

FORMULATION AND EVALUATION OF HERBAL FACE SHEET MASK

Anajli A. Sirsat, Avantika N. Watane*, Anurdha P. Dukare, Ayush R. Mhaisgawli, Dr. Vikrant Salode Sir

P.R. Patil Institute of Pharmacy, Talegaon (S.P.) Wardha, INDIA.

***Corresponding Author: Avantika N. Watane**

P.R. Patil Institute of Pharmacy, Talegaon (S.P.) Wardha, INDIA.

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ABSTRACT

The growing preference for natural and skin-friendly cosmetic products has increased the interest in herbal sheet masks as an alternative to synthetic skincare formulations. The present study involved the formulation and evaluation of a polyherbal face sheet mask containing aloe vera gel, dragon fruit extract, carrot extract, licorice extract, orange powder, glycerin, vitamin E, rosemary oil, and Rose water. The formulation was prepared within a skin-compatible pH range of 5.10. The selected herbal ingredients were incorporated for their antioxidant, moisturizing, soothing, skin-brightening, and rejuvenating properties. Aloe vera provided hydration and soothing action, while dragon fruit extract contributed antioxidant activity. Licorice extract was included for depigmenting effect, carrot extract for skin renewal, and orange powder for natural vitamin C activity. Glycerin acted as a humectant, vitamin E as an antioxidant stabilizer, and rosemary oil improved skin conditioning. The prepared formulation was evaluated for physicochemical parameters including appearance, pH, homogeneity, spreadability, stability, and skin irritancy. The formulation showed satisfactory homogeneity, suitable consistency, stable pH, and good spreadability without causing skin irritation. The developed herbal sheet mask demonstrated effective moisturizing and skin-softening properties, indicating its potential as a safe and effective herbal cosmetic formulation.

KEYWORDS: Herbal face sheet mask, Licorice extract, Dragon fruit Extract, Depigmentation, Anti-aging effect.**INTRODUCTION**

"Any plant which has leaves, stem, flowers, roots, and seeds; used for different purposes like flavoring, food, medicine, or perfume" is the definition of a herb. According to botany, a herb is any seed-bearing plant that dies to the ground after flowering or completing its life cycle and lacks a woody stem. Herbs are therefore seasonal plants based on the Oxford Dictionary. "Any plant with leaves, seeds, or flowers used for flavoring, food, medicine, or perfume is a herb". In daily life, plants used as food, spices, and fragrances are also regarded as herbs.^[1,8,11]

Herbal cosmetics are plant-derived ingredients that provide therapeutic and skin-enhancing benefits with few side effects, herbal cosmetics are becoming more and more popular. The current formulation uses natural ingredients like orange powder for vitamin C-mediated brightening, licorice extract for depigmentation, carrot extract for skin renewal, dragon fruit extract for

antioxidant and anti-aging effects, and aloe vera for hydration and soothing. Vitamin E offers antioxidant stability, glycerine functions as a humectant, and rosemary oil gives skin conditioning and a subtle scent. These formulas promote safer, nutrient-rich, and efficient skincare products while avoiding harsh synthetic chemicals.^[9,12]

Herbal face masks, formulated using natural ingredients such as herbs, fruits, and botanicals, offer a gentle and sustainable approach to skincare. They provide benefits including anti-inflammatory effects, hydration, exfoliation, and reduction of hyperpigmentation. However, their formulation presents challenges such as maintaining consistency and stability of raw materials, preventing ingredient incompatibility and degradation, achieving suitable texture, and ensuring safety with low allergenic potential. Recent advancements aim to address these formulation challenges.^[12,13]

Advantages of Herbal Cosmetics

a) Natural Products

Herbal cosmetics are made from natural ingredients obtained from plants. They do not contain harmful synthetic chemicals that can damage the skin. These products include plant extracts and natural nutrients like vitamins and minerals, which help keep the skin healthy, glowing, and smooth.^[9]

b) Safe and Effective

Compared to many chemical-based beauty products, herbal cosmetics are generally safer and effective. They are usually mild on the skin and less likely to cause allergies. Because they are made from natural ingredients, the chances of irritation, rashes, or itching are reduced.^[9]

c) Suitable for All Skin Types

Herbal cosmetics can be used by people with different skin types, such as dry, oily, or sensitive skin. They are gentle and do not usually worsen skin conditions.^[9]

d) Not Tested on Animals

Most herbal cosmetic products are developed without animal testing. They are tested using modern laboratory methods, making them more ethical and cruelty-free.^[9]

e) Fewer Side Effects

Unlike synthetic products, which may cause irritation or long-term skin problems, herbal cosmetics are less likely to harm the skin. They do not contain harmful substances like parabens and are less likely to clog pores or disturb the natural balance of the skin.^[9]

f) Wide Variety

There is a large range of herbal cosmetic products available, including skincare and haircare items, offering many choices to users.^[9]

g) Affordable

Herbal cosmetics are generally cost-effective and easily available, making them accessible to a wide range of people.^[9]

Human Skin

The skin is the largest organ of the human body, covering about 20 square feet. The skin consists of three main layers: the epidermis (outer layer) that provides a protective barrier and determines skin tone, the dermis (middle layer) containing connective tissue, hair follicles, and sweat glands, and the subcutaneous layer (hypodermis), which is made up of fat and connective tissue. Skin color is produced by melanin, which is synthesized by melanocytes in the epidermis.^[7,14]

Functions of Skin^[7]

- It contributes to thermoregulation by liberating sweat, on surface and by adjusting the flow of blood in the dermis.

- It also serves as blood reservoir where dermis house and extensive network of blood vessels that carry 8-10% of total blood in resting adult.
- It serves as medium of sensation, including tactile sensation touch, pressure, vibration and tickling as well as thermal sensation such as warmth and coolness and also sensation of pain
- It excretes sodium chloride and metabolites like urea.
- It also helps in maintaining water and electrolyte balance.
- It helps in synthesis of vitamin d from ergosterol of skin by action of UV rays of sunlight.
- It synthesizes melanin from tyrosine.
- It secretes sweat and sebum which keep the skin soft.
- It stores fat, water, chlorides and sugar

HERBAL FACE SHEET MASK

The ability of sheet masks to hydrate the skin, eliminate excess oil and pollutants, and enhance the appearance of pores has made them popular for skincare. They are inexpensive, readily available, and usually composed of materials like cellulose or microfiber. Natural ingredient-based products are becoming more popular as people become more conscious of environmental issues. Because of their many uses, including antioxidant activity, plant extracts are being used more and more in pharmaceutical and cosmetic products.^[8]

Concept of Beauty in Ayurveda

According to Ayurveda, beauty is not gender-specific but rather a reflection of general health and well-being. Ayurvedic literature has a long history of using herbal remedies for aesthetic purposes. Maharishi Ayurveda states that healthy internal processes like liver activity, blood purity, a balanced body temperature, sufficient hydration, and effective digestion are necessary for glowing skin. Sara (tissue quality), Prakriti (body constitution), Samhanana (body compactness), Pramana (body proportions), Twaka (skin complexion), and Dirghayu Lakshana (signs of longevity) are some of the Ayurvedic criteria used to assess beauty.^[8]

SELECTING THE RIGHT FACE MASK SHEET

A. Anti-Aging Sheet Masks

Combat signs of aging with masks often containing ingredients like collagen and peptides.^[8]

B. Brightening Sheet Masks

Achieve a radiant complexion with brightening sheet masks enriched with ingredients like vitamin.^[8]

C. Hydrating Sheet Masks

If your skin craves moisture, these masks offer a deep hydration boost.^[8]

D. Soothing Sheet Masks

Soothing sheet masks provide relief from redness and irritation.^[8]

E. Acne-Fighting Sheet Mask

Acne-fighting sheet masks commonly contain salicylic acid to reduce breakouts.^[8]

Advantages of Herbal Mask Sheet**A. Deep Cleansing**

Effectively removes dirt, oil, makeup, and hidden impurities from the skin surface and pores.^[8]

B. Impurity Removal & Skin Refreshing

Helps detoxify the skin and provides a relaxing, spa-like effect at home while improving skin appearance.^[8]

C. Unclogs Pores

Absorbs excess oil, removes dead skin cells, and reduces pore blockage, making pores look tighter.^[8]

D. Improves Skin Health

Enhances blood circulation, supports better skin tone, and gives a healthier overall look.^[8]

E. Instant Glow

Provides quick hydration and nourishment, resulting in brighter and smoother skin.^[8]

PLANT PROFILE**1. Dragon Fruit**

General description: Tropical fruit with red/pink peel and white or red pulp rich in antioxidants

Synonyms: Pitaya, Pitahaya

Biological source: Fruit of *Hylocereus undatus*

Family: Cactaceae

Chemical constituents: Betalains → anti-aging,

Geographical source: Mexico, Central America, India.

Uses: Hydration, anti-aging, improves skin radiance

2. Carrot

General description: Root vegetable rich in carotenoids

Synonyms: *Daucus carota*, Gajar

Biological source: Root of *Daucus carota*

Family: Apiaceae

Chemical constituents

β -carotene → skin repair

Geographical source: Worldwide (India, China, Europe)

Uses: Skin rejuvenation, glow enhancement, anti-wrinkle

3. Licorice Root

General description: Sweet-tasting medicinal root

Synonyms: Mulethi, Yashtimadhu

Biological source: Root of *Glycyrrhiza glabra*

Family: Fabaceae

Chemical constituents: Glabridin → reduces pigmentation

Geographical source: Mediterranean, Asia, India

Uses: Brightening, anti-inflammatory, reduces dark spots

Benefits of Herbal Mask Sheet**I. Hydration**

Provides deep moisture to dry skin, improves elasticity, and makes skin soft and plump.^[8]

II. Detoxification

Removes dirt, oil, sweat, and environmental pollutants, helping to cleanse clogged pores.^[8]

III. Brightening Effect

Reduces dullness caused by pollution and stress, restoring natural glow and improving skin radiance.^[8]

IV. Suitable for All Skin Types

Available in different formulations to meet the needs of oily, dry, and combination skin.^[8]

V. Quick Skin Care Solution

Easy to use and delivers fast visible results like freshness and glow.^[8]

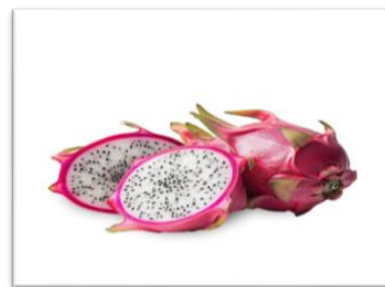


Fig. 1: Dragon fruit.^[31]



Fig. 2: Carrot.^[32]



Fig. 3: Licorice root.^[36]

4. Orange Peel Powder

General description: Dried powdered peel of orange fruit

Synonyms: Citrus peel powder

Biological source: Peel of *Citrus sinensis*

Family: Rutaceae

Chemical constituents: Vitamin C → skin brightening

Geographical source: Worldwide (India, Brazil, USA)



Fig. 4: Orange peel powder.^[33]

5. Aloe Vera

General description: Succulent plant with gel-filled leaves

Synonyms: *Aloe barbadensis*

Biological source: Leaf gel of Aloe vera

Family: Asphodelaceae

Chemical constituents: Aloin → healing

Geographical source: Africa, India, tropical regions

Uses: Moisturizing, soothing, wound healing



Fig. 5: Aloe Vera.

6. Rosemary Oil

General description: Essential oil obtained from aromatic herb

Synonyms: *Rosmarinus officinalis* oil

Biological source: Leaves of *Rosmarinus officinalis*

Family: Lamiaceae

Chemical constituents:

Rosmarinic acid → antioxidant

Geographical source: Mediterranean region

Uses: Antimicrobial, improves skin tone, reduces acne



Fig. 6: Rosemary Oil.^[35]

The primary aim of the present study is to formulate and evaluate a herbal face sheet mask using natural ingredients with proven skin-beneficial properties. The objective is to develop a safe, effective, and cost-efficient cosmetic formulation that provides multiple skin benefits such as hydration, nourishment, antioxidant protection, and improvement in overall skin appearance. The study also focuses on selecting suitable herbal components based on their functional roles, preparing a stable formulation, and evaluating it using appropriate physicochemical and performance parameters. Additionally, the research aims to assess the potential of herbal ingredients as alternatives to synthetic chemicals

in skincare products, thereby enhancing safety and minimizing adverse effects.

MATERIAL AND METHOD

Instrument and its uses

Various type of instrument used in preparation of Herbal Facial sheet Mask listed below

Table 1: List of Instruments.

SR.NO	INSTRUMENTS	USES
1.	Heating mantle	Heating
2.	Weight balance	Weight
3.	pH meter	Measurement of pH

Material and its role/importance

Various ingredients used in the preparation of Herbal Facial Sheet Mask listed below:

R.NO	INGREDIENTS	QUANTITY	ROLE
1.	Dragon fruit extract	8 ml	Anti aging effect
2.	Carrot extract	4ml	Skin rejuvenation
3.	Orange peel powder	2 gm	Tan removal
4.	Licorice extract	0.75 ml	Depigmenting effect
5.	Glycerine	1 ml	Humectant
6.	Vitamin E	0.15 gm	Improve skin barrier
7.	Rosemary oil	1 ml	Skin toning

8.	Rose water	10 ml	Solvent / Perfume
9.	Aloe vera gel	11 ml	Moisturizer
10.	Sodium Benzoate	0.076 gm	Preservative

METHODOLOGY

1. Extraction of Dragon Fruit

- Take required amount of coarse powder of dragon fruit.
- Then soaked in ethanol for 24–48 hours with occasional shaking.

- The extract was filtered using muslin cloth and filter paper.
- The filtrate was concentrated and stored for further use.



2. Extraction of licorice

- Dried licorice roots were powdered and packed in a thimble.
- The thimble was placed in a Soxhlet apparatus containing ethanol as solvent.

- Continuous heating was carried out for complete extraction.
- The extract obtained was concentrated by evaporating the solvent.
- The final extract was stored in an airtight container.



3. Extraction of carrot

- Take required amount of coarse powder of Carrot.
- Then soaked in ethanol for 24–48 hours with occasional shaking.

- The extract was filtered using muslin cloth and filter paper.
- The filtrate was concentrated and stored for further use.



4. Extraction of Aloe vera gel

- Fresh aloe vera leaves were washed thoroughly with water.
- The thorny edges were removed and the leaf was cut longitudinally.
- The inner transparent gel was collected by scraping.

- The gel was homogenized to obtain smooth consistency.
- The prepared gel was stored in a clean airtight container.



5. Procedure of herbal face sheet mask

(A) Mixture of A

Take dragon fruit extract, licorice extract, and carrot extract into a beaker, licorice extract and carrot extract into the beaker.

Weigh all ingredients (Aloe-vera gel, Rosemary oil, Glycerin, Vitamin-E) and mix them in a beaker.

(B) Mixture of B

- Pour the mixture B into mixture A very slowly and mix it well to make the serum.
- Then dip a mask sheet into serum.
- Pack a face mask sheet in the air tight aluminium sachet with label
- Herbal face mask sheet was ready to apply.



Mixture A



Mixture B



Mix both mixtures A&B



Dip mask into serum, pack & label

EVALUATION PARAMETERS

1. Organoleptic property

The organoleptic test is carried out to see the physical appearance of the essence by observing changes in the shape, smell and colour of the essence that has been made before and during cycling test.^[8]



Fig. 7: Serum.

2. pH determination

Determination of the pH of preparation is done by using a pH meter. The pH test was carried out before and during cycling test.^[8]



Fig. 8: pH of serum.

3. Irritability

A small amount of serum was applied on the skin and kept it for few minutes and found to be non-irritated.^[8]



Fig. 9: After Applied Serum.

4. Determination of Homogeneity

This test was carried out using 2 object glass, 2-3 drops of the preparation are smeared on a piece of object glass covered by another glass. The preparation must show a homogeneous arrangement and no coarse grains are visible. This homogeneity test was carried out before and during cycling test.^[8]



Fig. 10: Homogeneity of serum.

5. Spreadability test

The Spreadability of serum is crucial for its behavior on the skin. A small sample was placed on a watch glass, and another glass was placed above it.^[8]

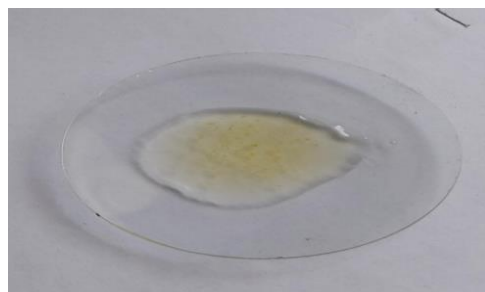


Fig. 11: Spreadability of serum.

RESULT AND DISCUSSION

The prepared herbal sheet face mask was evaluated for parameters including appearance, colour, odour, pH, consistency, spreadability, irritancy, and homogeneity. The formulation showed satisfactory characteristics in all tests, indicating its suitability and effectiveness for cosmetic application.

SR.NO	PARAMETER	FORMULATION
31.	Colour	Yellowish
2.	Odour	Aroma
3.	Consistency	Liquid
4.	pH	5.10
5.	Irritability	Non-irritant
6.	Homogeneity	Good

SUMMARY AND CONCLUSION

This study focused on the formulation and evaluation of a herbal sheet mask using plant-based ingredients with multifunctional skin benefits. The formulation incorporated aloe vera, dragon fruit extract, licorice

extract, carrot extract, and orange powder, supported by glycerine, vitamin E, rosemary oil, and Rose water. These ingredients were selected for their combined antioxidant, depigmenting, moisturizing, and anti-aging properties.

The prepared formulation was evaluated for key physicochemical parameters including pH, homogeneity, spreadability, and appearance, along with stability and skin irritation assessment. The results indicated that the formulation possessed suitable pH (5.10), good consistency, and uniformity. Stability studies showed no significant changes, and patch testing confirmed the formulation to be non-irritant. The sheet mask demonstrated effective hydration and improved skin texture upon application, supporting its functional performance as a topical cosmetic product.

The developed herbal sheet mask formulation proved to be stable, safe, and effective for topical application. Its composition of natural bioactive ingredients offers significant benefits such as skin hydration, depigmentation, and antioxidant protection, making it a promising alternative to synthetic cosmetic products. However, the current findings are limited to preliminary evaluation; therefore, extensive clinical studies and long-term stability assessments are required to substantiate its efficacy and support large-scale commercialization.

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34. Picture of aloe -
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35. Picture of rosemary oil -
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36. Picture of Licorice root -
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