

FORMULATION AND EVOLUTION OF HERBAL ANTIBACTERIAL FACE PACK

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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. The objective of this work is to formulate and evaluate a cosmetic preparation polyherbal face pack made from herbal ingredients. Kaoline, tragacanth, orange peel powder, neem powder, chandan powder, aloe juice powder, turmeric powder, Fullers earth and Cicer arietinum Powder were procured from the local market in dried, powdered and then passed through sieve no 80, mixed thoroughly prepared and evaluated for its organoleptic, physico-chemical and microscopical characters. The dried powder of combined form had passable flow property which is suitable for a face pack.

Herbal face packs or masks are used to stimulate blood circulation, rejuvenates 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 advantage of herbal cosmetics is their non-toxic nature, reduce the allergic reactions and time tested usefulness of many ingredients. Thus in the present work, we found good properties of 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.

Key Words Cosmetic, Face Pack, Herbal, Ingredients, Natural, Product Rejuvenates.

1. INTRODUCTION

Everybody wants to get fair and charming skin. Now a day, Acne, black head, pimples, dark circle are common among youngsters and person who suffers from it. According to Ayurveda, Skin problems are normally due to impurities in blood. Accumulated toxins in the blood during improper food and lifestyle are causing skin related diseases. Various herbs, medicines are described in Ayurveda for blood purification. The herbal paste which is applied on face to treat acne, pimple, scars, marks and pigments are known as "mukha lepa" in ayurveda. The process of smearing this herbal mix on face is known as "mukha lepana". This beauty therapy is popular as facial¹. The smooth powder which is used for facial application is "face pack". A good herbal face pack must supply necessary nutrients to skin. It should penetrate the subcutaneous tissues in order to deliver the required nutrients. Different types of skin need different types of herbal face packs².

The face packs which are mentioned in ayurveda help women to get rid of wrinkles, dark circles, pimples and acne. Herbal face packs increase the fairness and smoothness of skin. We can derive the maximum benefits of herbal face packs by using them according to our skin type. These face packs increase skin glow and are best ayurveda treatment to increase fairness. Face packs are one of the oldest and beautiful methods of cleansing skin. There are various kinds of face packs described in Ayurveda which have nourishing, healing, cleaning, astringent and antiseptic properties. From the ancient era people are using herbs for cleaning, beautifying and to manage them. Cosmetics are defined as the products used for the purposes of cleansing, beautifying, promoting attractiveness or alternating one's appearance². Homemade natural face packs and masks make way for smooth, radiant and silky skin. Face packs used in ayurveda helps to reduce wrinkles, pimples, acne and dark circles. They also increase the fairness and smoothness of the skin³. The Natural face packs do contain some vital vitamins that are required for the health and glow of our skin. These substances also prove to be beneficial for our skin in many ways. Natural Facial Packs are less complicated and pretty simple to use. They help us in looking after skin and also prove its worthiness by increasing the circulation of the blood within the veins of the face⁴. Effects of the facial packs are generally temporary and for the regular glow it should be used 2-3 times a week⁵.

1.1 Benefits of Applying Face Pack⁶

1. Nourishes the skin. Fruit face packs supply essential nutrients to skin.
2. Helps to reduce, acne, pimple, scars and marks depending on its herbal ingredients.
3. Face packs usually remove dead cells of skin.
4. These face masks provide a soothing and relaxing effect on skin.
5. They help to restore the lost shine and glow of skin in short span of time.
6. Regular use of natural face masks bring glow to skin, improve skin texture and complexion.
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.

Face packs which are recommended for acne, pimple, black heads usually control the over discharge of sebum from sebaceous glands and remove the harmful bacteria inside acne lesion. The scars and marks of skin can be reduced by adding fine powder of sandal and orange peel with acne face pack.

2. Materials and methods

The Face pack prepared accordingly the particle size and their binding property mixed thoroughly in plastic bag which shown in figure no 01

Sr no	Ingredient	F1	F2	F3	F4
		Qty in gm	Qty in gm	Qty in gm	Qty in gm
1	Orange peel Powder	8	10	08	05
2	Neem powder	12	09	10	15
3	Sandalwood powder	20	18	23	20
4	Aloe in solid powder form	05	10	07	10
5	Turmeric powder	10	07	10	05
6	Fullers earth	15	10	20	20
7	Cicer arietinum Powder	15	20	10	10
8	Kaolin	10	10	05	10
9	Liquorice	5	06	07	05

Tabel No-01

2.1 Orange peels (*Citrus sinensis*) Orange is a citrus fruit which contains different nutritional source such as vitamin C, calcium, potassium and magnesium. It prevents the skin from free radical damage, skin hydration and oxidative stress. Also it has instant glow property, prevent acne, blemishes, wrinkles and aging.⁷

2.2 Neem powder (*Azadirachta indica*) Neem is anti-inflammatory, antiseptic and highly beneficial for oily and acne prone skin.⁸ An anti-acne effect is due to anti-microbial, anti-inflammatory and anti-oxidant activities of different chemical constituents⁹

2.3 Sandalwood powder (*Santalum alba*) It is use if skin is oily for removing dark spot on skin. Sandalwood has an anti-tanning and anti-aging property¹⁰. It also helps skin in many ways like toning effect, emollient, antibacterial properties, cooling astringent property, soothing and healing property¹¹.

2.4 Aloe (*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 glycerin, sodium palmate, sodium carbonate, sodium palm kemelate, sorbitol, etc.¹²

2.5 Turmeric powder (*Curcuma longa*) Turmeric is mainly used to rejuvenate the skin. It delays the signs of aging like wrinkles and also possesses other properties like antibacterial, antiseptic and anti-inflammatory. It is best source of blood purifier. It is effective in treatment of acne due to its antiseptic and antibacterial properties that fight pimples and breakouts to provide a youthful glow to your skin. It also reduces the oil secretion by the sebaceous glands^{13,14}.

2.6 Fullers earth (*Calcium bentonite*)

Multani mitti helps skin by different ways like diminishing pore sizes, removing blackheads and whiteheads fading freckles, soothing sunburns, cleansing skin, improving blood circulation, complexion, reducing acne and blemishes and gives a glowing effect to a skin as they contain healthy nutrients. Multani mitti is rich magnesium chloride.¹⁵

2.7 Tragacanth

Use as an emollient in cosmetic¹⁶.

2.8 Kaoline

China clay reduces oily skin purifies pores and cleanse skin. And treat acne and make a skin in toning and softening.¹⁶

2.9 *Glycyrriza glabra* (liquorice)

For the removal of skin pigmentation¹⁷.

3. Procedure

- Weight accurately all herbal powder such as orange peel powder, neem powder, chandan powder, aloe juice powder.
- Mix them together to form a uniform mixture with the help of mortar and pestle.
- Weigh accurately kaolin, multani mitti, turmeric and tragacanth powder and triturate them together to form a uniform mixture.
- In this mixture add previously prepared herbal drug and triturate to obtain a uniform drug powder of face pack.

3.1 Procedure of Development of Formulations Face Pack Application^{14, 15 22}

Various formulation batches were prepared according to the Table. 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 and then wash the face with cold water.

4 EVALUATIONS OF FORMULATIONS

Following evaluation parameters were performed to ensure superiority of prepared face pack.

4.1 Physical evaluation

Physical parameters such as colour, odour, appearance and texture were checked visually.

4.2 Determination of moisture content

Weigh about 1.5 gm of the powdered drug into a weighed flat and thin porcelain dish. Dry in the oven at 100°C or 105°C, until two consecutive weighings do not differ by more than 0.5 mg. Cool in desiccators and weigh. The loss in weight is usually recorded as moisture.¹⁸

4.3 Total ash:

Place about 2-4g of the ground air-dried material, accurately weighed, in a previously ignited and tared 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 desiccator 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 minutes and then weigh without delay. Calculate the content of total ash in mg per g of air-dried material.

4.4 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 minutes. Rinse the watch-glass with 5 ml of hot water and add this liquid to the crucible. Collect the insoluble matter on an ashless filter-paper and wash with hot water until the filtrate is neutral. 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 a suitable desiccator for 30 minutes and then weigh without delay. Calculate the content of acid-insoluble ash in mg per g of air-dried material.

4.5 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 ashless 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.¹⁹

4.6 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.

4.7 Angle of repose

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

4.8 Open - ended cylinder method

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.

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

Where, θ – Angle of repose,
h – Height of the heap,
r – Radius of the base

4.9 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.

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

4.10 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/cm³).^{21,22, 24,25,26.}

4.11 Spreadability

Spreadability was determined by an apparatus suggested by fabricated in-house. The apparatus consists 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 2g) 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 expel 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 spreadability²⁷.

4.12 pH

pH of 1% aqueous solution of the formulation was measured by using a calibrated digital pH meter at constant²⁸.

4.13 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 aureginosa* acausative 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). The results of evaluation are shown in Table²⁹

4.14 Washability

This is the common method for checking the washability of the formulation. 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 surface²⁸.

5 RESULTS AND DISCUSSION

The results of evaluation are displayed in Table For organoleptic and physico-chemical and general powder evaluation. The study of nature, color, odour, taste, texture, ash values, moisture content and pH of dried powders of combined form under investigation provided the important feature of organoleptic and physicochemical evaluation. The presence of ash in the dried powder of combined form was evaluated for total ash and acid insoluble ash values. The yielded was found to be 4.3g total ash and 2.9g acid insoluble ash. And moisture content value was found to be 5%. The moisture content values observation clearly indicated that the powder of combined form was hygroscopic in nature. The acidic or alkaline nature of the dried powder of combined form was determined by preparing 1% dispersion of powder form in distilled water and measuring the pH with pH meter. The pH of 1% dispersion of powder was obtained as 7.21 which indicated that the powder of combined form were slightly alkaline in nature. Dried powder of combined form was evaluated for particle size, angle of repose, bulk density and tapped density before being formulated. Values of particle size, angle of repose, bulk density and tapped density obtained for powder of combined form were found to 25-30 μ m, 15° \pm 1°05", 0.486g/cc and 0.408g/cc respectively, have good flow properties. The powder had passable flow property which is suitable for a face pack. And it's easily washable with water. Antimicrobial evaluation was performed with three organisms *Staphylococcus aureus*, *Staphylococcus epidermidis* and *Propionibacterium acnes* Zone of inhibition was found in formulation was displayed in table 2

S. No.	Evaluation parameters	Observation			
		F1	F2	F3	F4
Organoleptic evaluation					
1	Nature	Powder	Powder	Powder	Powder
2	Odour	Pleasant	Pleasant	Pleasant	Pleasant
3	Colour	Yellowish	Yellowish white	Yellowish white	Yellow
4	Texture	Fine	Fine	Fine	Fine
Physicochemical Evaluation					
Ash values					
5	Total Ash	2.5 %	2.7 %	2.1 %	2.4 %
6	Water soluble Ash	1.2	1.3	0.9	1.4
7	Acid insoluble ash	0.58	0.60	0.45	0.52
8	PH	7.3	6.8	7.2	6.9
9	Moisture content	2.4% w/w	1.8% w/w	1.3% w/w	2.7% w/w
General powder Characters					
10	Particle size	28-32 μ m	25-30 μ m	29-33 μ m	30-35 μ m
11	Angle of Repose	33	36	31	34
12	Bulk density	0.75gm/ml	0.83gm/ml	0.78gm/ml	0.81gm/ml

13	Tapped density	0.68gm/ml	0.74gm/ml	0.70gm/ml	0.73gm/ml
14	Washability	Easily washble	Easily washble	Easily washble	Easily washble
15	Grittiness	Nil	Nil	Nil	Nil
16	Nature of face after wash	Soft and clean	Soft and clean	Soft and clean	Soft and clean

TABLE NO 02 EVALUATION OF POLY HERBAL FRUIT FACE MASK

Sr no.	Bacteria	Zone of Inhibition of formulation (mm)			
		F1	F2	F3	F4
1	Escherichia coli	36	42	39	38
2	Pseudomonas aureginosa	35	36	33	35

Table 3: ANTIMICROBIAL EVALUATION OF POLY HERBAL FRUIT FACE MASK

6. CONCLUSION

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. Thus in the present work, 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.

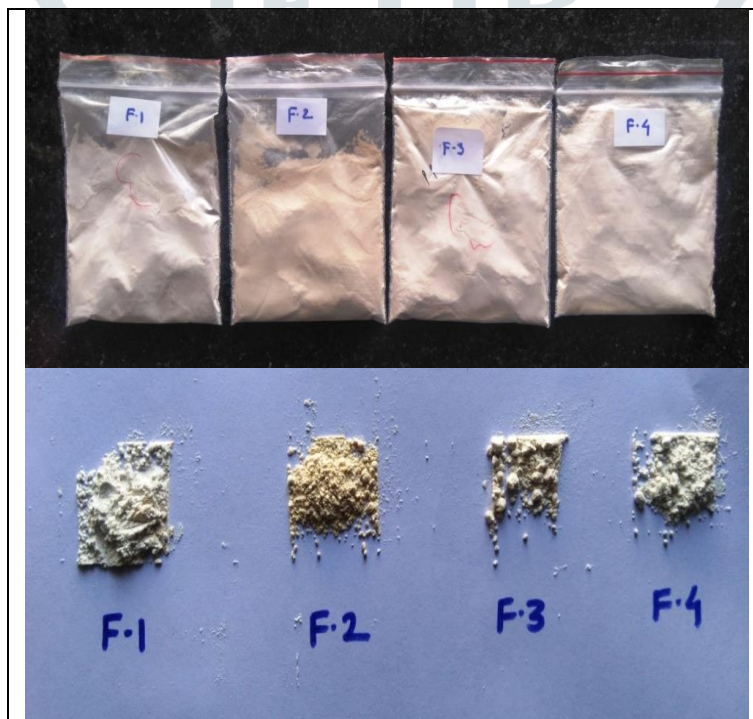


Figure No. 01

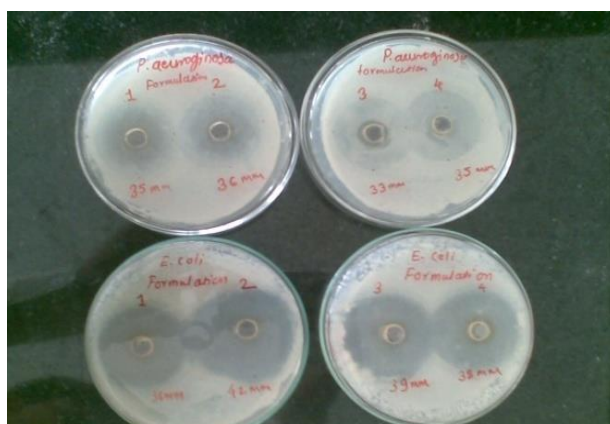


Figure. No 02

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