



Formulation and Evaluation of Multi-Herb Peel Off Mask

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ABSTRACT

Herbal cosmetics are deeply rooted in ancient practices to enhance beauty and minimize skin problems like acne, pigmentation, dryness, wrinkles, etc. These products offer a spectrum of physiological benefits, including anti-acne, brightening, anti-inflammatory, moisturizing, antioxidant and anti-aging properties, all while minimizing adverse reactions. Herbal formulations have gained widespread global appeal. Time-tested Indian herbs like Turmeric, Fenugreek, saffron; Neem, sandalwood, etc. have been integral part of skincare rituals for centuries. Fenugreek is known for its anti-aging properties and is used to reduce blemishes and dark circles. Neem is known for its anti-fungal characteristics and aid in the lightening of acne scars. Saffron is used for skin brightening and skin moisturizing. Turmeric is used as an anti-inflammatory and antioxidant. In this research, multiple herbs are used for the formulation of peel-off mask. The extract of fenugreek, neem, turmeric and saffron were used and evaluation parameter has been performed to meet the requirements of ideal peel-off mask formulation. Feedback was taken from 50 volunteers. The prepared herbal peel-off mask has neutral PH and is non-irritant, Stability test was performed. The multi-herbal mask will have ability to deeply cleanse, minimize pores, and rejuvenate the skin, leaving behind a residue-free elastic membrane.

Keywords: Multiherb Peel of mask, Fenugreek, saffron, Neem, Anti-acne.

INTRODUCTION

Herbal cosmetics are beauty products that derive their desirable physiological effects, such as brightening, anti-inflammatory, hydration, nourishment, and anti-aging properties, from herbal ingredients. These herbal cosmetics serve to protect and enhance the skin.

A peel-off mask is typically preparation that spread over the face as a thin layer using the fingers or spatula. Once it completely dried, the liquid film peels off from the face, leaving behind a thin, plasticized film without any residue. It effectively deep cleans pores, removes skin impurities, and tightens, rejuvenates, and heals facial skin. Additionally, peel-off masks may provide slight moisturization while enhancing the occlusive effect, which promotes increased blood flow, activates skin cells, and facilitates impurity removal.

Acne is a prevalent and persistent inflammatory skin issue that targets the sebaceous glands. It commonly arises during adolescence and troubles individuals aged 12 to 25. According to the Global Burden of Disease report, around 85% of teenagers and young adults encounter acne vulgaris¹. Acne frequently originates from bacterial presence on the skin's surface, with Propionibacterium acnes and Staphylococcus epidermidis being prevalent microbes found in acne lesions. These microorganisms significantly contribute to the development of acne. Research has shown that both P. acnes and S. epidermidis exhibit resistance to multiple antibiotics. In Indonesia,

traditional practices have long utilized natural plant remedies to address various health concerns, including acne treatment². A commonly chosen method for improving facial-skin is a peel-off face mask gel, often employed as a topical skincare treatment. One advantage of this mask is its elastic membrane, making it easy to remove. This gel mask is known for minimizing pores and aiding in the healing, treatment, and rejuvenation of facial skin. Additionally, it serves as a cleanser, refresher, and can contribute to relaxing facial muscles³.

MATERIALS AND METHODS

Plant material refers to the substances utilized in the formulation. i.e. Fenugreek, neem, turmeric, saffron were extracted from plant source and some ingredients were purchased from local market⁴. The ingredients used for the formulation of peel of mask are mentioned below;

i) Fenugreek extract: fenugreek extract was prepared at the laboratory of the K.B.H.S.S Trusts Institute of Pharmacy in Malegaon, Nashik in January 2024. Fenugreek is known for its effectiveness in treating oily skin and reducing acne. The extraction process involved maceration, where 5 grams of fenugreek was combined with 50 milliliters of ethanol and macerated for 4-5 days⁵. As mentioned in table no 1.

Fenugreek extract serves multiple functions within a peel-off mask formulation. It acts as a natural exfoliant, aiding in the removal of dead skin cells and the clearing of pores. Moreover, fenugreek extract contains antioxidants and anti-inflammatory properties, which contribute to



soothing and calming the skin. Its antimicrobial characteristics may also aid in diminishing acne and blemishes, fenugreek extract can contribute to the overall brightening and rejuvenating effect of the peel-off mask, leaving the skin looking refreshed and radiant ⁶

ii) Neem extract: The neem powder was purchased from the local market and subsequently subjected to an extraction process using maceration. This method entailed combining five grams of neem with 50 milliliters of ethanol and macerate for 4-5 days. Neem is renowned for its skin-purifying properties, aiding in the reduction of spots and promoting well-hydrated, blemish-free skin⁷. As mentioned in table no 1.

Neem extract offers many benefits when incorporated into a peel-off mask formulation. Well-known for its antibacterial and antifungal attributes, neem extract is effective in combating acne-causing bacteria and minimizing inflammation, making it a valuable option for addressing blemish-prone skin. Furthermore, neem extract boasts antioxidant qualities, aiding in shielding the skin from environmental harm and premature aging. Its astringent properties help to tighten pores, leading to a smoother complexion. Neem extract also aids in balancing oil production, making it suitable for oily and combination skin types. Overall, neem extract contributes to the effectiveness of the peel-off mask by promoting clearer, healthier-looking skin ⁸. As mentioned in table no 1.

iii) Turmeric extract: Turmeric is highly incorporated into skincare products, including peel-off masks, due to its potential benefits for the skin. Turmeric contains curcumin, a compound known for its anti-inflammatory and antioxidant properties. ²³ As mentioned in table no 1.

The turmeric powder was purchased from the market and subsequently subjected to an extraction process using maceration. This method entailed combining five grams of neem with 50 ml of ethanol and macerate for 4-5 days.

iv) Saffron: Two grams of saffron threads are dissolved in 20ml of water for 24 hours. The extract used for further processing. Saffron is a key ingredient in peel-off masks, known for

Saffron is used for its skin-brightening properties, helping to improve complexion and reduce the appearance of dark spots and pigmentation. This makes it an ideal ingredient for promoting a more radiant and even-toned complexion. Moreover, saffron is known for its antioxidant properties, which play a crucial role in shielding the skin against environmental harm triggered by free radicals. This protective action aids in averting premature signs of aging, such as fine lines and wrinkles, thereby maintaining a youthful and healthy appearance of the skin.⁹ As mentioned in table no 1.

v) Lavender oil: Lavender oil, sourced from the local market, was incorporated into the formulation in a

quantity of 4-5 drops. It is known for its antibacterial and soothing properties; lavender oil is also valued for its delightful fragrance. Lavender oil imparts a pleasant and soothing aroma to the peel-off mask, enhancing the overall sensory experience during application. Antimicrobial properties: Lavender oil possesses natural antimicrobial properties, helping to inhibit the growth of bacteria on the skin. This can contribute to a cleaner and clearer complexion, reducing the risk of acne and other skin irritations¹⁰. As mentioned in table no 1.

vi) Methyl and propyl paraben: Preservatives were collected from laboratory of K.B.H.S.S. Trusts Institute of Pharmacy in Malegaon, Nashik in January 2024

vii) Glycerin: In the mixture, 4-5 drops of glycerin were employed. Glycerin plays a role as a moisturizing agent in this formulation. Hydration: Glycerin is a humectant, meaning it attracts moisture from the environment and binds it to the skin. When applied in a peel-off mask, glycerin helps to hydrate the skin by drawing moisture from the surroundings and retaining it within the skin layers. Furthermore, this aids in preventing moisture loss, thereby preserving the skin's hydration levels and suppleness. Glycerin also contributes to skin barrier protection by forming a shielding layer on the skin's surface. This protective barrier helps prevent moisture loss and shields the skin from various environmental stressors, including pollution and harsh weather conditions. By strengthening the skin's barrier function, glycerin helps to maintain its health and resilience. Smooth texture: Glycerin has emollient properties, which help to soften and smooth the skin's surface. When included in a peel-off mask, glycerin helps to improve the texture of the mask, making it easier to apply and ensuring a comfortable experience during removal ¹².

viii) HPMC & PVA: A combination of PVA (polyvinyl alcohol) and HPMC (hydroxypropyl methylcellulose) are employed as agents for forming films. In formulating the peel-off gel mask, polyvinyl alcohol is used as the foundational component, while Hydroxypropyl Methylcellulose serves the purpose of enhancing viscosity. The objective lies in evaluating the antioxidant efficacy of this specific formulation ¹³.



Figure 1: Ingredients Used in The Formulations

Table 1: Formula For Preparing Multi-Herb Peel Off Mask

Sr. No	Formulation Ingredients	Category	F 1	F 2	F 3
1	Fenugreek extract	Anti-acne	3ml	2ml	1ml
2	Neem extract	Anti-bacterial	1ml	2ml	2ml
3	Saffron extract	Anti-aging	3ml	3ml	3ml
4	Turmeric extract	Anti-inflammatory	1ml	2ml	2ml
5	Lavender oil	Fragrance	0.5ml	0.3ml	0.3ml
6	Methyl paraben	Preservatives	0.5gm	0.5gm	0.5ml
7	Propyl paraben	Preservatives	0.2gm	0.2gm	0.5ml
8	Glycerin	Moisturing agent	4-5 drops	4-5 drops	4-5 drops
9	PVA	Film forming agent	2gm	1.5gm	1gm
10	HPMC	Film forming agent	4gm	3gm	2gm
11	Water	Solvent	7ml	7ml	7ml

Method:

- 1) To begin, accurately measure all the ingredients.
- 2) Dissolve methyl paraben and propyl paraben in sufficient amount of water.
- 3) The film forming agent (HPMC & PVA) dissolve in water.
- 4) In extract of Fenugreek, Turmeric, Neem and saffron, Film formers has been added.
- 5) Then the methyl paraben and propyl paraben was added to above formulation.
- 6) Add enough of glycerine in the formulation.
- 7) After that, the lavender oil was added in the formulation to enhance the odour of product.
- 8) Then the formulation was placed in electric stirrer for 20 min for proper mixing.
- 9) At the end fill the formulation in to the well label and airtight container.

Evaluation Parameters:

- 1) Determination of pH:** The pH of the formulation was determined using a digital pH meter. Before usage, the pH meter was calibrated using. Standard buffer solutions at pH 4,7 and 9²¹.
- 2) Physical evaluation:** Physical characteristics such as color, appearance, consistency, and texture were checked for the prepared formulation.¹⁷.
 - Colour: The formulation's colour was checked against a white background.
 - Consistency: The consistency was determined by applying the formulation onto the skin.
 - Greasiness: Greasiness of formulation evaluated by applying the formulation onto the skin.
 - Odor: The odour of the gel was examined by mixing the gel in water and observing the Odor.

**Figure 3:** Formulation of Peel Off Mask

3) Peel off Test: After application, the peel off gel was uniformly spread over the face and hands and allowed to dry. Research suggests that the ideal drying period for the peel-off gel mask typically spans between 15 to 30 minutes³⁵. Employing a stopwatch, the drying duration of the gel mask was found to be 18 minutes. Subsequently, once fully dried, the mask was effortlessly peeled off from the skin's surface without any fragmentation, as demonstrated in the accompanying illustration.

4) Washability: The formulations were administered onto the skin, and subsequently, washing with water were meticulously examined. Washability of prepared peel off mask was good.

5) Irritation test: This parameter was evaluated using a patch test. Any signs of skin irritation at the patch site could suggest an allergic reaction¹⁷.

6) Spread ability: To assess spread ability, surplus sample gel was sandwiched between two glass slides and pressed to a consistent thickness by applying a weight of --- grams on the pan. The duration for which the upper glass slide took to separate from the lower plate, indicating spread ability²⁰

$$S = m \times 1/t$$

S-Spreadability

m-Weight tied to upper slide.

l-Length moved on glass slide.

t- time taken.

The pH levels across all formulations fell within the range of 7 to 7.8, indicating suitability for topical application without causing any discomfort.

RESULTS

Table 2: Physical Evaluation.

Formulation code	Colour	Odour	Consistency	Washability
F 1	Yellow	Sweet	Semi – solid	Good
F 2	Yellow	Sweet	Semi – solid	Good
F 3	Yellow	Sweet	Semi – solid	Good

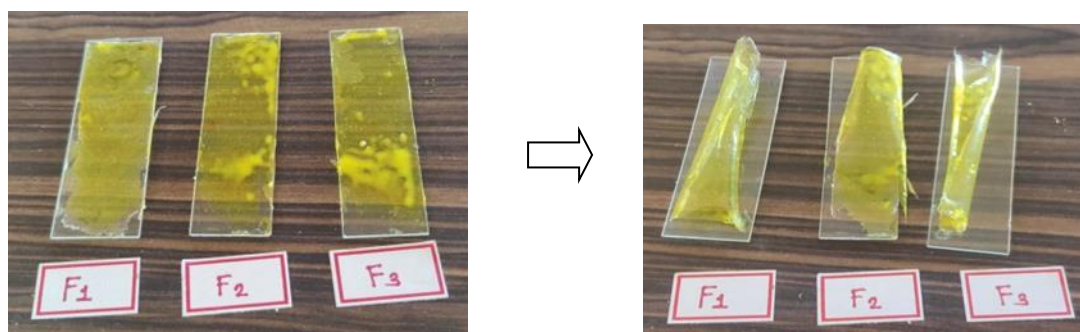


Figure 4: Image of Dried Peel Off Gel

Table 3: Evaluation Parameters Data

Parameters	F 1	F 2	F 3
Ph	7	7.4	7.76
Washability	Washable	Washable	Washable
Spreadability	9.8	8.1	7.6
Skin Irritation	Non-irritant	Non-irritant	Non-irritant
Drying time	17-20 min.	20-25 min.	23-27 min.
Peel off time	5 min	7 min	6 min
Stability	Stable	Stable	Stable

All formulations displayed a light-yellow, accompanied by a glossy and translucent look. Upon application to the skin, they imparted a smooth and refreshing sensation. The consistency and uniformity of each formulation was acceptable. Particularly, formulations F1, F2 and F3 exhibited a semisolid texture. Moreover, all formulations were homogeneous and washed off easily. Their pH levels leaned slightly towards alkalinity, aligning well with normal skin physiology. Assessment across all criteria indicated that batch F1 operated within expected parameters, hinting at its superiority over other batches.²¹. As shown in table no 2 and 3.

CONCLUSION

Comparing the F1, F2, and F3 evaluation parameters F1 exhibits superior spreadability, consistency, stability, peeling time, and drying time, therefore its formulation found better than F2 and F3. Nowadays, people are searching for side-effect-free remedies for a range of skin-related problems. Using herbal ingredients, it is possible to create cosmetics that are safer and less harmful than

synthetic formulations. The study on peel-off masks includes natural ingredients such as Fenugreek, Neem, saffron, Turmeric, lavender oil etc²⁸.

On human skin, the peel-off masks demonstrated good peel-off qualities without causing any irritation or itching. The combination of these natural ingredients exhibits antimicrobial, anti-inflammatory, and antioxidant properties, which may contribute to clearer, healthier skin.²⁹

On the effectiveness of a peel-off mask containing saffron, fenugreek, and neem would depend on numerous factors such as individual skin type, sensitivity, and specific skincare concerns. However, these ingredients are known for their potential benefits in skincare. A peel-off mask combining these ingredients could potentially offer skin nourishment, brightening effects.³¹

Feedback Form

Response no.	Multiherb peel off mask Spreadability is good?	Is multiherb peel off mask irritant to your skin?	Is mask peel off properly?	Drying time of multiherb peel off mask. (min.)	Peel off time. (min.)
1	Yes	No	Yes	17	3
2	Yes	No	Yes	20	2
3	Yes	No	Yes	18	5
4	Yes	No	Yes	21	4
5	Yes	No	Yes	18	5
6	Yes	No	Yes	17	3
7	Yes	No	No	10	5
8	Yes	No	Yes	15-20	3-7
9	Yes	No	Yes	15-20	3-7
10	Yes	No	Yes	17-20	3-7
11	Yes	No	Yes	15-20	3-7
12	Yes	No	Yes	17-20	3-7
13	Yes	No	Yes	17-20	3-7
14	Yes	No	Yes	17-19	3-7
15	Yes	No	Yes	17-20	3-7
16	Yes	No	Yes	17-20	3-7
17	Yes	No	Yes	17-20	3-7
18	Yes	No	Yes	17-20	3-7
19	Yes	No	Yes	17	5
20	Yes	No	Yes	17-20	3-7
21	Yes	Yes	Yes	17-20	3-7
22	Yes	Yes	Yes	18	3-7
23	Yes	Yes	Yes	15	5
24	Yes	Yes	Yes	19	3-7
25	Yes	Yes	Yes	16	7
26	Yes	Yes	Yes	17	7
27	Yes	Yes	Yes	15-20	4
28	Yes	Yes	Yes	17	4
29	Yes	Yes	Yes	17	3-7
30	Yes	Yes	Yes	17-20	6
31	Yes	Yes	Yes	22	3-5
32	Yes	Yes	Yes	20-25	3
33	Yes	Yes	Yes	20	4
34	No	Yes	Yes	20	5-7
35	Yes	Yes	Yes	20	5
36	Yes	Yes	Yes	20	4
37	Yes	Yes	Yes	15-20	5
38	Yes	Yes	Yes	20	5
39	Yes	Yes	Yes	21	5
40	Yes	Yes	Yes	5-10	6
41	Yes	Yes	Yes	20	3-7
42	Yes	Yes	Yes	21	5
43	Yes	Yes	Yes	5-10	5
44	Yes	Yes	Yes	18-20	7
45	Yes	Yes	Yes	18-20	4
46	Yes	Yes	Yes	18-21	4
47	Yes	Yes	Yes	5	4
48	Yes	No	No	20	5
49	Yes	Yes	Yes	21	3
50	Yes	Yes	Yes	21	4

Table 4: Feedback of volunteers for peel off mask

How much time taken for peel off?

50 responses

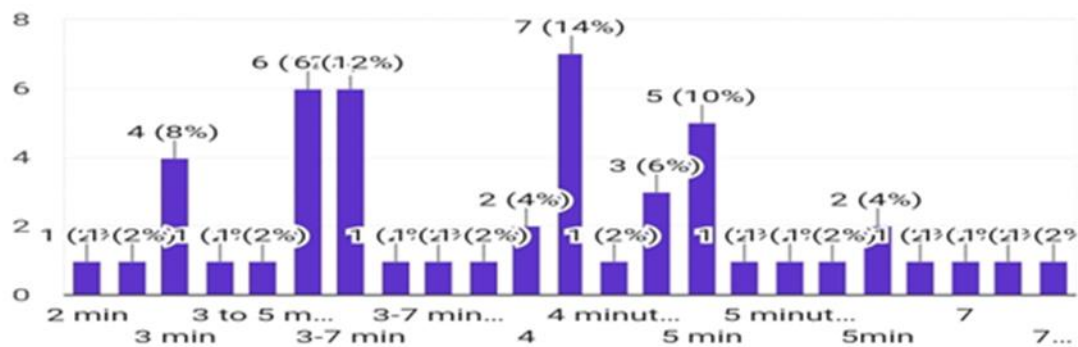
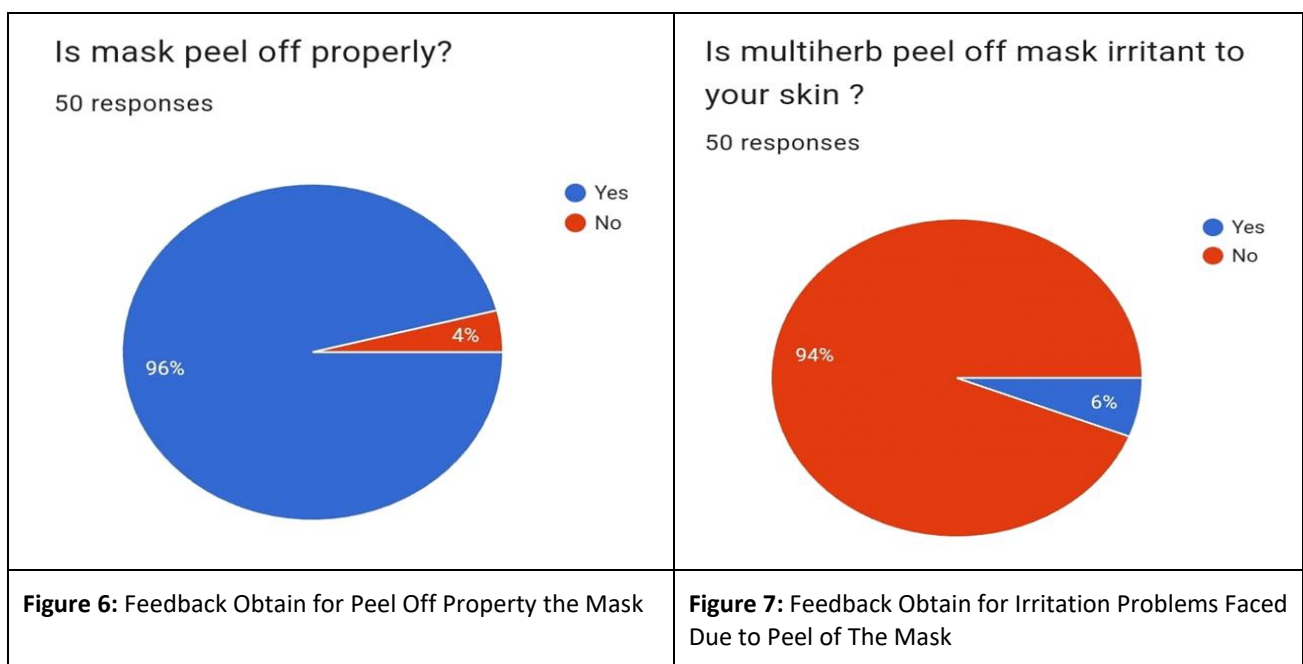


Figure 5: Feedback Obtain for Time Taken to Peel of The Mask



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