

Formulation Of Polyherbal Face Pack with Antimicrobial Activity

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Abstract—The objective of this work is to formulate and evaluate a cosmetic herbal face pack for glowing skin by using natural ingredients. [5] With the varying concentrations, four different formulations containing ingredients such as flax seeds, rosemary essential oil, aloe vera and almond oil; were prepared named as F1 to F4. All prepared formulations were evaluated by different parameters like organoleptic properties and physico-chemical parameters and stability along with irritancy test and microbial load.[17] Among all formulation, F2 was found to be good in physical parameters, free from skin irritation and maintained its consistency even after stability storage conditions and also having microbiological stability.[20]

Index Terms—Cosmetic, Evaluation, Face pack, Formulation, Natural.

I. INTRODUCTION:

Cosmetics are commercially available products that are used to improve the appearance of the skin by action of cleansing, beautifying, promoting attractiveness. From the ancient time, different herbs are used for cleaning, beautifying and to manage them. [1] Face skin is the major part of the body, which indicates the health of an individual. It consists of materials such as amino acids, lipids and carbohydrates etc. [2,3] So that a balanced nutrition is required for the skin to keep it clear, glossy and healthy. In Ayurveda, the herbal paste is called as "mukha lepa" used for as a facial therapy. [4] This herbal paste is eared on face to treat acne, pimple, scars, marks and pigment. Face pack is the smooth powder which is used for facial application. [5] These preparations are applied on the face in the form of liquid or pastes and allowed to dry and set in form of

film giving tightening, strengthening and cleansing effect to the skin. They are usually left on the skin for 10 to 25 min to allow all the water to evaporate, the resulting film thus contracts and hardens and can easily be removed. [6,8]. 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. [9] When the applied face pack is eventually removed skin debris and deposited dirt gets removed with it. Face packs are basically additives delivering some additional benefits. [10] Different types of herbal face packs are used for different types of skin. Herbal face packs are helps to reduce wrinkles, pimples, acne and dark circles. Also increase the fairness and smoothness of skin. It also helps someone to boost fairness and their confidence. [11,12] Ayurveda is the most useful and successful means for achieving this purpose. [13]

These packs are available in various types and forms and broadly classified into the following categories:

1. Plastic masks: Wax based, latex based, or vinyl based
2. Hydrocolloid masks: Gel masks (ready to use)
3. Argillaceous masks: Clay based or earth based (ready to use or dry powder)

Present research deals with formulation evaluation of cosmetic herbal face pack for glowing skin at home by using natural materials i.e., flax seeds, rosemary oil, almond oil and aloe vera.

II. MATERIALS AND METHODS

All the natural materials used in the present study i.e.,

flax seeds, rosemary oil, almond oil, vitamin E and aloe vera were purchased from local market, in a form of dried powder and were authenticated. The details of the plant material used for the formulation of face pack are mentioned below.

A. Flax seed: (*Linum usitatissimum*)

Flax seeds offers various skin benefits due to their rich in omega -3 fatty acids, antioxidants, and other nutrients, which can help with hydration, reducing inflammation, anti - aging, improved skin elasticity, acne management, skin brightening, natural exfoliant, soothing irritated skin. [15,18]



Fig no. 01 *Linum usitatissimum*

B. Rosemary oil: (*Rosemarinus officinalis*)

Rosemary oil, with its potent antioxidant and antimicrobial properties. can benefit skin by reducing inflammation, improving circulation, tightening and firming, natural healing, cleansing and clarifying and potentially aiding in acne treatment and skin tone enhancement. [14,16]



Fig no.2 *Rosemarinus officinalis*

C. Aloe vera: (*Aleo barbadensis miller*)

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, sorbito, etc. [8,12,19]



Fig no.03 *Aleo barbadensis miller*

D. Almond oil: (*Prunus Amydalus*)

Almond oil offers various skin benefits, including moisturizing, soothing, and potentially reducing the appearance of scars and stretch marks, reduces dark circles, cleansing and makeup removal, soothing sunburns, protects from sun damage, improve skin tone and complexion because it is rich in vitamin A and E. [8,11]



Fig no.04 *Prunus Amydalus*

E. Vitamin E: (*Tocopherols*)

Vitamin E also known as tocopherols, is a natural antioxidant that can be used in the various formulations as preservatives [17].

a. Methods of Preparation

Four different formulations were prepared with varying concentrations of all ingredients named as F1 to F5 wse. accurate quantity ingredients were weighed and taken accurately. Then the all ingredients were mixed geometrically by serial dilution method for uniform mixing. Then the prepared face pack was packed into a suitable container labeled and used for further studies [17,20].

b. Procedure of Face Pack Application

Take prepared face pack gel on hand as per the requirement. Mix well and apply over the 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 [17,22].

c. Methods of Evaluation [26]

Following evaluation parameters were performed to ensure superiority of prepared face pack [17].

i. Organoleptic Evaluation

The organoleptic parameters include its nature, color, odor, feel and consistency which were evaluated manually for its physical properties. [20]

ii. Physical Evaluation

The physical evaluation of herbal face pack in gel forms include their appearance, texture, spreadability and wash ability which ensuring they are suitable for skin application and free from irritation was performed

manually. [17]

iii. Physicochemical Evaluation

Ash content was performed using incinerator, pH was found by using pH meter and loss on drying was also performed. [27]

iv. 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. [28]

v. 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 Color, Odor, pH, Consistency and feel.20 [26]

vi. 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 by streak plate method. [24]

- Formula for Preparation of Herbal face pack

Table No. 01 Formula of Herbal face pack

Sr.no	Name of Ingredient	Biological Name	F1	F2	F3	F4	F5
1	Flax Seed	<i>Linum usitatissimum</i>	30	35	20	25	40
2	Rosemary oil	<i>Rosemarinus officinalis</i>	5	3	2.5	5	2.5
3	Almond oil	<i>Prunus Amydalus</i>	5	5	2.5	5	2.5
4	Aleo vera	<i>Aloe barbadensis miller</i>	10	7	25	15	5
5	Vitamin E	Tocopherol	QS	QS	QS	QS	QS

III. RESULT AND DISCUSSION

i. Organoleptic properties:

Table No. 02 Organoleptic properties

Sr.no	Physical Character	F1	F2	F3	F4	F5
1	Colour	White	Yellow	Light Green	Yellowish green	Green
2	Odor	Characteristic	Charasteristic	Characteristic	Characteristic	Characteristic
3	Texture	Soft	Soft	Soft	Soft	Soft
4	Appearance	Jelly	Jelly	Jelly	Jelly	Jelly
5	Characteristic	soft	Soft	Soft	Soft	Soft

ii. Physicochemical Evaluation:

Table no.03 Physicochemical Evaluation

Sr.no	Physical Character	F1	F2	F3	F4	F5
1	pH	6.92	6.06	5.97	7.75	7.32
2	Particle size (μm)	24.3 $\pm$ 2.5	26.6 $\pm$ 4.5	20.5 $\pm$ 2.5	26.4 $\pm$ 7.6	28.7 $\pm$ 8.9
3	Ash content	89 $\pm$ 0.352	91 $\pm$ 0.657	83 $\pm$ 0.789	98 $\pm$ 0.877	94 $\pm$ 0.976
4	Loss on Drying	2.9	3.3	2.2	2.7	2.5

iii. Stability studies for formulation:

Table No. 04 Stability studies for formulation

Sr.no	Physical Character	Room Temp. 34 ⁰ C - 40 ⁰ C +5 ⁰ C				
		F1	F2	F3	F4	F5
1	Colour	Change	Change	No change	Change	Change
2	Odor	Change	Change	No change	Change	Change
3	Texture	Greety	Soft	Soft	Soft	Soft
4	pH	6.42	6.87	5.97	7.89	7.54

iv. Irritancy test:

Table No. 05 Irritancy test

Sr.no	Irritancy test	F1	F2	F3	F4	F5
1	Irritation	Mild	Mild	No	Moderate	Moderate
2	Redness	No	Mild	No	Moderate	Slight
3	Swelling	No	No	No	Mild	Slight
4	Edema	No	No	No	Mild	Slight

v. Washability test:

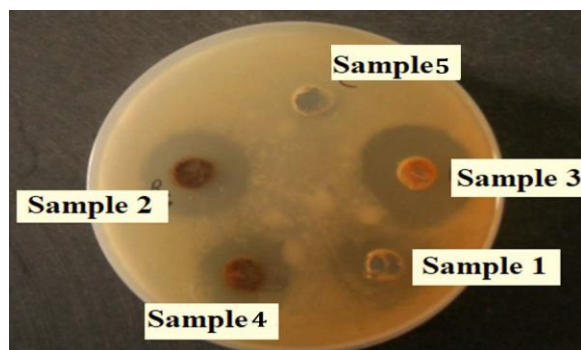
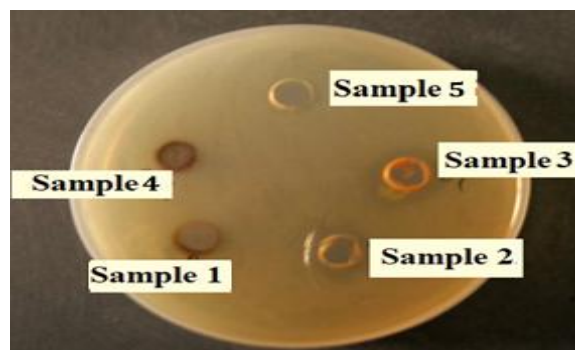
Table No. 06 Washability test

Sr.no	Irritancy test	F1	F2	F3	F4	F5
1	Wash ability	Washable	Washable	Washable	Washable	Washable

vi. Microbial load:

Table No. 07 Microbial load

Sr.no	Physical Character	F1	F2	F3	F4	F5	Std
1	Gram Negtive pathogen (CFU/gm) <i>Escherichia coli</i>	1.3cm	2.4cm	3.4cm	1.7cm	0.8cm	2.12cm
2	Gram Positive pathogen (CFU/gm) <i>Staphylococcus aureus</i>	0.8cm	0.9cm	1.2cm	0.5cm	0.5cm	4.67cm

Fig no.05 Antibacterial activity in terms of Zone of inhibition in mm (*Staphylococcus aureus*)Fig no.06 Antibacterial activity in terms of Zone of inhibition in mm (*Escherichia coli*)

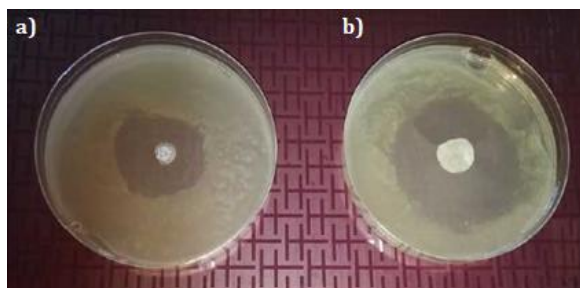


Fig no.07 Antibacterial activity in terms of Zone of inhibition in mm standard Compound- Antibiotics
a) *Escherichia coli* and b) *Staphylococcus aureus*

a. 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 flow property parameter showed free flowing properties. The composition of contents. Formulation F1, F2, F4 and F5 were slightly yellow in color and formulation F3 showed as greenish yellow. The odor of prepared formulations was good acceptable which is desirable as cosmetic formulations. The particle size of which is desirable as cosmetic formulations. 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 are within limit.

b. Irritancy test:

The results of irritancy test were shown in Table 5. The formulations F1, F2, F4 and F5 showed mild irritation because of presence of flax seeds. The formulations which were prepared by lowering the concentration of flax seed i.e., formulations F3 showed no redness, edema, Inflammation and irritation during irritancy studies. This formulation is safe to use for skin.

c. Stability test:

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 color and odour at other mentioned conditions of stability which were showed in Table.4.

d. Determination of Microbial Load:

The microbial load showed the Total Viable Count (867 CFU/g), and the test for presence of gram-

negative pathogens such as *E. coli*, *Salmonella* and *Pseudomonas* absent per gram showed in Table 7. The Formulation F3 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 cosmeceutical's formulation for skincare.

IV. CONCLUSION

In the present scenario, people need cure for various skin problems without side effects. Herbal ingredients opened the way to formulate cosmetics without any harmful effect. Herbal face packs are considered as sustaining and productive way to face packs are considered as advance the appearance of skin. Thus, in the present work, it is a very good attempt to formulate the herbal face pack containing naturally available ingredients like flax seeds, rosemary oil, almond oil, aloe vera and vit E. It is suggested that the prepared formulation was physico-chemically and microbiologically stable, and possessed characteristics of a standard cosmeceutical's formulation for skincare.

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