

Formulation and Evaluation of Herbal Face Pack for ACNE-Prone Skin and Dull Skin

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ABSTRACT ACNE and dull skin are the common problem arising in various people. For this demand of herbal formulation is increasing day by day. The objective of this work is to formulate and evaluate a herbal face pack for acne and dull skin from herbal ingredients:- Multani mitti, orange peel, sandalwood, shalmali, neem, turmeric, masoor dal, tomato, rice and sesame seed were collected from local market. The ingredients have been reported in this research paper having good anti-inflammatory, anti-oxidants and anti-microbial activity. All the constituents are dried, powdered and passed through sieve no 10. The face pack were prepared and evaluated for various parameters like colour, appearance, consistency, washability, pH, Bulk density, tapped density, total ash, acid insoluble ash, partial size and antimicrobial activity. Thus in present work, we found good properties of face pack.

Keywords: Anti-inflammatory, Anti-oxidants, Anti-microbial, ACNE, Dull skin, Parameters

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INTRODUCTION

Everybody wants to get fair and charming skin but nowadays acne, blackheads, whiteheads, pimples; dark circles are common among youngsters and persons who suffers from it.^[5] Acne vulgaris is an extremely common disorder of the skin (pilosebaceous unit) that affects virtually all individuals at least one during life. The incidence of acne most observed in teenage, but the men and women between 20-30 years of age also affected by disorder. Acne may be classified comedonal, popular, pustular, cystic and nodular. Comeodonal acne is non-inflammatory and it has two types whiteheads and blackheads. Whiteheads are closed comedones with microscopic opening whereas blackheads are open comedones with wider than normal opening.^[11]

According to Ayurveda, skin problems are normally due to impurities In the blood. Accumulated toxins in the blood and improper food and lifestyle are causing skin related disease. In Ayurved, "Mukha Lepa" is herbal paste paste which is applied for face to treat acne, pimple, scars, marks and pigments. The process of smearing this herbal mix on

face is known as "mukha Lepana". This beauty therapy is also known as facial. The smooth powder which is used for facial application is known as "Face Pack". A good herbal facepack most must be able to penetrate subcutaneous tissue and delivers the essential nutrients to the skin.^[14]

When herbal face pack used according to us skin type, then we get maximum benefits of herbal face pack like by increasing glow and fairness. These are various kinds of face packs described in Ayurveda which have nourishing, healing, astringent, cleansing and antiseptic properties.^[6]

Cosmetics are defined as products used for the purpose of cleansing, beautifying, promoting attractiveness or altering one's appearance. The natural facepack contain some vitamins which are essential for health and glow of skin. The herbal face pack act by improving blood circulation in the veins of skin but the effect of facial face packs generally temporary, so for regular glow it should be used 2-3 times a week.^[14,6]

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Benefits of Applying Face Packs^[14, 11, 6]

1. Nourishes the skin. Fruits face packs supply essential nutrients to the skin.
2. Face pack usually remove dead cells of skin.
3. Helps to reduce acne, pimples, scars and marks depending on its herbal ingredients.
4. These face packs provide a soothing and relaxing effects on skin.
5. Regular use of natural face masks bring glow to skin, improve skin texture and complexion.
6. They help to restore the lost shine and glow of skin in short span of time.
7. The harmful effects of pollution and harsh climates can be effectively combated with judicious use of face packs.
8. They help to prevent premature aging of skin.
9. Formation of wrinkles, fine lines and sagging of skin can be effectively controlled by using natural face packs.
10. Natural face packs make the skin look young and healthy.

Precautions to be Taken While Applying Face Packs^[14, 11]

1. Select the face packs according to your skin type.
2. The face pack should not be left on face, for more than 15-20 minutes. Keeping for very long times may result in formation of wrinkles, sagging of skin and enlargement of open pores.
3. Avoid applying face pack near "eye zone". The skin around eye is very delicate.

4. Applying face pack in a week. Don't try to peel or strain the dried face packs. This may harm underlying skin.
5. Spray water on face before removing dried face pack. After removing the mask roll an ice cube on facial skin which helps to use open pores and tightens skin.

Ideal Properties of Face Packs^[11, 12]

1. It should be non-irritating and non-toxic.
2. It should be stable both physically and chemically.
3. It should be free from gritty particles.
4. It should have pleasant odour.
5. They should be capable of producing significant cleansing of the skin.
6. They should produce a sensation of tightening of the skin after application.
7. They should form a smooth paste.

MATERIAL AND METHOD

The crude drugs used in this study of our research were procured from the nearby local area. The entire ingredient used were cleaned, washed, shade dried and powdered finely for preparation of face pack. The following ingredients were used for preparation of this polyherbal face pack formulation.^[14]

Multani Mitti (Calcium Bentonite)

Multani mitti helps skin in different ways like diminishing pore size, removing blackheads and whiteheads, soothing sunburns, cleaning skin, and giving a glowing effect to skin. Its

Table 1: Ingredients Used in Herbal Facepack

S. No.	Ingredients	F1	F2	F3	F4
		Qty in gm	Qty in gm	Qty in gm	Qty in gm
1	Orange peel powder	10	10	9	11
2	Neem powder	10	10	8	9
3	Sandalwood powder	15	17	16	15
4	Turmeric powder	5	4	5	4
5	Fullers earth	15	12	13	14
6	Shalmali throne powder	20	22	23	21
7	Masoor dal flour	8	7	8	7
8	Tomato powder	5	6	5	7
9	Rice flour	10	13	12	11
10	Sesame seed powder	2	1	1	1

Figure 1: Fullers Earth



cooling action soothes the skin, and give relief to inflammation caused by aggravated pitta. It remove dirt and dead skin cells accumulated and replace with fresh radiant and glowing skin.^[14, 6]

Neem (Azadirachta Indica)

Neem has antibacterial, anti-inflammatory antiseptic and highly beneficial for acne prone skin and oily skin. An Anti-acne property is due to the antioxidant, anti-inflammatory and anti-microbial activity of various phyto-constituents of neem.^[6, 5]

Figure 2: Neem



Orange Peel (Citrus Sinesis)

Orange peel powder has the radial scavenging activity which has majority responsible for glowing skin action. Orange is citrus fruit which contains different nutritional source such as vitamin C. Calcium, potassium and magnesium. It also prevent acne, blemishes, wrinkles and aging.^[2, 6]

Figure 3: Orange Peel



Shalmali (Bombex Ceiba)

The throne of bombax ceiba have antioxidant and anti-inflammatory activity. It has application to curve acne.^[3, 7]

Figure 4: Shalmali



Turmeric (*Curcuma Longa*)

Turmeric has been shown to anti-inflammatory, antimicrobial, antioxidant properties. It mainly use for rejuvenate the skin. It is best source of blood purifier. It is effective in treatment of acne due to its antimicrobial, antioxidant and anti-inflammatory property. It also reduce the oil secretion by sebaceous glands.^[13, 6]

Figure 5: Turmeric



Tomato (*Solanum Lycopersicum*)

Tomato have the antioxidant properties, due to which it has application on acne prone skin and dull skin. It rejuvenate the skin.^[9]

Figure 7: Tomato



Masoor Dal (*Lens Culinaris*)

Lens culinaris has free radical scavenging capacity, Anti-oxidant activity. It is effective for dull skin, acne and various skin problem.^[1]

Figure 6: Masoor Dal



Rice (*Oryza Sativa*)

The powder of *Oryza ativa* have antioxidant property due to which it provide good effect on face skin^[5].

Figure 8: Rice



Sesame Seed (*Sesamum Indicum*)

Sesame oil contains sesamum that has anti-inflammatory properties. This compound mainly help to ease the inflammation associated with acne breakouts.

Figure 9: Sesame Seed



Sandal Wood (*Santalum Album*)

Sandal wood remove the dark spots from skin. It has anti-tanning and anti-aging property. It also help skin in many ways

Figure 10: Sandal Wood



such as tanning effect , sodium carbonate, sodium palm kemelate, etc.^[6]

Procedure^[6]

1. Weigh accurately all herbal powder such as Orange peel powder, Chandan powder, Neem powder and Tomato powder.
2. Mix them together to form a uniform mixture with the help of mortar pestle.
3. Weigh accurately Rice powder, Multani Mitti, Shalmali, Turmeric, Masoor dal, Sesame seed and mix them together to form a uniform mixture.
4. In this mixture, add prepared herbal drug and triturate to form a uniform drug powder of face pack.

Procedure for Development of Formulation of Face Pack Application^[14, 6]

1. Various formulation were prepared according to table.
2. The prepared face pack powder in a bowl as per requirement, add water (rose water) to mix it well upto forming a smooth paste.
3. Apply this paste over a skin which covers acne , blackheads and whiteheads.
4. Keep it for 30-40 Min and then wash the face with cold water.

EVALUATION^[6, 11]

To evaluate the goodness of our prepared face pack we performed following evaluation parameter.

Physical Evaluation

Physical Parameter of our face pack such as colour, odor, appearance and texture were checked visually.

Determination of Moisture Content

Weigh about 2 gm of powdered face pack into a weighed flat and thin porcelain dish. Dry it in Hot Air Oven at 100 °C-105 °C, until two consecutive weighing do not differ by more than 0.5 mg. Cool in dessicator and weigh the loss in weight is usually recorded as moisture.

Total Ash

Place about 2 g of ground air dried material, accurately weighed, in a previously ignited and tared crucible (usually of platinum or silica). Spread the material in an oven 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 dessicator

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 a suitable desiccator for 30 min and then weigh without delay. Calculate the content of total ash in mg per g of air-dried material.

Acid-Insoluble Ash

To the crucible containing the total ash, add 25 ml of hydrochloric acid (~70g/l) TS, cover with a watch glass and boil gently for 5 min. Rinse the water-glass with 5 ml of hot water and add this liquid to the crucible. Collect the insoluble matter on an ash less filter-paper and wash with hot water until the filtrate is natural. Transfer the filter-paper containing the insoluble matter to the original crucible, dry on a hot-plate and ignite to constant weight. Allow the residue to cool in suitable desiccators for 30 min and then weigh without delay. Calculate the content of acid-insoluble of acid-insoluble ash in mg per g of air-dried material.

Water-Soluble Ash

To the crucible containing the total ash, add 25 ml of water and boil for 5 min. 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 min 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 of water ash in mg per g of air-dried material.

Particle Size

Particle size is a parameter, which affect various properties like spread ability, grittiness, etc., particle size was determined by sieving method by using I.P. Standard sieves by mechanical shaking for 10 min.

Angle of Repose

It defined as the maximum angle possible in between the surface of pile of powder to the horizontal flow.

Open-Ended Cylinder Method

It required amount of dried powder is placed in a cylinder 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 heap is noted and recorded. For the above method, the angle of repose (ϵ) can be calculated by using the formula.

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

where, ϵ - Angle of repose,

h - Height of the heap,

r - Radius of the base

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 sec 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.

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

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 centimeter (g/cm^3).

Spreadability

Spreadability was determined by an apparatus suggested by fabricated in-house. The apparatus consist of a wooden block with a fixed glass slide and movable glass slide with one end tied to weight pan rolled on the pulley, which was in the horizontal level with fixed slide. The spreadability of the formulated gel was measured on the basis of 'Slip and Drag' characteristics of gel. An excess of gel (about 2 g) under study was placed on this ground slide. The gel was then sandwiched between two slides. One kg weight was placed on the top of the two slides for 5 min to excel air and to provide a uniform film of the gel between the slides. Excess of the gel was scrapped off from the edges. The top plate was then subjected to pull off 50 gm. Mix with the help of string attached to the hook and the time (T, in seconds) required by the top slide to move a distance of 7.5 cm be noted. A shorter interval indicated better spreadability.

Microbial Assay

The antibacterial activities of different formulations were determined 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 aureginosa* a 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 the zones of inhibition (in mm).

Washability

This is the common method for checking the washability of the formulation were 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.

RESULTS AND DISCUSSION

The result of evaluation test carried out of a face pack which includes nature, color, odour, taste, texture, ash values, mixture, contents and pH of dried powder provide information about organoleptic and physiochemical evaluation.

Figure 11: Four Types of Formulations



Table 2: Evaluation of Herbal Facepack

S. No.	Evaluation Parameter	Observation			
		F1	F2	F3	F4
I.	Organoleptic Evaluation				
1	Nature(appearances)	Powder	Powder	Powder	Powder
2	Color	Dark Brown	Brownish Yellow	Faint Brown	Brownish White
3	Odour	Pleasant	Pleasant	Pleasant	Pleasant
4	Texture	Fine	Fine	Fine	Fine
II.	Physiochemical Evaluation				
1	Total Ash	1.62 gm	1.42 gm	1.56 gm	1.48 gm
2	Acid Insoluble Ash	0.19 gm	0.17 gm	0.19 gm	0.16 gm
3	Water Insoluble Ash	0.28 gm	0.26 gm	0.25 gm	0.29 gm
4	Moisture Content	0.39 gm	0.37 gm	0.38 gm	0.36 gm
5	pH	7.51	6.5	7.3	6.9
III.	General Powder Characters				
1	Particle Size	25-30 um	28-32 um	29-33 um	30-35 um
2	Angle of Repose	28.60°	27.52°	29.22°	30.14°
3	Bulk Density	0.416gm/ml	0.412 gm/ml	0.411 gm/ml	0.621 gm/ml
4	Tapped Density	0.5747 gm/ml	0.5241 gm/ml	0.5967 gm/ml	0.6021 gm/ml
5	Nature of face after wash	Soft and fresh, clean from Dirt	Soft and fresh, clean from Dirt	Soft and fresh, clean from Dirt	Soft and fresh, clean from Dirt

Figure 12: Zone of Inhibition (Clindamycine, Herbal Facepack, Normal Saline Solution)



Table 3: Antimicrobial Evaluation of Clindamycine, Herbal Facepack, and Normal Saline Solution

S. No.	Zone of Inhibition		
	Marketed Formulation (Clindamycine)	Herbal Preparation (Face Pack)	Control (Normal Saline)
F1	35	36	No Zone of Inhibition
F2	36	35	No Zone of Inhibition
F3	34	33	No Zone of Inhibition
F4	35	32	No Zone of Inhibition

These indicate that the preparation formulated has good flow properties. Anti microbial evaluation was performed on micro-organism, i.e., Propionibacterium acne in which drug shows zone of inhibition.

Herbal face packs are used for the purpose like deep cleansing, astringents, stimulating, tanning, hydrating and Nourishing. They are used to stimulate blood circulation and rejuvenate the muscles. They maintain elasticity of skin and remove dirt from it.

The major advantages of herbal face pack is, it is defined from natural sources, so any of the chemical ingredients is not involved. This is non-toxic in nature and reduce allergic reaction.

By performing the test like washability, angle of repose, pH it give idea about formulation. The formulation found homogeneous, easily washable, the pH is slightly alkaline

which is more suitable with our skin. The value of angle of repose indicates the powder has good flow properties.

CONCLUSION

Nature remedies are more acceptable to the people than synthetic, in the belief that they are safer and fewer side effects that they compare with synthetic.

In the 21st century, the demand for herbal formulation has been increased day to day. So we try to establish the herbal face pack containing the natural ingredient of plants. Thus in present work we found good properties of herbal face pack and further optimization studies are required on this study to find useful benefits of herbal face pack on human.

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