



INTERNATIONAL JOURNAL  
OF  
PHYTOPHARMACY RESEARCH  
www.phytopharmacyresearch.com

**FORMULATION AND EVALUATION OF HERBAL FACE PACK  
USING *SANTALUM ALBUM* AND *AZADIRACHTA INDICA***

**Deepika Bairagee\*, Priyanka Nagar and Sweta Kulkarni**

School of Pharmacy, Dr. APJ Abdul Kalam University, Indore, Madhya Pradesh, India.

**ABSTRACT**

The objective of this work is to formulate and evaluate a polyherbal face pack for glowing and acne free skin by using natural ingredients. With the varying quantity five different formulations containing neem powder, multani mitti, sandal wood powder, turmeric, almond powder and orange peel powder were prepared as F1 to F5. All prepared formulations were evaluated for its organoleptic, physico-chemical parameter and stability along with irritancy test and microbial load. Among formulation, F2 was found to be good in physical parameters, free from skin irritation maintained its consistency even after storage conditions and also having microbiological stability. The main advantage of herbal face pack is its non-toxic nature, reduce the allergic reactions and time tested usefulness of many ingredients used in it.

**Keywords:** Face Pack, Formulation, Evaluation, Stability, Powder.

**INTRODUCTION**

Herbs and products containing herbs have been in trade and commerce and are currently used for a variety of purpose. The WHO defines an herb as being fresh and dried, fragmented or powdered plant material, which can be used in this crude state or further processed and formulated to become the final herbal product. Face skin is the major part of body, which indicates the health of an individual [1, 2]. In ayurveda, the herbal paste is called as "mukha lepa" used for as a facial therapy. This herbal paste smeared on face to treat acne, scars, marks and pigments [3].

Face pack is the smooth powder which is used to apply on face. These preparations are applied on the face in the form of liquid or pastes and allowed to dry and set to form film giving tightening, strengthening and cleansing effect to the skin [4]. They are usually left on the skin for ten to twenty five minutes to allow all the water to evaporate, the resulting film thus contracts and hardens and can easily be removed. The warmth and tightening effect produced by application of face pack produces the stimulating sensation of a rejuvenated face, while the colloidal and adsorption clays used in these preparations remove the dirt and grease from the skin of the face. When the applied face pack is eventually removed skin debris and deposited dirt gets removed with it.

Herbal face packs help to reduce wrinkles, pimples, acne and dark circles. Also increase the fairness and smoothness of skin. It also helps someone to boost their confidence. Ayurveda is the most useful and

successful means for achieving this purpose [5]. Present research article deals with the formulation and evaluation of polyherbal face pack for glowing skin at home by using natural ingredients i.e., Multani mitti to treat pigmentation, sunburn, skin rashes and infections, turmeric for its anti-inflammatory, sandal wood for its anti-acne and glowing skin, orange peel for its anti-acne, anti-wrinkle and neem to treat acne, scars, pigmentation and black heads. Formulations were evaluated for physical parameters like color, odor, pH, consistency, patch test and stability studies for one month.

**MATERIALS AND METHODS**

All the natural materials used in the present study i.e., Multani mitti, Turmeric, Sandalwood, Orange peel, Neem were purchased from local market in a form of dried powder from Ujjain and were authenticated at Botany department, Ujjain. The details of the plant material used for the formulation of face pack are mentioned below;

**Multani mitti (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 [6].

Corresponding Author: **Deepika Bairagee Email:-** bairagee.deepika@gmail.com

### **Turmeric (*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 [7, 8].

### **Sandal wood (*Santalum alba*)**

Sandalwood has an anti-tanning and anti-aging property. It also helps skin in many ways like toning effect, emollient, antibacterial properties, cooling astringent property, soothing and healing property [9].

### **Orange peel (*Citrus reticulata*)**

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 [10].

### **Neem (*Azadirachta indica*)**

Neem is anti-inflammatory, antiseptic and highly beneficial for oily and acne prone skin.<sup>11</sup> An anti-acne effect is due to anti-microbial, anti-inflammatory and anti-oxidant activities of different chemical constituents [12].

### **Almond (*Prunus dulcis*):**

Almond protect skin from sun exposure, treat acne, blackheads, whiteheads and clear skin from impurities. It is having anti-oxidant properties which neutralize free radicals [13].

### **Methods of preparations**

Five different formulations were prepared with varying concentration of all ingredients named as F1 to F5. Concentration of each ingredient was mentioned in Table 1. The accurate quantity ingredients were weighed and ground into fine powder by using sieve #120. Then all ingredients were mixed geometrically by serial dilution method for uniform mixing. Then the prepared face pack was packed into a self-sealable polyethylene bag, labelled and used for further studies.

### **Procedure of face pack application**

Take prepared face pack powder in a bowl as per the requirement and add honey and rose water to mix. Mix well and apply over facial skin. Cover the acne and blemishes spots too. Kept as it is for complete drying for 20 to 25 min and then wash with cold water.

### **Methods of evaluation**

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

### **Organoleptic evaluation**

The organoleptic parameters include its nature,

colour, odour, feel and consistency which were evaluated manually for its physical properties.

### **Physical evaluation**

The particle size was tested by microscopy method. The flow property of the dried powder of combined form was evaluated by performing Angle of Repose by funnel method, bulk density and tapped density by tapping method.

### **Physicochemical evaluation**

Ash content was performed using incinerator, pH was found by using pH meter and loss on drying was also performed.

### **Irritancy test**

Mark on 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.

### **Stability studies**

Stability testing of prepared formulation was conducted for formulation F2 by storing at different temperature conditions for the period of one month. The packed glass vials of formulation stored at different temperature conditions viz., Room temperature, 35° C and 40° C and were evaluated for physical parameters like colour, odour, pH, consistency and feel.

### **Determination of microbial load**

The prepared formulation was evaluated for Total Viable Count, presence of gram negative pathogens such as E.coli, Salmonella and Pseudomonas.

## **RESULT AND DISCUSSION**

### **Physical parameters**

The different formulation of face pack was prepared and evaluated for physical parameters showed in the Table 2. The flow property parameter showed free flowing properties. The colours of formulations were different due to variation in composition of contents. Formulation F1, F2, and F4 were slightly yellow in color and formulation F3 and F5 showed as greenish yellow. The odor of prepared formulations was good acceptable which is desirable as cosmetic formulations. The particle size of formulations was in the range of  $20.25 \pm 2.25 \mu\text{m}$  to  $26.45 \pm 4.23 \mu\text{m}$ . The pH of all formulations lied near to neutral range i.e. in the range of 6 to 7 pH. The ash content and moisture content was within limit (Table 3).

### **Irritancy test**

The results of irritancy test were shown in Table 4. The formulations F3 and F5 showed mild irritation because of presence of neem powder. Formulation F2 showed no redness, edema, inflammation and irritation during irritancy studies. This formulation is safe to use for skin.

### Stability studies

The stability studies showed a slight change in pH of formulation which was stored at 40°C and no changes were observed at room temperature and at 35°C. The odour of formulation was slightly changed after one month of stability studies at 40°C and there was no change in colour and odour at other mentioned conditions of stability which were showed in Table 5.

### Determination of microbial load

The microbial load showed the Total Viable

Count (876 CFU/g), and the test for presence of gram negative pathogens such as E.coli, Salmonella and Pseudomonas absent per gram showed in Table 6.

The formulation F2 was found to be a good in physical parameters, free from skin irritation and maintained its consistency even after stressed storage conditions. It is suggested that the prepared formulation was physico-chemically and microbiologically stable, and possessed characteristics of a standard cosmeceuticals formulation for skincare.

**Table 1. Formulation of Face Pack**

Sr. No.	Name of Ingredients	Scientific Name	Quantity of sample for 100g				
			F1	F2	F3	F4	F5
1	Multani mitti	Calcium Bentonite	30	35	30	25	25
2	Neem	Azadirachta indica	25	25	30	25	30
3	Turmeric	Curcuma longa	3	3	3	3	3
4	Orange peel	Citrus reticulate	20	10	15	20	25
5	Sandal wood	Santalum alba	20	22	20	25	10
6	Almond	Prunus dulcis	2	5	2	2	7

**Table 2. Organoleptic Properties**

Sr. No.	Parameters	Observations				
		F1	F2	F3	F4	F5
1	Appearance	Powder	Powder	Powder	Powder	Powder
2	Colour	Slightly yellow	Slightly yellow	Greenish yellow	Slightly yellow	Greenish yellow
3	Odour	Slight	Slight	Slight	Slight	Slight
4	Texture	Fine	Fine	Fine	Fine	Fine
5	Smoothness	Smooth	Smooth	Smooth	Smooth	Smooth

**Table 3. Physical Parameter and Physicochemical Evaluation**

Sr. No.	Parameters	Observations				
		F1	F2	F3	F4	F5
1	Particle Size (µm)	22.50±2.43	20.25±2.25	25.75±3.22	23.82±2.20	26.45±4.23
2	Ash Content	91±0.234	85±0.954	92±0.745	90±0.456	93±0.657
3	pH	6.82±0.1	6.92±0.12	7.22±0.12	6.52±0.17	7.12±0.17
4	Loss on Drying	4.12	3.45	4.78	4.65	4.97

**Table 4. Irritancy Test**

Sr. No.	Parameters	Observations				
		F1	F2	F3	F4	F5
1	Irritant	No irritation	No irritation	Slight irritation	No irritation	Slight irritation
2	Erythema	Nil	Nil	Nil	Nil	Nil
3	Edema	Nil	Nil	Nil	Nil	Nil

**Table 5. Stability studies on formulation F2**

Sr. No.	Parameters	Observations (Formulations F2)		
		Room Temperature	35±0.5°C	40±0.5°C
1	Colour	No Change	No Change	No Change
2	Odour	No Change	No Change	Slight Change
3	Texture	Fine	Fine	Fine
4	Smoothness	Smooth	Smooth	Smooth
5	pH	6.92±0.12	6.95±0.1	6.98±0.15

**Table 6. Microbial Load of Formulation F2**

Sr. No.	Test	Observation
1	Total Viable Count (CFU/g)	876
2	Gram negative pathogens, CFU/g (E. Coli, Salmonella, Pseudomonas)	Absent

## CONCLUSION

Natural remedies are more acceptable in the belief that they are safer with fewer side effects than the synthetic ones. Herbal face packs are considered as sustaining and productive way to advance the appearance of skin. Thus in the present work, a very good attempt was made to formulate the herbal face pack containing naturally available ingredients like multani mitti, turmeric, sandalwood, orange peel, neem and almond powder. It is suggested that the prepared formulation was physico-

chemically and microbiologically stable, and possessed characteristics of a standard cosmeceuticals formulation for skincare.

## ACKNOWLEDGEMENT

Nil

## CONFLICT OF INTEREST

No Interest

## REFERENCES

1. Okereke JN, Udebuani AC, Ezeji EU, Obasi KO, Nnoli MC. Possible Health Implications Associated with Cosmetics: A Review. *Sci J Public Health*, 3(5-1), 2015, 58-63.
2. Mary PL. Antioxidants and Vitamins in Cosmetics. *Clin Dermatol*, 19, 2001, 467-473.
3. Millikan and Larry E. Cosmetology, Cosmetics, Cosmeceuticals: Definitions and Regulations. *Clin Dermatol*, 19(4), 2001, 371-374.
4. Rieger MM. Harry's Cosmeticology. In: Chapter 23, Face, Body & Hair Masks & Scrubs. 8th ed. vol I. New York: Chemical Publishing Co, 2009, 471-483.
5. Zinnia. Ayurvedic Face Packs for Glowing Skin. Style Craze, 2017.
6. Hwang JK, Shim JS, Gwon SH, Kwon YY, Oh HI, et al. Novel use of Panduratin derivatives or extract of *Kaempferia pandurata* comprising the same. U.S. Patent 0065272A1, 2012.
7. Michelle OS. Turmeric is an effective homemade face pack ingredient to help open pores, 2016.
8. Best Benefits of Turmeric (Haldi) For Skin, Hair, And Health-No.4 Is The Best Nov 2016.
9. Nemade CT and Baste N. Formulation and evaluation of a herbal facial scrub. *World J Pharm Res*, 3(3), 2014, 4367- 4371.
10. Himaja N, Ashok kumar A, Bhart kumar B. Preparation and Evaluation of Poly Herbal Fruit Face Mask. *J Res Pharm Sci*, 2(11), 2015, 07-13.
11. Koli DS, Mane AN, Kumbhar VM, Shaha KS. Formulation & Evaluation of Herbal Anti-Acne Face Wash. *World J Pharm Pharm Sci*, 5(6), 2016, 2001-2007.
12. Yamini K and Onesimus T. Preparation and Evaluation of Herbal Anti-Acne Gel. *Int J Pharm Bio Sc*, 4(2), 2013, 956 – 960.
13. Zohary D and Maria H. Domestication of plants in the old world: the origin and spread of cultivated plants in West Asia, Europe, and the Nile Valley. Oxford University Press, 186