Vadgaon, Dist. Kolhapur Maharashtra, India.

*Corresponding author's E-mail: rohanvakhariya@gmail.com

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ABSTRACT

Natural remedies are more acceptable in the belief that they are safer with fewer side effects than the synthetic ones. Herbal formulations have growing demand in the world market. Herbal face packs or masks are used to stimulate blood circulation, rejuvenates those muscles and help to maintain the elasticity of the skin and remove dirt from skin pores. It is a very good attempt to establish the herbal face pack containing different powders of plants. The objective of this work is to formulate and evaluate a cosmetic herbal face pack for all type skin by using natural ingredients with the varying concentrations, three different formulations containing ingredients such as sandal wood powder, orange peel powder, green tea, raktachandan, aloe powder, haridra, methi powder, multani mitti procured from the local market. Then different batches were prepared named as F1, F2 & F3, then passed through sieve, mixed geometrically and evaluated for its organoleptic and physio-chemical, general powder and chemical evaluation. The dried powder of combined form had passable flow property which is suitable for a face pack. All prepared formulations were evaluated by different parameters like organoleptic properties and physio-chemical parameters and stability along with irritancy test. In this study it is concluded that all the formulations of face packs found to be good in physical parameters, free from skin irritations so we found good properties for the face packs and further optimization studies are required on this study to find the useful benefits of face packs on human use as cosmetic product.

Keywords: Herbal formulation, Face pack, stability, skin irritations, cosmetic.

INTRODUCTION

Everyone wants to have fair and attractive skin. Today, acne, blackheads, pimples, dark circles are common among young people and people suffering from them. According to Ayurveda, skin problems are usually due to impurities in the blood. Toxins that accumulate in the blood from improper diet and lifestyle cause skin related diseases. Various herbs and medicines are prescribed in Ayurveda to purify the blood. The herbal paste applied to the face to treat acne, pimples, scars, scars and pigments is known as "Mukhalepa" in Ayurveda. The process of spreading this mixture of herbs on the face is known as "Mukhalepana". This beauty treatment is popular as a facial.¹ The main advantage of using herbal cosmetics is that it is pure and has no side effects on the human body. People have rough skin, and if not properly cared for, the skin will darken from excessive sun exposure, other pollutants, etc.²



Figure 1: Herbal Face Pack

Facial skin is an important part of the body that indicates a person's health. It consists of materials such as amino acids, fat, carbohydrates, etc., therefore a balanced diet is necessary to keep the skin clean and healthy.³ Face masks are one of the oldest and most beautiful methods of cleansing the skin. There are different types of facial masks described in Ayurveda that have nutritional, healing, cleansing, astringent and antiseptic properties. Ayurveda is the science of life which deals with maintenance of health of healthy persons and cure of ailing humanity as its main ambition.⁴ Since ancient times, people have used herbs for cleaning, beauty, and management. Cosmetics are defined as products used to clean, beautify, promote attractiveness, or change appearance. The face pack is the soft powder used for face application. These preparations are applied to the face as a liquid or paste and left to dry and dry to form a film that gives the skin a firming, strengthening and cleansing effect. They usually remain on the skin for ten to twenty-five minutes to evaporate all the water and clean face.⁵ Multani mitti removes all impurities and dead skin cells. Soothes inflammation caused by aggravated acne. Removes dirt, dead skin cells that build up and replace with fresh and glowing skin. Haridra has anti-inflammatory and anti-allergic effects. It is the best blood cleanser and helps in wound healing. It has the best blood purifying effect, so it is used for all diseases with blood contamination. Raktachandan has therapeutic value in skin allergies. Raktachandan powder refreshes and soothes, protects the skin from the effects of pollution.⁶

Methi powder Repairs damaged skin moisture on the skin Acne healing, moisturizes the skin, anti-aging effect. Orange peel heals blackheads, the accumulation of cells around the pores brightens your face, dark circles, dry skin, eliminates tanning. Green tea many scientists believe that free radicals contribute to the aging process. The polyphenols in green tea help fight aging. Makes your skin look younger and better.^{7, 8} Aloe Vera is used as an ornamental plant as well as for herbal medicines. Aloe Vera is valuable for skin disorders. Provides a feeling of freshness and nourishes skin cells. It is also a good moisturizer for the skin. In cosmetology, Aloe vera specifically addresses the problem of pigmentation, rashes, itching, blisters, skin aging, sunburn and pimples. It contains almost 20 amino acids, minerals, vitamins, polysaccharides and many other nutrients that make it a wonderful beauty herb.⁹

Benefits of Face Pack: ¹⁰

- Moisturizes and hydrate the skin, herbal face packs supply essential antibacterial properties to skin.
- Face packs remove dead cells of skin and provide a calming and relaxing effect on skin.
- It helps to reduce acne, pimple, scars and marks depending on its herbal ingredients.
- Usually Neem and Tulsi face masks help reduce the development of acne and pimples.
- Facial masks recommended for acne, pimples and blackheads generally control the excessive release of sebum from the sebaceous glands and eliminate harmful bacteria inside the skin.
- The scars and marks of skin can be reduced by adding fine powder of sandal, rose petals and orange peel power with acne face pack.

Precautions to be taken while applying face pack: ¹⁰

- The face mask should not be left on the face for more than 15 to 20 min.
- It can be stored for a long time leads to the formation of wrinkles, sagging skin and expansion of open pores.
- Apply the face mask once a week.
- Do not try to peel or dry itchy face pack. It can hurt underlying skin.
- Do not rub the face vigorously.
- This can lead to rash from pimples and brown spots.
- Stay away from warm up when applying the face mask.
- Avoid applying a face mask near the "eye area".
- The skin the eye area is very sensitive.
- The removal process the face mask can damage the skin around the eyes.

MATERIALS AND METHODS

The crude drug required in our project was procured from nearby Ayurvedic Medical shop. All ingredients were washed, dried, powdered finely for further use. The following ingredients were used for the preparation of the herbal face pack formulation.¹¹

Sandal Wood Powder (Santalum Alba): Sandal wood has an anti-tanning and anti-aging property. Sandalwood protects the skin against the impact of environmental pollution and keep the skin cool, fair and healthy. Sandalwood is helpful Ayurvedic herb with antimicrobial properties is used for healing various skin problems and removes scars. Sandalwood is a class of woods from trees in the genus Santalum. The woods are heavy, yellow, and fine-grained, and, unlike many other aromatic woods, retain their fragrance for decades. Sandalwood oil is extracted from the woods for use.¹²



Figure 2: Sandal Wood Powder

Orange Peel Powder (Citrus Aurantium linn): Orange peel powder contains Vitamin C which helps to form collagen and elastin which is the secret to beautiful skin. It makes your skin look youthful and bright. It improves oily skin and makes the skin soft, smooth and firm. It helps unclog pores and reduces blackheads. It reduces pigmentation, acne, marks, and scars on the face. It helps even and lightens the skin tone. It works as a natural cleanser, astringent, scrub, moisturizer and toner. It contains antioxidants which slow down wrinkles, sagging and skin aging. It helps reduce inflammation and shrinks pores. It gives off a rejuvenating scent which when added to water for a bath keeps you feeling fresh for hours.¹³



Figure 3: Orange Peel Powder

Green Tea (*Cameliasinensis* leaves and bud): Green tea is touted to be one of the healthiest beverages on the planet. It's loaded with antioxidants that have many health benefits. Tea is rich in polyphenols, which are natural compounds that have health benefits, such as reducing inflammation and helping to fight cancer. Contains healthy bioactive compounds. Green tea does more than just keep you alert; it may also help boost brain function. Increases fat burning. Antioxidants may lower the risk of some cancers. May protect the brain from aging and reduce bad breath. May help to prevent cardiovascular disease. May help you lose weight. May help you live longer.¹⁴



Figure 4: Green Tea

Raktachandan Powder (*Pterocarpus Santalinus*):

Red sandalwood is a tree. The wood at the centre of the trunk (heartwood) is used as medicine. Red sandalwood is used for treating digestive tract problems, fluid retention, and coughs; and for blood purification. Red sandalwood might increase the loss of body water through the urine (diuretic effect). It might also have drying effects that may help reduce diarrhoea and break up mucus to make it easier to cough up. Red sandalwood might have an effect like a water pill or diuretic. Taking red sandalwood might decrease how well the body gets rid of lithium. This could increase how much lithium is in the body and result in serious side effects.¹⁵



Figure 5: Raktachandan Powder

Aloe Vera (*Aloe Barbadensis*): Aloe Vera is a great moisturizer intended for a skin. Aloe Vera rejuvenates skin, hydrates this and keeps skin layer looking fresh all the time. Aloe Vera has anti-microbial property rendering it ideal to deal with acne and pimples. Aloe Vera powder contains several nutrients like glycerine, sodium palmate, sodium carbonate, sodium palm kemelate, sorbitol, etc.

Aloe Barbadensis has anti-microbial property rendering it ideal to deal with acne and pimples. Aloe Vera is a great moisturizer intended for a skin. Aloe Vera powder contains several nutrients like glycerine, sodium palmate, sodium carbonate, sodium palm kemelate, sorbitol. You can use aloe Vera to keep your skin clear and hydrated. This may be because the plant thrives in dry, unstable climates. To survive the harsh conditions, the plant's leaves store water. These water-dense leaves, combined with special plant compounds called complex carbohydrates, make it an effective face moisturizer and pain reliever.¹⁵



Figure 6: Aloe Powder

Haridra (*Curcuma Longa*):

Haridra is used in the traditional system of medicine. It is used as an antioxidant and possesses various beneficial properties such as anti-inflammatory, anti-allergic, antiseptic, blood cleansing etc. It is widely prescribed Ayurvedic drug and is used in various diseases. (*Curcuma longa*) Haridra has anti-inflammatory. It is best blood purifier and helps in wound healing. It possesses best blood purification action so it is used in all disease with blood impurities origin. Haridra is rejuvenator of skin and revitalizes skin; delays the signs of aging like wrinkles. Delays the signs of aging like wrinkle and also used for Immunity, Healthy Skin and Anti-aging Solution.¹⁵



Figure 7: Haridra

Fenugreek (*Trigonella Foenumgraecum*): Fenugreek powder is a powerhouse of numerous health-promoting nutrients like dietary fibre, protein, vitamin B1, B2, B3 and C, zinc, iron. Fenugreek is taken by mouth for digestive problems such as loss of appetite, upset stomach, constipation, inflammation of the stomach (gastritis). Fenugreek is also used for diabetes, painful menstruation, polycystic ovary syndrome, Improve milk production and flow. Improve weight loss. Raise testosterone and boost

sperm count. Reduce inflammation. Reduce the risk of heart and blood pressure conditions.¹⁶



Figure 8: Methi Powder

Procedure of Face Pack Formulation:¹⁷

- **Weighing:** All the required herbal powders for face pack preparation were accurately weighed individually by using digital balance. The quantity and compositions are listed in Table No.1.
- **Mixing:** All these fine ingredients were mixed thoroughly by mixer to form a homogenous fine powder.
- **Sieving:** Then this fine powder was passed through sieve, to get the sufficient quantity of fine powder.
- **Collection and storage:** The powder mixture was collected and store in suitable plastic container and used for doing evaluation parameters.

Formulation Table:

Table 1: Formulation Table of Herbal Face Pack

Sr. No.	Name of the Ingredients	Batches of Herbal Face Pack		
		F1	F2	F3
1	Sandal Wood Powder	20	20	20
2	Orange Peel Powder	10	10	10
3	Green Tea	10	10	10
4	Raktachandan	10	10	10
5	Aloe Powder	10	10	10
6	Haridra	5	10	15
7	Methi Powder	5	10	15
8	Multani Mitti	30	20	10

How to Apply Face Pack:¹⁷

- Take prepared face pack powder in a bowl as per the requirement.
- Add water or rose water to mix it well and apply over the facial skin.
- Cover the acne and blemishes spots.
- Kept as it is for complete drying for 30 to 40 min.
- Then wash the face with cold water.

Evaluation of Face Pack:

A. Organoleptic Properties:

Organoleptic properties include its nature, colour, odour, texture, smoothness etc.

B. Physicochemical Properties:

Physicochemical properties were determined including the pH, ash value, loss on drying, acid insoluble ash and water soluble ash.¹⁸

1. pH: pH of the aqueous solution of formulation was measured by pH meter.¹⁸

2. Ash Value: Ash value is a criterion to judge the identity or purity of the crude drug. Inorganic salts such as carbonates, phosphate, calcium, sodium, potassium are known as ash content.^{17, 18} Place about 2-4g of the ground air-dried material, accurately weighed, in a previously ignited and crucible (usually of platinum or silica). Spread the material in an even layer and ignite it by gradually increasing the heat to 500-600°C until it is white, indicating the absence of carbon. Cool in a desiccators and weigh. If carbon-free ash cannot be obtained in this manner, cool the crucible and moisten the residue with about 2 ml of water or a saturated solution of ammonium nitrate R. Dry on a water-bath, then on a hot-plate and ignite to constant weight. Allow the residue to cool in suitable desiccators for 30 minutes and then weigh without delay. Calculate the content of total ash in mg per g of air-dried material.

3. Acid Insoluble Ash: Place about 2-4g of the ground air-dried material, accurately weighed, in a previously ignited and tarred crucible (usually of platinum or silica). Spread the material in an even layer and ignite it by gradually increasing the heat to 500-600°C until it is white, indicating the absence of carbon. Cool in desiccators and weigh. If carbon-free ash cannot be obtained in this manner, cool the crucible and moisten the residue with about 2 ml of water or a saturated solution of ammonium nitrate R. Dry on a water-bath, then on a hot-plate and ignite to constant weight. Allow the residue to cool in suitable desiccators for 30 minutes and then weigh without delay.¹⁹ Calculate the content of total ash in mg per g of air-dried material.

4. Water Soluble Ash: To the crucible containing the total ash, add 25 ml of water and boil for 5 minutes. Collect the insoluble matter in a sintered-glass crucible or on an ash less filter-paper. Wash with hot water and ignite in a crucible for 15 minutes at a temperature not exceeding 450°C. Subtract the weight of this residue in mg from the weight of total ash. Calculate the content of water-soluble ash in mg per g of air-dried material.¹⁸

5. Loss On Drying: A method commonly used for moisture content determination is the loss-on-drying method, or LOD. It is used to specify many major quality specifications. This is based on the thermo gravimetric principle, in which a substance is heated until no more weight is lost, that is, it is completely dry. At the beginning and after dryness is achieved, the weight of the substance is measured. The

final weight loss is calculated, and represents the moisture content of the sample. A variety of techniques is used to bring about vaporization of moisture, including a drying oven heated by gas, which works on convection, and ovens which work by infrared or microwave radiation.

C. General Powder Properties:

It includes tapped density, bulk density, angle of repose, hausner's ratio, Carr's index.

1. Tapped Density: Tapped density is an increased bulk density attained after mechanically tapping a container containing the powder sample. After observing the initial powder volume or mass, the measuring cylinder or vessel is mechanically tapped for 1 min and volume or mass readings are taken until little further volume or mass change was observed. It was expressed in grams per cubic centimetre (g/cm^3).¹⁸

2. Bulk Density: Bulk Density is the ratio between the given mass of a powder and its bulk volume. Required amount of the powder is dried and filled in a 50 ml measuring cylinder up to 50 ml mark. Then the cylinder is dropped onto a hard wood surface from a height of 1 inch at 2 second intervals. The volume of the powder is measured. Then the powder is weighed. This is repeated to get average values. The Bulk Density is calculated by using the below given formula.²⁰

$$\text{Bulk Density} = \text{Volume}/\text{Mass}$$

3. Angle of Repose: It is defined as the maximum angle possible in between the surface of pile of powder to the horizontal flow. It required amount of dried powder is placed in a cylindrical tube open at both ends is placed on a horizontal surface. Then the funnel should be raised to form a heap. The height and radius of the heap is noted and recorded. For the above method, the angle of repose (θ) Can be calculated by using the formula.¹⁸

$$\theta = \tan^{-1}(h / r)$$

Where, θ – Angle of repose,

h – Height of the heap,

r – Radius of the base.

4. Hausner's Ratio: It is expressed as the tap density divided by the bulk density.¹⁹

5. Carr's Index: - Carr's index is an indication of compressibility of powder.

6. Washability: This is the common method for 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.¹⁷

D. Irritancy Test:

Mark an area (1sq.cm) on the left-hand dorsal surface. Definite quantities of prepared face packs were applied to the specified area and time was noted. Irritancy, erythema,

edema, was checked if any for regular intervals up to 24 hrs and reported.¹⁸

E. Microbial Assay:

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 h broth culture of *Escherichia coli* and *Pseudomonas aeruginosa* causative 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 introduced into the wells at randomly. The plates were incubated at 37°C for 24 hours. The antibacterial activities were evaluated by measuring the zones of inhibition (in mm).^{18, 19.}

RESULT AND DISCUSSION

Three formulations of herbal face pack containing variation in their composition were prepared, evaluated and studied its different properties and characteristics.

A. Organoleptic Properties: Appearance, colour, odour, texture, smoothness was observed as shown in Table 2.

Table 2: Organoleptic Properties of Herbal Face Pack

Sr. No.	Organoleptic Properties	Observation		
		F1	F2	F3
1	Nature	Powder	Powder	Powder
2	Colour	Light Creamy	Creamy	Yellowish Creamy
3	Odour	Pleasant	Pleasant	Pleasant
4	Texture	Fine, Smooth	Fine, Smooth	Fine, Smooth
5	Smoothness	Smooth	Smooth	Smooth

B. Physicochemical Evaluation: Ash values, pH, LOD, acid insoluble ash, water soluble ash of all three batches of formulations were calculated and those calculations are as shown in Table 3.

Table 3: Physicochemical Properties of Herbal Face Pack

Sr. No.	Physicochemical Properties	Observation		
		F1	F2	F3
1	Ash Value	2.5gm	2.9gm	1.9gm
2	pH	7.8	7.12	7.6
3	LOD	4.01gm	3.53gm	3.35gm
4	Acid Insoluble Ash	0.8gm	0.83gm	0.77gm
5	Water Soluble Ash	0.98gm	1.23gm	1.1gm

C. General Powder Characteristics: Various characteristics of formulations like angle of repose, bulk density, tapped density, Carr's index, hausner's ratio, wash ability, grittiness and nature of face after wash were performed and results are as shown in Table No.4 which are desirable as cosmetics face packs.



Table 4: General Powder Characteristics of Herbal Face Pack

Sr. No.	General Powder Characteristics	Observation		
		F1	F2	F3
1	Angle of repose	33.82 degree	30.54 degree	30.11 degree
2	Bulk density	0.476gm/ml	0.480gm/ml	0.471gm/ml
3	Tapped density	0.49gm/ml	0.58gm/ml	0.50gm/ml
4	Carr's index	4.081	4.000	6.000
5	Hausner's Ratio	1.029	1.041	1.061
6	Washability	Easily Washable	Easily Washable	Easily Washable
7	Grittiness	No	No	No
8	Nature of face after wash	Soft and Clean	Soft and Clean	Soft and Clean

D. Irritancy Test: In all three batches irritancy, erythema, edema was checked. The formulations are safe for the use of the human skin.

Table 5: Irritancy Test of Herbal Face Pack

Sr. No.	Parameters	Observation		
		F1	F2	F3
1	Irritant	No	No	No
2	Erythema	No	No	No
3	Edema	No	No	No

E. Microbial Assay: Antimicrobial evaluation was performed with two organisms. The results of evaluation are shown in Table 6.

Table 6: Antimicrobial Evaluation of Herbal Face Pack

Sr. No.	Bacteria	Zone of Inhibition of Formulation (mm)		
		F1	F2	F3
1	<i>Escherichia coli</i>	34	39	36
2	<i>Pseudomonas aeruginosa</i>	32	34	31

CONCLUSION

India is one of the largest countries gifted by variety of Ayurvedic plants. But due to globalisation, marketing many of us moved towards foreign cosmetic but in recent time many of the consumers observed its side effects. Due to this reason herbal face pack are always preferable than the other cosmetics which have many sides effect and many of them are carcinogenetic when used for longer duration of time. In this formulation studies we observed that combination of Sandal wood powder, orange peel powder, green tea, raktachandan, aloe powder, haridra, methi powder, multani mitti worked wonderfully. This herbal face pack not only used for premature aging, but also useful for stimulating blood circulation, to remove dirt, rejuvenates face muscles. These formulations are safe to use also affordable than the synthetic ones. The prepared face pack is nontoxic, safe and can be used for all type of skin. At last facial skin indicates the person's health; it should be treated well so use of herbal face pack is good.

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