



RESEARCH ARTICLE

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Formulation and Evaluation of Polyherbal Face Scrubber for Oily Skin in Gel Form

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ABSTRACT

Cosmetics play a vital role for everyone to have a joyful and sanguine life. In present scenario herbal cosmeceuticals have more demand because they have no side effects. People having oily skin suffer from acne, whiteheads and blackheads quite often so scrubbing become more essential. In our present study we formulated 3 different formulations F1, F2, F3 in gel form for oily skin by using turmeric, aloe vera, cinnamon, potato starch, activated charcoal powder, honey, green tea, lemon juice, onion, walnut shell, coconut oil, beet root juice powder, sodium lauryl sulphate, water and evaluated by using various parameters such as physical appearance, viscosity, pH, Spreadability, irritability, washability, stability studies and got fruitful results with all the tests. The scrub F2 was found to show excellent effects on controlling oil secretion, and preventing formation of new pimples. The herbal formulation F2 was having characteristic odour, reddish brown in color having, light, non-irritant to the skin and quite elegant. The powder was smooth to touch and in gel form it spreads satisfactorily. Thus, the formulated scrub F2 can be utilized efficaciously without a side effect which exfoliates and makes glowing skin.

Keywords: Organogels, Hydrogels, Polymers, Antiseptic, Antimicrobial.

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INTRODUCTION

Facial scrub is the cosmetic product which cleanses, exfoliates the skin of the face and gives healthy complexion. Generally, skins are of three types; dry skin, oily skin, and sensitive skin. The people with dry skin must use facial scrub which contains hydrating ingredients and moisturizer is must for them after using scrub. Gentle scrubs should be used for sensitive skin. For those who are having oily skin, it is essential to get a scrub that exfoliates deeply to prevent the pores

from clogging and also to balance the skin's oil production. We can use a face scrub twice or thrice a week followed by lightweight face oil. Regardless of skin type, always we should select a scrub which is not hurtful but gentle to the skin. The harsh ones can do more harm than good to the skin. For oily skin, Gel based scrub is preferred. For dry skin, cream based scrub is useful. For sensitive skin, scrubs with super soft granules are having good results. An ideal scrub is accepted to possess the properties like it should be non

toxic, possess small gritty particles, mild abrasive, non irritating, non sticky, able to remove dead skin cells.

Facial scrub in gel form is having many advantages than other formulations for topical application. Gels are the semi-solid dosage forms that are used for topical application. They are most predominant among all the semi-solid dosage forms. Gel is the network of mixture of gelling agent and a solvent. The drug molecules are embedded or entwined evenly in the solvent. Based on the nature of the solvent, gels are basically of two types, Hydrogels and Organogels. Gels are composed of two interpenetrating systems where the colloidal particles, also known as the gelator or gallant, are uniformly distributed throughout a dispersion medium or solvent forming a three dimensional matrix known as the gel. [1-2] The gels are prepared by adding a gelling agent (gelator) which could be natural, synthetic or semi-synthetic polymer or low molecular weight small molecules, into an organic, inorganic or aqueous solvent or solvent systems. [3-6] The polymer in gels acts as the backbone of the gel matrix. The polymeric meshwork gives gel its structural strength, increased adherence to the surface where applied and decreased permeation of the larger molecules hence making the retention possible. [7] During the gel formation, swelling occurs as a result of solvent penetration causing the polymer network to stretch and hold its shape and entwine the drug particles in them. [7-8] Viscosity plays an important role in the preparation of a gel. Gel present in its solution form requires a specific concentration of polymer to increase its viscosity. [8] Our existing products in the market contain synthetic chemical ingredients of polymers like microplastics, gelling agents like carbopol, humectants like propylene glycol, coloring agent and preservatives like methyl paraben and propyl paraben that can cause irritation to the sensitive skin and may pollute the environment. Our present work aimed at formulating the scrub containing herbal gelling agent (potato starch), humectants (honey), coloring agent (beet root juice) so that it has no side effects and contains herbal products also as excipients.

MATERIALS AND METHODS

Materials

All the ingredients were powdered and sieved through sieve no. 120. Then they were packed in moisture resistant, well closed containers. The different ingredients with their key uses are enlisted in table 1.

Preparation of extract

The extract was prepared by cold maceration process. All the active ingredients (turmeric, cinnamon, aloe vera, activated charcoal, honey, green tea, lemon juice, onion, coconut oil) were ground and kept in water for 72 hours. This was dried and kept in desiccator for further process.

Preparation of gel

Sodium lauryl sulphate was weighed and dissolved in water and this solution is added to the potato starch

which is used as a gelling agent. To this add the above prepared extract and stirred it for 5 min. Walnut shell microbeads added to this mixture which gives grittiness to the gel.

Table 1: List of ingredients used for formulation

S. No	Name of the ingredient	Uses
1.	Turmeric	Used as an Antibacterial, antifungal and brings glow to the skin.
2.	Aloe-vera	Moisturizing agent and delivers smoothing property to the skin.
3.	Cinnamon	Anti-inflammatory property, Removes acne, scars and wrinkles.
4.	Potato starch	Natural scrubber, skin lightening agent, gelling agent.
5.	Activated charcoal powder	Activated charcoal removes dirt, chemicals, bacteria, poisons, and other micro-particles from the surface of skin, brings flawless complexion and clears acne.
6.	Honey	Used as humectants and as nutrient, used as thickening agent.
7.	Green tea	Polyphenols containing green tea helps in anti ageing, skin looks younger and attractive.
8.	Lemon	The high content of Vitamin C in lemon will help to lighten the skin tone and remove dark spots which were caused by skin tan.
9.	Onion	Acne, blackheads for blemished skin.
10.	Walnut shell	Exfoliator that gently removes impurities and dull cells leaving skin instantly smooth and radiant
11.	Coconut oil	Nutrient, Skin tonic and emollient.
12.	Beet root juice powder	It is used as a coloring agent. It also gives healthy and glowing skin.
13.	Sodium lauryl sulphate	Surfactant used as a cleaning and foaming agent
14.	Water	Solvent

Table 2: Composition of developed formulation.

S. No	Ingredients	Quantity taken for 10 g gel		
		F1	F2	F3
1.	Turmeric	0.5 g	0.5 g	0.5 g
2.	Aloe vera	0.7 ml	0.7 ml	0.6 ml
3.	Cinnamon	0.01 g	0.01 g	0.01 g
4.	Potato starch	0.5 g	0.75 g	0.25 g
5.	Activated Charcoal	0.2 g	0.2 g	0.3 g
6.	Honey	3 ml	4 ml	3 ml
7.	Green tea	0.2 g	0.1 g	0.1 g
8.	Lemon	0.7 ml	0.8 ml	0.7 ml
9.	Onion	0.01 ml	0.01 ml	0.01 ml
10.	Walnut shell	0.5 g	0.5 g	0.5 g
11.	Coconut oil	0.2 ml	0.2 ml	0.2 ml
12.	Beet root juice powder	0.2 ml	0.2 ml	0.2 ml
13.	Sodium lauryl sulphate	0.01 g	0.01 g	0.01 g
14.	Water	q.s	q.s	q.s

Evaluation

Color: The color of the face wash gel was checked visually.

Odour: The formulation was evaluated for its odour by smelling it.

pH: 1% solution of our sample was measured by using a digital pH meter at constant temperature. [9]

Consistency: It was tested manually.

Spreadability: Two slides are taken and herbal sample was placed on one slide. Other slide was placed on the

first slide. 100 g of weight was kept on the slides so that it spreads as a thin layer. Weight was been eliminated much high than the prisons. Next weight of 20 g was kept on the upper slide. It was performed for 3 times and average was calculated.

Spreadability was calculated by using the following formula,

$$S=M \times L/T$$

Where, S- Spreadability; M- Weight tied to the upper slide (20 g); Length of the glass (6.5 cm); Time in sec.

Viscosity: Brookfield viscometer was used to measure the viscosity of our sample. Viscosity of sample and water were taken in poise.

Washability: Formulations when applied on the skin can be easily removed by washing with water were tested manually.

Grittiness: The product was checked for the presence of any gritty particles by applying it on the skin

Foamability: Small amount of gel was taken in a beaker containing water. Initial volume was noted; beaker was shaken for 10 times and noted the final volume. Grittiness: The formulation was checked for the presence of any gritty particles by applying it on the skin.

Patch test: Patch testing is well established method for diagnosing the hypersensitivity as well as to determine the potential of a specific substance to cause the allergic action on patient skin. In patch test a small area of skin is exposed to those chemicals in dilute form whose specific effect on skin is to be studied. In patch test reaction of formulation on skin is observed in 2-3 days.

Stability studies [10]: the stability of the formulation was tested by filling the scrub in plastic containers and placing it in humidity chamber at 45°C and 75% relative humidity. The stability of the formulation was inspected for 3 months at interval of one month each.

Table 3: Evaluation parameters for polyherbal facial scrub

S. No	Parameters	Observation		
		F1	F2	F3
1.	Colour	Reddish brown	Reddish brown	Reddish brown
2.	Odour	Characteristic	Characteristic	Characteristic
3.	pH	6.0	5.8	6.2
4.	Consistency	Semi-solid	Semi-solid	Semi-solid
5.	Spreadability	4.8 g-cm/sec	5.6 g-cm/sec	4.1 g-cm/sec
6.	Viscosity	1.4 poise	1.7 poise	1.2 poise
7.	Washability	Good	Easily washable	Good
8.	Grittiness	No	No	No
9.	Foamability	150 ml	150 ml	150 ml
10.	Patch test	no allergic action	no allergic action	no allergic action

RESULTS AND DISCUSSION

Formulation F1, F2, F3 was tested using various evaluation parameters. Spreadability, viscosity and pH

of F2 formulation was found very good when compared to F1 and F3.

Stability studies: stability studies of F2 formulation gives good results during 3 months and the values are below.

Table 4: Results for stability studies of F2 formulation

Parameter	Initial	1 st month	2 nd month	3 rd month
Colour	Reddish brown	Reddish brown	Reddish brown	Reddish brown
Odour	characteristic	characteristic	characteristic	characteristic
Spreadability	5.6 g-cm/sec	5.5 g-cm/sec	5.4 g-cm/sec	5.4 g-cm/sec
pH	5.8	5.7	5.6	5.5
Viscosity	1.7 poise	1.6 poise	1.58 poise	1.56 poise

All the ingredients used in this poly herbal facial scrub are our food ingredients. So, the chances for its side effects are less. F2 is more effective than F1 and F3. We can use this herbal facial scrub for getting best results for oily skin. The efforts are on to reformulate the scrub in a gel form in order to achieve better spreadability along imparting emollient and smoothing action.

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