

PREPARATION AND EVALUATION OF HERBAL ANTI –ACNE FACE PACK

Rokade Priya^{1*}, Khadke Anand² and Devale Rasika³

¹*YSPM's Yashoda Technical Campus, Wadhe, Satara, Maharashtra, India-415011.

^{2,3}Department of Pharmaceutical Chemistry YSPM's Yashoda Technical Campus, Wadhe, Satara, Maharashtra, India-415011.

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***Corresponding Author**

Rokade Priya

YSPM's Yashoda Technical
Campus, Wadhe, Satara,
Maharashtra, India-415011.

ABSTRACT

Herbal formulations have growing demand in the world market. The present work deals with the development and evaluation of the herbal anti-acne face pack containing dried powder of neem leaves (*Azadirachta indica*), the fruits of nutmeg (*Myristica fragrance*), papaya (*Carica papaya*), turmeric (*Curcuma amada*), Masoor Daal (Red Lentil), Gram Flour (*Fabaceae*). The plants have been reported in the literature having good antimicrobial, Anti-oxidant and anti-inflammatory activity. Face Pack were prepared and evaluated for various parameters like colour, appearance, consistency, washability,

pH, Bulk Density, tapped density, total ash, acid insoluble ash, particle size and antimicrobial activity. The herbal anti acne containing hydro-alcoholic extract of neem leaves (*Azadirachta indica*) and fruits of nutmeg (*myristica fragrance*).

KEYWORDS: Neem, Nutmeg, Gram flour, Masoor Dal, Papaya, Turmeric, Anti-microbial assay.

INTRODUCTION

Acne vulgaris is an extremely common disorder of the skin (pilocebaseous unit) that affects virtually all individuals at least once during life. The incidence of acne peaks of teenage, but substantial numbers of men and women between 20-30 years of age are also affected by the disorder.^[1] Acne may be classified as comedonal, papular, pustular, cystic and nodular. Comedonal acne is non-inflammatory and divided into two types: whiteheads and blackheads. White heads (closed comedo) present as fresh or white colored, raised bumps whereas blackhead (open comedo) present as open pores containing dark colored skin

roughage consisting of melanin, sebum and follicular cells. The natural face pack 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 face pack 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 face. Effects of the face pack are generally temporary and for the regular glow it should be used 2-3 times a week.^[2]

Topical formulations, available in the market are as follows: Gel, Cream, Lotion, Face wash or cleansers, Face pack or mask. Neem (*Azadirachta indica*, Meliaceae) and nutmeg (*Myristica fragrans*, Myristicaceae) are reported to have very beneficial effect on acne due to anti-microbial, anti-inflammatory and anti-oxidant activities of different chemical constituents.^[3,4,5]

1. Benefits of Applying Face Pack^[6,7]

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

1.1 Precautions to be Taken While Applying Face Pack^[6]

1. Select the face pack according to your skin type. Take opinion of natural therapist or concerned skin expert before applying face pack.
2. The face pack should not be left on face more than 15 to 20 minutes. Keeping for very long time 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.

1.2 Ideal Characteristics Of Face Pack

1. It should be non-irritating and nontoxic.
2. It should be stable both physically and chemically.
3. It should be free from gritty particles.
4. It should have pleasant odour.

MATERIALS AND METHODS

Myristica fragrans



Scientific classification

Kingdom:	Plantae
Clade:	Angiosperms
Clade:	Magnoliids
Order:	Magnoliales
Family:	Myristicaceae
Genus:	<i>Myristica</i>
Species:	<i>M. fragrans</i>

Binomial name

Myristica fragrans

Lentil



Lentils

Scientific classification

Kingdom:	Plantae
Division:	Magnoliophyta
Class:	Magnoliopsida
Order:	Fabales
Family:	Fabaceae
Subfamily:	Faboideae
Tribe:	Vicieae
Genus:	<i>Lens</i>
Species:	<i>L. culinaris</i>

Binomial name

Lens culinaris
Medikus

Mango ginger



Scientific classification

Kingdom:	Plantae
Clade:	Angiosperms
Clade:	Monocots
Clade:	Commelinids
Order:	Zingiberales
Family:	Zingiberaceae
Genus:	<i>Curcuma</i>
Species:	<i>C. amada</i>

Binomial name

Curcuma amada
Roxburgh

Synonyms

Curcuma mangga Valetton & van Zijp



Sprouted chickpea

Scientific classification

Kingdom:	Plantae
(unranked):	Angiosperms
(unranked):	Eudicots
(unranked):	Rosids
Order:	Fabales
Family:	Fabaceae
Genus:	<i>Cicer</i>
Species:	<i>C. arietinum</i>

Binomial name

Cicer arietinum

			
Papaya cross section		<i>Azadirachta indica</i> , flowers and leaves	
Scientific classification		Scientific classification	
Kingdom:	Plantae	Kingdom:	Plantae
(unranked):	Angiosperms	(unranked):	Angiosperms
(unranked):	Eudicots	(unranked):	Eudicots
(unranked):	Rosids	(unranked):	Rosids
Order:	Brassicales	Order:	Sapindales
Family:	Caricaceae	Family:	Meliaceae
Genus:	<i>Carica</i>	Genus:	<i>Azadirachta</i>
Species:	<i>C. papaya</i>	Species:	<i>A. indica</i>
Binomial name		Binomial name	
<i>Carica papaya</i>		<i>Azadirachta indica</i>	

Table no. 1 Ingredients and Their Uses ^[8,9]

Sr. No.	Name Of Ingredients	Uses
1.	Nutmeg seed	Antimicrobial, Antiseptic, Anti –inflammatory.
2.	Red Lentil	Cleanser.
3.	Turmeric	Antibacterial, Antifungal and It protects the skin from many skin infection and also add glow to the face.
4.	Gram flour	Cleanser.
5.	Papaya	Bleaching agent, Antioxidant.
6.	Neem	Antibacterial, Antifungal, antiseptic and highly beneficial for oily & acne skin

2.1 Collection of Plant Materials

Leaves of neem were collected from local area of Satara. Fruits of nutmeg were purchased from the local market of Satara. Papaya, turmeric, gram flour red lentil were purchased from the local market.

2.2 Preparation For Herbal Anti-acne Face pack^[8,9]

All the herbal ingredients are in dry form and grinded to make fine powder.

2.2.1 Weighing

All the required herbal powders for face pack preparation were accurately weighed individually by using digital balance. The quantity and composition are listed in table number 2.

Table no. 2 Composition of Face Pack

Sr. No	Ingredients	Quantity
1.	Nutmeg (<i>Myristica fragrans</i>)	10 gm
2.	Red Lentil (<i>Lens culinaris</i>)	10 gm
3.	Turmeric (<i>Curcuma amada</i>)	5 gm
4.	Gram Flour (<i>Cicer arietinum</i>)	10 gm
5.	Papaya (<i>Carica papaya</i>)	5 gm
6.	Neem (<i>Azadirachta indica</i>)	10 m

2.2.2 Mixing



All these fine ingredients of turmeric powder, papaya powder, gram flour, nutmeg powder, neem powder, red lentil were mixed thoroughly by mixer to form a homogenous fine powder.

2.2.3 Sieving

After the mixing of all fine powder ingredients were passed through sieve no.40, to get the sufficient quantity of extra fine powder.

2.2.4 Collection and Storage

The powder mixture was collected and store in suitable plastic container and used for doing evaluation parameters.

How to use?

1. Prepare powder of all materials – Turmeric, Papaya, Gram flour, Nutmeg, Neem, Red Lentil.
2. Mix all powder as per formula.
3. Make the paste mixing final mixture of herbs with rose water or water.
4. Apply paste locally in face.
5. Wash the face with fresh water.

2.3 Evaluation of Formulations^[8,9,10,11]

2.3.1 Organoleptic evaluation

Physical parameters such as colour, appearance and texture were carried out. Colour and texture was evaluated by vision and touch sensation respectively. For odour evaluation a team of five odour sensitive persons were selected.

2.3.2 Physicochemical evaluation

a) pH

A standard single or double electrode pH meter used. Instrument shall be initially calibrated at pH 7 and 9.2 with appropriate buffer solution. The test sample consisting of 10 percent (m/v) dispersion of the product of either type of in previously boiled and cooled water shall be poured into a glass beaker and pH determined directly without any dilution within 5-10 minutes.

The pH was measured by using digital pH Meter.

b) Ash value

Total ash

Ash value is calculated to determine the inorganic contents which are characteristic for an herb. About 2 gm of face pack was taken in glass crucible dish previously ignited and weighed. Temperature was increased by gradually increasing the heat not exceeding to red colour. After complete burning, ash is cooled and weighed.

Acid insoluble ash

Acid insoluble ash was calculated by boiling above obtained ash with 25 ml dil. HCl for 5 min, insoluble matter was collected in crucible, washed with water, ignited and weighed.

c) Washability

Formulation were applied on the skin and then ease and extent of washing with water were checked manually.

d) General powder evaluation

General powder characteristics includes evaluation of those parameters which are going to affect the external properties (like flow properties, appearance, packaging criteria etc.) of the preparation, characteristics evaluated under this section are particle size, bulk density and tapped density.

1) 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.

2) 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 interparticulate void volume. Hence, the bulk density depends on both the density of powder particles and the spatial arrangement of particles in the powder bed. The bulk density is expressed in grams per millilitre (g/ml) although the international unit is kilogram per cubic metre ($1 \text{ g/ml} = 1000 \text{ kg/m}^3$) because the measurements are made using cylinders.

It may also be expressed in grams per cubic centimetre (g/cm^3).

The bulking properties of a powder are dependent upon the preparation, treatment and storage of the sample, i.e. how it was handled. The particles can be packed to have a range of bulk densities and, moreover, the slightest disturbance of the powder bed may result in a changed bulk density. Thus, the bulk density of a powder is often very difficult to measure with good reproducibility and in reporting the results, it is essential to specify how the determination was made.

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 measuring cylinder. 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.

Bulk Density = Mass/Volume

3) Tapped density

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

The tapped density is obtained by mechanically tapping a graduated measuring cylinder or vessel containing the powder sample. After observing the initial powder volume or mass, the measuring cylinder or vessel is mechanically tapped and volume or mass readings are taken until little further volume or mass change is observed.

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).

e) Antimicrobial evaluation

Formulation was tested for antibacterial activity against test organisms using modified agar well diffusion method. Aerobic bacteria: *Staphylococcus aureus* were obtained from the Microbial Type Culture Collection Centre. In this method, nutrient agar plates were seeded with 100µl of standardized bacterial suspension. After optimization of dose, 150 mg of formulation was mixed with distilled water and poured into the wells. Standard clindamycin (1% w/w) was used as positive control. The plates were then incubated at optimum temperature conditions and antibacterial activity was evaluated by measuring the diameter of zones of inhibition (mm). The result of evaluation are shown in following table number 3.^[12]

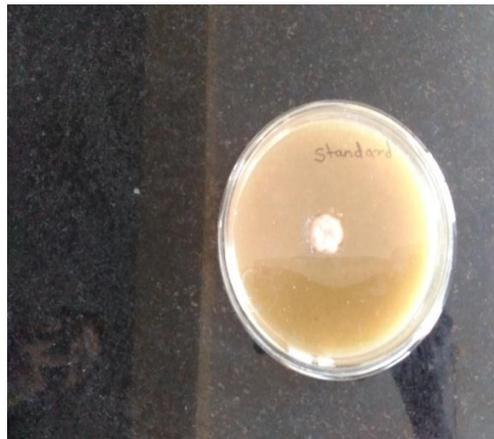
Table no. 3 Antimicrobial Evaluation of Face Pack

Sr. No	Samples	Zone of inhibition(mm)
		<i>Staphylococcus aureus</i>
1.	Clindamycin	15mm
2.	Herbal Anti-acne Face pack	10mm

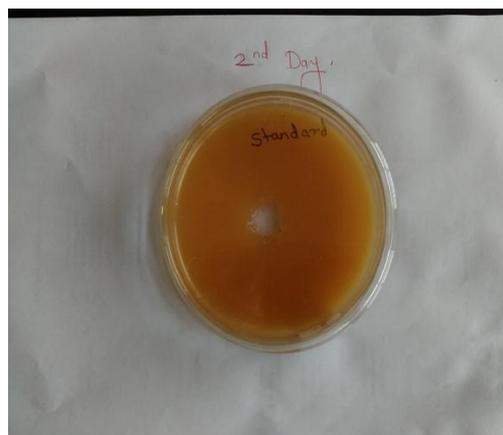
3. OBSERVATIONS



First day (face pack)



First day (standard)

**Second day (face pack)****Second day (standard)****Third day face pack (zone of inhibition)****Third day standard (zone of inhibition)**

4. 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 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 5.5%w/w total ash and 2%w/w acid insoluble ash. The pH of face pack was obtained as 7.20 which indicated that the powder of combined form were slightly alkaline in nature. Dried powder of combined form was evaluated for particle size, bulk density and tapped density before being formulated. Values of particle size, bulk density and tapped density obtained for powder of combined form were found to 25-30 μ m, 0.454g/cc and 0.675g/cc respectively. 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

Staphylococcus aureus, Zone of inhibition was found for clindamycin and formulation was displayed in Fig. 7 and table number 4.



Figure 7: Herbal anti-acne Face Pack

Table no. 4 Evaluation of Face Pack

Sr. No.	Evaluation parameters	Observations
A.	Organoleptic evaluation	
1.	Nature (appearance)	Powder
2.	Colour	Greenish yellow
3.	Odour	Slight
4.	Taste	Characteristic
5.	Texture	Fine
B.	Physicochemical Evaluation	
6.	Total ash	5.5% w/w
7.	Acid insoluble ash	2% w/w
8.	pH	7.2
C.	General Powder Characteristics	
9.	Particle size	25-30 μ m
10.	Bulk density	0.454g/cc
11.	Tapped density	0.675g/cc
12.	Washability	Easily washable
13.	Grittiness	No gritty particles were found when mixed with water
14.	Nature of face after wash	Soft and fresh, Clean from dirt

5. CONCLUSION

Herbal formulations are more acceptable in the belief that they are safer with fewer side effects than the synthetic ones.^[1] Herbs have growing demand in the world market. It is a very good attempt to establish the herbal anti-acne face pack containing different powders of materials. Thus in the present work found good properties for the face pack on human use as cosmetic product. Formulation showed good antimicrobial activity when compared to clindamycin and the results of formulation was very nearer compared to standard drug which clearly indicates that the prepared formulate face pack best suits for skin as cosmetic.

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