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FORMULATION AND EVALUATION OF FACIAL PEEL OFF MASK GEL CONTAINING GRAMFLOUR

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ABSTRACT

The peel-off gel formulation is being prepared in order to save the skin from external environment as well as to reduce the acnes and blemishes from skin surface. Also, to treat the oily skin, so that the skin can take more clear, beautiful and oil free. The most common skin problems among youngsters, usually 18-25 years of age acne and oily skin. The present work deals with the development and evaluation of the topical peel-off mask containing a single herbal drug that is gram flour and excess chemical reagents such as polymers example polyvinyl alcohol Carbopol and sodium. Also, excess chemicals like triethanolamine, talcum powder and preservatives are worn in the gel formulation. Three formulation batches that is F1, F2 and F3 were prepared and evaluated for variables like color, odour, consistency, washability, pH and spreadability. Amongst all the formulations studied, batch F2 was found optimum for all the parameters. The gram flour powder used in this peel-off gel formulation have been reported in the literature for its activity against skin problems. That is, it reduces acnes and treats oily skin. While the gel also showed good results for all the evaluation variables.

KEYWORDS: Gram flour, polymers, peeling time and acne, wrinkles.

INTRODUCTION

Cosmetics are developed to reduce wrinkles, fight acne and to control oil secretion. For various types of skin ailments formulations like skin protective, sunscreen, antiacne, antiwrinkle and antiaging are designed using varieties of materials, either natural or synthetic.[1] One of the most usual disorders established among youngsters usually 18-25 years of age is Acne. Acne is an amateur disorder among the teenagers which make them feel

unappealing to look at and also a sort of inferior feel. Herbal plants are well known for their medicinal and cosmetic uses. Many synthetic drugs like Benzoyl peroxide, antibiotics, and anti-androgens are used to treat the disorder but exhibit several complications like dryness of skin, dermatitis, bleaching cloth, etc. 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. The peel-off gel formulation is being prepared in order to save the skin from external environment as well as to reduce the acnes and blemishes from skin surface. Also, to treat the oily skin, so that the skin can take more clear, beautiful and oil free. Instead of formulating only gel formulation, the peel-off gel formulation is easier, safe and efficacious treatment as compared to the gel formulation. The peel-off gel gives more instant and advantageous effects than other forms of gel.[2]

Peel-off gel formulation: A peel-off mask is applied as a liquid film that is thinly apply with fingers on the face or body part. It is allowed to dry for several minutes. Then dragged away from face with fingers. It peels-off as a thin plasticized film. It is usually performed that such masks require a relatively little period of time to dry down to be pulled – off, such peel-off masks commonly provide deep pore cleansing and skin debris removal. Peel off gel formulation developed is suited for the application over the open and uncovered parts of the body gels have good stability comparatively with other drug dosage from and does not relate with breaking and rancidity problems.[3]

Reason for using gram flour drug: Gram flour, commonly known as began, has been used broadly since the olden times for its beauty-enhancing benefits. It mainly acts as a tonic for the skin as it helps to clean and sluff it. Gram flour is nothing but a gram flour gets from grinded chickpeas. It is very advantageous for skin as well as hair. It is used to reduce tanning of the skin also decreases the oiliness of skin, thus pronging as a good anti-pimple agent. It lightens the skin tone, therefore used as a direct fairness agent.

Drug: gram flour This is a pulse flour produce from ground chickpea (also known as Bengal gram or garbanzo). A staple diet in the cuisine from the Indian subcontinent, this flour can be manufacture either from raw or roasted chickpeas. The raw variety is slightly bitter, while the roasted variety is more flavorful.

1. **Helps to treat acne:** The zinc in gram flour can combat with infections that cause acne and the fiber stabilizes blood sugar levels. unbalanced blood sugar level can stress your hormones causing breakout or pimples, gram flour can prevent that.
2. **Removes tan:** Wondering to use besan for tan removal.
3. **Exfoliates dead skin:** You can also use gram flour as a body scrub and sluff your dead skin.[4]

MATERIALS AND METHODS

Materials: Gram flour 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 scientific grade.

1. **Gram flour:** It is used as the main drug in the formulation which will give the wanted 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 kindly with continuous mechanical stirring and allowed to swell for 2-3 hours. It behaves as a film forming agent. (SD fine chem limited)
3. **Carbopol (940 grade):** It is a gelling agent which gives appropriate thickness to the formulation. (Rolex chemical industries)
4. **Sodium carboxymethyl cellulose (NaCMC):** Carboxymethyl cellulose (CMC) or cellulose gum is a cellulose derivative added as viscosity modifier to stabilize the formulation.
5. **Methyl paraben:** It is used as a preservative in the formulation.
6. **Propyl paraben:** It is also used as a preservative in the formulation.
7. **Talcum powder:** It is used as a softening agent in the formulation which is efficacious in reducing acnes and oily skin.
8. **Triethanolamine:** It acts as an alkali in the formulation. It is also used to raise the pH of definite mixtures, as well as acts as an emulsifier (to help various ingredients mix well) (Thermo Electron LLS PVT LTD).
9. **Water:** It acts as a base for the overall formulation.

METHOD

Carbopol 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. [5.6.7]

Table no 1: Formulation table for preparing topical peel-off gel formulation.

Sl.no	Ingredients	Category	F1	F2	F3
1	Gram flour powder	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	0.1gm	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

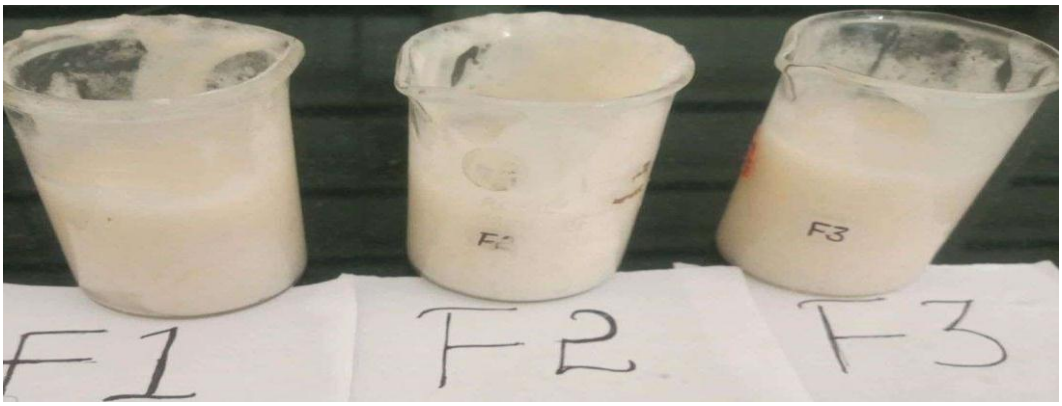

Fig no 01: Prepared Peel off Gel Formulations.

EVALUATION PARAMETERS FOR PEEL OFF GEL FORMULATION

1. **Physical evaluation:** Physical such as colour, appearance and consistency and feel were examined of the prepared formulation.

Colour- The colour of the formulation was checked out against white background

Consistency- The consistency was inspected by applying on skin.

Greasiness- The greasiness was assessed by the administration on the skin.

Odour- The odour of the gels was examined by mixing the gel in water and taking the smell.

2. **Washability:** Formulations were applied on the skin and then ease and extent of washing with water were checked manually.[6]

3. **Folding endurance:** Folding endurance of films was measured manually by repeatedly folding a small strip of film (2 cm × 2 cm) at the same place till it broke or was folded up to 200 times without breaking. The number of times the film could be folded at the same place without breaking was the folding endurance value.[8]

4. **Determination of pH:** 2.5 g of gel were accurately weighed and dispersed in 25 ml of distilled water. The pH of the dispersion was measured by using a digital pH meter.[9]

5. **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.[10]

6. **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. [2]

7. **Drying time:** The drying time test was performed by observing the time needed by the gel to dry, which starting from the gel application on the skin of the face until dry layer was created.

8. **Skin irritation study:** The formulated peel-off should not cause any skin irritation or skin sensitization, after its application on the skin or else it will be unsuited for application on the skin. Hence the gram flour 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 removed from the skin surface. It was observed that the peel was pull out easily Without breaking.

9. Erythema and edema scoring method for skin reaction: From the results observed there was no edema and no erythema noticed on the skin surface and the score was found to be zero in two cases.[11]

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 DISCUSIONS

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

Table no 04: Physical evaluation.

Formulation code	Colour	Odour	Consistency	Washability
F1	Milky white	Menthol	Semi – solid	Good
F2	Milky white	Menthol	Semi – solid	Good
F3	Milky white	Menthol	Semi –solid	Good

Table no 05: Evaluation parameter data.

Parameters	Observations	Observations	Observations
	F1	F2	F3
Washability	Washable	Washable	Washable
Folding endurance	50±0.58	67±0.64	60 ±0.59
pH	7.2	7.1	7.3
Coverage time	2.3cm	2.4cm	2.5cm
Peeling time	40min	30min	45min
Skin irritation	Non irritant	Non irritant	Non irritant
Erythema & Edema	No	No	No

All the formulations were milky white in colour. The formulations were glossy and translucent. On administration to the skin, all formulations make smooth and cooling effect.

Fig no 02: The Consistancy And Homogeneity Of All Formulations.

The consistency and homogeneity of all formulations were useful. The results of this investigation showed formulation F1, F2 & F3 had semisolid consistency. All the formulations were established homogenous, easily washable. All the formulations had very bit alkaline pH which was compatible with normal skin physiology. The normal range of pH of skin is 4.5 – 7.1. amongst all the formulations batches that is F1, F2 and F3, F2 batch is the effective one because it is having very optimum pH and folding endurance than F1 & F3 batches and also the peeling time is less as compared to other batches. All the evaluation parameters of F2 batch are in the normal range, so by considering this, F2 batch is more effective than other batches.

CONCLUSION

Topical peel-off gel formulation was prepared by using gram flour powder as the main drug, which was already known to have Anti-acne, Anti-aging, Anti-inflammatory activity and also having property to treat oily skin and other skin problems. Total 3 batches to 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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