



## FORMULATION AND EVALUATION OF FACIAL PEEL OFF MASK GEL CONTAINING FENU GREEK

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### ABSTRACT

The peel off mask can be used as the remedy to treat facial skin related problems such as acne dark skin wrinkles etc. Fenugreek holds diosgenin which has anti-inflammatory and anti-bacterial effects. Fenugreek sloughs off the dead skin, revealing young, glowing skin beneath it also had moisturizing properties that help keep dry and flaky skin at bay. Hence The present work deals with the development and evaluation of the tropical peel-off gel mask containing a single herbal drug that is Fenu Greek and chemical reagents such as polymers example, polyvinyl alcohol Carbopol and sodium and remaining chemicals like triethanolamine, talcum powder and preservatives are

used in the gel formulation. Three formulation clumps that is F1, F2 and F3 were prepared and assess for various parameters like color, odour, consistency, washability, pH and spreadability. Further the peel-off gel masks for each batch were also prepared by drying them and evaluated for their peeling time. Amongst all the formulations studied, batch F2 was found best for all the parameters. Fenu Greek containing peel off mask gel (F2) reduces aches, acne and treats oily skin.

**KEYWORDS:** FenuGreek, peel off mask, polymers, washability and acne.

### INTRODUCTION

Skin is the extreme organ in the human body. The skin is an organ that functions as a preserver of internal organs from exposure to external materials, biological, physical and chemical substances. One of the external exposures that are injurious to the skin is sun exposure. Exposure to sunlight that release ultraviolet (UV) radiation can cause black spots on the face and make the face look dull. Acne is a well-liked disorder among the teenagers

which make them feel unappealing to look at and also a sort of inferior feel. Therefore, it is necessary to take care of facial skin to overcome this, one of which is taking care of facial skin by regularly using face masks.<sup>[1]</sup> Numbers of formulations are available in the market with a variety of active pharmaceutical ingredients for treatment of acne. Topical formulations are available in market as follows: gels, creams, lotions, face wash or cleansers.<sup>[2]</sup> The peel-off gel formulation is being prepared in order to depend the skin from external environment as well as to decrease the acnes and blemishes from skin surface. Also, to treat the oily skin, so that the skin can look more clear, beautiful and oil free. Instead of formulating only gel formulation, the peel-off gel formulation is easier, safe and efficacious remedy as compared to the gel formulation. The peel-off gel gives more instant and wanted effects than other forms of gel.

**Reason for using Fenu Greek drug:** The reason behind using Fenugreek powder as the main drug is its various effects for treating skin problems. The Fenugreek powder used in this peel-off gel formulation have been reported in the literature for its activity against skin problems i.e., it reduces acnes and treats oily skin, which is the aim for this research.

**Drug: Fenu Greek:** Fenugreek (*Trigonella foenum-graecum* Linn.) is an erect annual plant (height 30-60 cm.) belonging to family Leguminosae (Fabaceae). Various parts of fenugreek, mainly its leaves and seeds have been widely worn in the Indian food. It has several cosmetic and medicinal uses. Its seed powder has various benefits on skin i.e., it is having excellent antifungal and anti-inflammatory effects. And other uses as follows:

- **Anti-Ageing:** Fenugreek powder is excellent for slowing down the ageing process. It helps in the repairing of damaged cells regeneration of new cells. so, by using this powder one can get rid of ageing like wrinkles, fine lines, age spots etc.
- **Makes Skin Younger:** Fenugreek powder can be used as facial scrub to get rid of dead cells and blackheads and to have a glowing and young-looking skin.
- **Treats Skin Problems:** Using fenugreek powder provides relief from skin inflammations that are caused by burns, wounds, eczema etc. and speeds up the process of healing.
- **Treats Oily Skin:** Using face mask of fenugreek powder on oily skin can reduce the oiliness and also makes skin free from acne and other such skin problems.<sup>[3]</sup>

## MATERIALS AND METHODS

**Materials:** Fenu Greek were purchased from local market and powdered by grinding method. Then this powder was sieved by using 120 No. mesh sieve. All other materials and chemicals required for preparing gel and drying of peel-off mask were of analytical grade.

- 1. Fenu Greek:** It is used as the main drug in the formulation which will give the desired effects by application on skin.
- 2. Polyvinyl alcohol (PVA):** It is a water-soluble synthetic polymer which is colorless and odorless. PVA was dissolved in cold water gently with continuous mechanical stirring and allowed to swell for 2-3 hours. It acts as a film forming agent.
- 3. Carbapol (940 grade):** It is a gelling agent which provides appropriate thickness to the formulation.
- 4. Sodium carboxymethyl cellulose: Carboxymethyl cellulose (CMC)** or cellulose gum is a cellulose derivative added as viscosity modifier or thickener to stabilize the formulation.
- 5. Propyl and methyl paraben:** It is also used as a preservative in the formulation.
- 6. Talcum powder:** It is used as a softening agent in the formulation which is effective in decreasing acnes and oily skin.
- 7. Triethanolamine:** It acts as an alkali in the formulation. It is also used to raise the pH of certain mixtures, as well as acts as an emulsifier (to help various ingredients mix well) (thermo electron LLS PVT LTD).
- 8. Water:** It behaves as a base for the overall formulation.

**Table 1: Formulation Table for Preparing Topical Peel-Off Gel Formulation.**

Sl.no	Ingredients	Category	F1	F2	F3
1	Fenu Greek	Drug	1gm	1gm	1gm
2	Polyvinylalcohol (PVA)	Film former	5gm	6gm	7gm
3	Carbapol (940 grade)	Gelling agent	0.5gm	0.5gm	0.5gm
4	Sodium carboxymethyl cellulose (NaCMC)	Thickening agent	0.1 gm	0.2gm	0.3gm
5	Methyl paraben	Preservative	0.2gm	0.2gm	0.2gm
6	Propyl paraben	Preservative	0.02gm	0.02gm	0.02gm
7	Talcum powder	Softening agent	2gm	2gm	2gm
8	Triethanolamine	Alkali	1-2 ml	1-2 ml	1-2ml
9	Water	Base	100ml	100ml	100ml

**Method:** Carbapol was sprinkled slowly in demineralized water with constant stirring and kept overnight for hydration. After complete hydration add polyvinyl alcohol, methyl paraben, propyl paraben was added in Carbapol solution and stirred gently until the PVA swells. To this add gram flour powder was mixed gently and dissolved. Drug solution with

Carbapol and PVA was then added with sodium carboxymethyl cellulose undergoing continuous stirring. Triethanolamine added to the obtained solution to maintain pH and to achieve desired consistency of the formation. Talcum powder was mixed to it for giving the formulation opacity. End volume was made up with the purified water. After addition of whole ingredients, stir continuously until a soft dispersion is obtained. The gel fusion was collected and store in worthy plastic container and used for doing evaluation parameters.<sup>[4,5]</sup>

### EVALUATION PARAMETERS FOR PEEL OFF GEL FORMULATION

- 1. Organoleptic:** The consistency and the colour was checked visually. The odour was evaluated manually by smelling the product.
- 2. pH:** 1% solution was prepared and checked for the pH using pH meter.<sup>[6]</sup>
- 3. Washability:** Formulations were applied on the skin and then ease and extent of washing with water were examined manually.<sup>[2]</sup>
- 4. Spreadability:** For determination of Spread ability Excess sample was placed between the two glass slides and 100 g weight was placed on the glass slide for 5 min to compress the sample to a uniform thickness. mass (250 g) was added to the pan. The time in seconds required to separate the two slides was taken as a measure of Spread ability.<sup>[7]</sup>

### Formula

$$S = m * l/t$$

Were,

S –Spread ability

m - Weight tied to upper slide

l - Length budge on glass slide

t - Time taken

- 5. Status of the peel-off film:** After drying film was able to remove from the applied site and it was soft to hard. drying time took longer time 30-35mins.<sup>[3]</sup>
- 6. Coverage test:** Coverage test was then performed by weighing 0.5 g of the gel, placed on a 20 cm × 20 cm glass and then covered with another glass of the same size. Weights up to 125 g were placed on top, and after 1 min, the diameter was measured coverage test was evaluated until 28 days.<sup>[8]</sup>
- 7. Homogeneity Test:** The homogeneity test was carried out by placing the preparation between two slides and observing their appearance and presence of any aggregates.<sup>[9]</sup>

**8. Skin irritation study:** The formulated peel-off should not make any skin irritation or skin sensitization, after its application on the skin or else it will be unsuitable for application on the skin. Hence the Fenu Greek peel off gel formulation was subjected to skin irritation study using Draize modified scoring technique.

**Table no 02: Evaluation of primary skin irritation index (PII).**

Evaluations	Score
Non-irritant	0.0
Negligible irritant	0.1 – 0.4
Slight irritant	0.41 – 1.9
Moderate irritant	2.0 – 4.9
Severe irritant	5.0 – 8.0

The score was found to be 0.0. Thus, the formulation was found too non-irritant. The peel was taken out from the skin surface. It was observed that the peel was removed gently without breaking.

### 9. Erythema and edema scoring method for skin reaction

From the results observed there was no edema and no erythema observed on the skin surface and the score was found to be zero in both cases.<sup>[10]</sup>

**Table no 03: Erythema and edema scoring method for skin reaction.**

Sl.no	Skin Reaction	score
	(A)Erythema and Eschar formation	
1	No erythema	0
2	Very slight erythema	1
3	Well defined erythema	2
4	Moderate to severe erythema	3
5	Severe erythema causing redness to eschar formation	4
	(B)Edema formation	
1	No edema	0
2	Very slight edema (barely perceptible)	1
3	Slight edema (edges of area well raised)	2
4	Moderate edema (raised approx. 1mm)	3
5	Severe edema (raised more than 1 mm and extending beyond area of exposure)	4

## RESULTS AND DISCUSSION

The pH for all formulation ranged from 7.1–7.3. Which may be suitable for topical application without discomfort.

**Table no 04: Physical evaluation.**

Formulation code	Colour	Odour	Consistency	Washability
F1	Light green	Pungent	Semi – solid	Good
F2	Light green	Pungent	Semi – solid	Good
F3	Light green	Pungent	Semi –solid	Good

**Table no 05: Evaluation parameter data.**

Parameters	Observations	Observations	Observations
	F1	F2	F3
Washability	Washable	Washable	Washable
pH	7.2	7.1	7.3
Coverage time	2.3cm	2.4cm	2.5cm
Peeling time	35min	30min	40min
Skin irritation	Non irritant	Non irritant	Non irritant
Erythema & Edema	No	No	No

All the formulations were light greenish in colour. The formulations were glossy and translucent. On application to the skin, all formulations produced smooth and refreshing effect. The consistency and homogeneity of all formulations were adequate. The results of this investigation showed formulation F1, F2 and F3 had semisolid consistency. All the formulations were established homogenous, easily washable. All the formulations had very slightly alkaline pH which was harmonious with normal skin physiology. The normal range of pH of skin is 4.5-7.1. Amongst all the formulations batches i.e., F1, F2 and F3, F2 batch is the effective one because it is having best pH and peeling time less than F1 and F3. All the evaluation variables of F2 batch are in the usual range, so by considering this, F2 batch is more efficacious than other batches.

## CONCLUSION

Topical peel-off gel formulation was prepared by using Fenugreek powder as the main drug. Total three batches of topical peel-off gel formulation were prepared. Among all batches F1 to F3, batch F2 was the best formulated gel. Thus, this peel-off gel formulation could be the safe and efficacious remedy for treating these dermatological disorders and could be the safe alternative to synthetic anti-acne gels.

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