

Formulation and Evaluation of Herbal Moisturizer Cream Using Chia Seed Oil and Aloe Vera

A. Vasanthan¹, M. Annadurai², T. Archana³, M. Arsinia⁴

¹Associate Professor of Sri Vijay Vidyalyaya College of Pharmacy, Nallampalli, Dharmapuri. Tamil Nadu (INDIA)

^{2,3,4}B. Pharm student of Sri Vijay Vidyalyaya College of Pharmacy, Nallampalli, Dharmapuri. Tamil Nadu (INDIA)

Abstract—Herbal cosmetics have gained attention by the performance of the herbal ingredients which contains favourable safety profile and multi action on the skin. The present study was conducted to formulate and evaluate the herbal moisturizer cream using chia seed oil (*salvia hispanica* L) and aloe vera gel those two are the active ingredients. Chia seed oil contains the high amount of essential fatty acid like α -lilolinic acid which contains naturally occurring antioxidants they mainly involves in maintaining skin barrier. Aloe vera contains the moisturizing, soothing and anti inflammatory property both two active ingredients formulated in topical formulation to provide nourishment and hydration to the dry and sensitive skin. The herbal moisturizer cream was prepared using suitable excipients to obtain stable and homogeneous formulation. The prepared cream was evaluated by various parameter like appearance, pH, homogeneity, spreadability, viscosity and washability. The formulation satisfies physical characteristics and good moisturizing property with compatibility. In this study the combination of chia seed oil and aloe vera where effectively formulated into herbal moisturizer cream with desirable quality. The developed formulation have the efficacy to provide effective skin hydration and nourishment with natural ingredients. This study shows that herbal based cosmetic formulations are safe and effective alternative to synthetic formulation.

Index Terms—Herbal moisturizing cream, Chia seed oil, Aloe vera, Topical formulation, Skin hydration, Cosmetic evaluation.

I. INTRODUCTION

Cream are the topical preparation which are meant to apply on surface of the skin. They are "semisolid emulsion either water-in-oil (W/O) or oil-in-water

(O/W) type". where the consistency where change by vary in ratio of water and oil. Creams are used for various purposes like the nourishing, cleansing, beautifying and protection the skin. The topical formulation where produce there action locally on the site of application they where designed to deliver the drug on the specific regions to treat various skin conditions and skin diseases.

Moisturizer cream are formulated by mostly by oil-in-water emulsion type. the water or aqueous phase delivers hydration and oil phase delivers a occlusive property it locks up the moisture on the skin and provide hydration property. in this study we use the chia seed oil and aloe vera gel as the two major active ingredients. The chia seed oil contains the essential fatty acid and major antioxidants it provide the occlusive and anti oxidant effect on skin. And the aloe vera contains the moisturizing property naturally when we combine those two compounds in this formulation it gives the well formulated herbal moisturizer cream.

In the growing society the consumer have the awareness about the safety and side effects about the skin care ingredients what where used in the formulation. plant derived oils and botanical extracts used for there compatibility with the skin and containing natural occurring essential fatty acids, vitamins and active phytochemical, while comparing to the synthetic ingredients, herbal ingredients are more preferred due to the low risk of side effects like irritation and also provide nourishment and protection.

Chia seed oil (*salvia hispanica* L) contains the high amount of omega-3 and omega-6 fatty acids, phenolic antioxidants. It strengthens the skin barrier,

reduce oxidative stress and improving moisture retention. Aloe vera (*Aloe barbadensis miller*) is more studied medicinal compound and it contains polysaccharids, vitamins, enzyme, amino acids and minerals which are responsible for hydration, soothing, and support tissue repair. Those two promising active ingredients used in the herbal formulation.

The present study was undertaken to formulate an oil-in-water emulsion type herbal moisturizer cream containing chia seed oil and aloe vera gel using suitable pharmaceutical excipients. The formulation where evaluated for phytochemical characteristics like the appearance, pH, viscosity, spreadability, homogeneity, washability, and skin compatibility, in order to identify the optimum formulation for topical applications.

II. PLANT PROFILE

2.1 Chia seed oil



Figure No: 01 Chia seed oil

BOTANICAL NAME: *Salvia hispanica L.*
SYNONYMS: Chian, salvia chia, salba, black chia.
FAMILY: Lamiaceae (labiateae).

Description:

Chia seed oil is a highly nutritious, cold pressed oil from the seed of the plant. It is light, mild flavoured, and nutrient rich in antioxidant and polyphenols used in culinary dishes and skincare for hydrating, anti-inflammatory, and anti aging properties.

2.2 Aloe vera gel



Figure No: 02 Aloe vera gel

BOTANICAL NAME: *Aloe barbadensis miller*

SYNONYMS: aloe perfoliata var, aloe vulgaris lam.

FAMILY: Asphodelaceae.

Description:

Aloe vera is a succulent, cactus like plant known for its thick and fleshy green leaves containing a clear medicinal gel, widely used topically for skin issues like burns and wounds and for its antioxidant, anti-inflammatory, and hydrating properties.

III. MATERIALS AND METHODS

3.1 Materials

Chia seed oil, aloe vera and the auxiliary excipients employed in the preparation of the cream, are presented in Table -1.

Table -1: Materials Used

Material
Chia seed oil
Aloe vera
Coconut oil
Castor oil
Beeswax
Borax
Cetostearyl alcohol
glycerin
Methylparaben
Distilled water
Vitamin E
Fragrance

3.2 Equipment

The instruments employed for the formulation and subsequent evaluation of the cream are presented in Table -2.

Table -2: Equipment Used

Equipment
Magnetic stirrer with hot plate
Mechanical stirrer
Brookfield viscometer
Digital pH meter
Thermometer
Digital weighing balance
Glassware (beakers, cylinders)

3.3 Formulation of Herbal Moisturizing Cream

Five candidate formulations (F1–F5) were developed by systematically varying the proportions of chia seed oil, aloe vera gel and distilled water, while the remaining excipients were held constant, in order to establish which combination yielded the most favourable overall consistency and stability. The resulting compositions are presented in Table -3.

Table -3: Composition of Herbal Moisturizing Cream Formulations (F1–F5)

Ingredient	F1	F2	F3	F4	F5
Chia seed oil (ml)	7.5	7.0	4.5	6.0	6.0
Aloe vera gel (ml)	3.6	6.0	6.0	7.0	6.5
Coconut oil (ml)	1.5	1.5	1.5	1.5	1.5
Castor oil (ml)	1.5	1.5	1.5	1.5	1.5
Borax (g)	0.3	0.3	0.3	0.3	0.3
Beeswax (g)	2.4	2.4	2.4	2.4	2.4
Cetostearyl alcohol (g)	0.9	0.9	0.9	0.9	0.9
Glycerin (ml)	1.5	1.5	1.5	1.5	1.5
Methylparaben (g)	0.3	0.3	0.3	0.3	0.3
Vitamin E (ml)	0.3	0.3	0.3	0.3	0.3
Distilled water (ml)	9.0	6.9	13.2	10.2	7.2
Fragrance	Q.s	Q.s	Q.s	Q.s	Q.s

3.4 Method of Preparation

- Weigh accurately the required quantities of chia seed oil, coconut oil, castor oil, beeswax, and cetostearyl alcohol.
- Prepared the aqueous phase by mixing aloe vera gel, distilled water, glycerin, and borax.
- Heated the aqueous phase to 70–75 °C until the borax dissolved completely.
- Added the hot aqueous phase slowly to the oil phase with continuous stirring.
- Continued stirring until a smooth and homogeneous water-in-oil emulsion was formed.
- Allowed the emulsion to cool to below 40 °C.
- Add methylparaben, then mixed gently to ensure uniform distribution.
- Stirred the cream until it reached room temperature.
- Transferred the prepared cream into clean, airtight containers and stored it under suitable conditions for further evaluation.

3.5 Evaluation of Formulated Cream

3.5.1 Organoleptic Evaluation

The cream was visually inspected for the appearance, texture, odour and colour.

3.5.2 pH Determination

Collect the sample in a clean and dry beaker and rinse the electrode with distilled water and wipe with tissue paper. then calibrate the electrode with standard acidic and alkali buffer solutions. immerse the electrode in the sample ensure that electrode bulb is immersed in the sample and record the pH value.

3.5.3 Homogeneity

The cream was inspected visually and by rubbing two fingers to detect the presence any lumps, sedimentation or any other foreign particles.

3.5.4 Spreadability

Spreadability was determined by placing a fixed amount of cream between two glass slides and measuring the ease and time required for the upper slide to move under a standard weight.

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

- S is the Spreadability of gel formulations,
- M is the weight (g) tied on the upper plate,
- L is the length (cm) of the glass plates,
- T is the time taken for plates to slide the entire length.

3.5.5 Viscosity

The viscosity of the formulation was measured using a Brookfield viscometer at room temperature using an appropriate spindle and speed.

$$\text{Viscosity } (\eta) = \text{Torque} \times K / \text{RPM}$$

Where:

- η = viscosity (in Cp or mPa·s)
- Torque = Measured torque (in the unit provided by the viscometer, typically in dyne or equivalent)
- K = A constant provided by the viscometer manufacturer, which accounts for spindle geometry and the instrument's calibration.
- RPM = Rotational speed of the spindle

However, typical viscosity ranges for gel (which often include herbal hydrogel formulations) generally fall between: 1000 to 10,000 cP.

3.5.6 Washability

A small amount of cream was applied to the skin and washed with water to observe the ease of removal.

3.5.7 Extrudability

The cream was filled into a collapsible tube, and the ease of extrusion upon applying gentle pressure was evaluated.

3.5.8 Stability Study

The cream was stored under different temperature conditions (room temperature and refrigerated conditions) for a specified period and observed for changes in appearance, pH, color, odor, and phase separation.

3.5.9 Skin Irritation Test

A small quantity of cream was applied to a limited area of healthy skin and observed for 24 hours for any signs of redness, itching, or irritation.

IV. RESULTS AND DISCUSSION

Table -4: Evaluation Results of Formulations F1–F5

Parameter	F1	F2	F3	F4	F5
Colour	White	White	White	White	White
Odour	Pleasant herbal	Characteristic herbal	Mild, earthy	Mild herbal	Pleasant herbal
Texture	Smooth, thick	Smooth	Smooth, glossy	Smooth	Light, smooth
pH	5.8	5.5	6.0	5.7	5.5
Viscosity (cP)	23,400	22,500	19,500	20,200	18,800
Spreadability (g·cm/s)	22.3	20.2	24.3	22.8	26.3
Stability	Stable	Stable	Stable	Stable	Not Stable
Irritation	None	None	None	None	None
Homogeneity	Good	Good	Good	Good	Good
Washability	Moderate	Modrate	Easy	Easy	Easy
Phase separation	None	None	None	None	Observed

The five prepared formulations were uniformly smooth and homogeneous in texture, pale in colour, and free of grittiness, presenting a mild, characteristic herbal fragrance with no observable lumps or entrapped air, as summarized in Table -4.

The favourable overall performance observed across the formulations may be attributed to the complementary functional contributions of the constituent ingredients. Chia seed oil supplies essential fatty acids and polyphenolic antioxidants that support the lipid architecture of the skin barrier,

while aloe vera gel contributes polysaccharides and mucilaginous compounds that promote hydration and exert a soothing effect. Beeswax and cetostearyl alcohol function as co-emulsifying agents that stabilize the emulsion system and contribute to its overall consistency, borax facilitates emulsification while assisting in the maintenance of a skin-compatible pH, and methylparaben affords protection against microbial contamination. Notably, none of the five formulations produced erythema, oedema or any other indication of irritation during evaluation, suggesting that the combination of chia seed oil and aloe vera together with the selected excipients is well tolerated by the skin.

V. CONCLUSIONS

A herbal moisturizing cream incorporating chia seed oil and aloe vera was successfully developed and characterized across five candidate formulations. All batches demonstrated satisfactory physical stability, an absence of dermal irritation, and acceptable cosmetic properties, with pH values consistent with those of normal skin. Among the formulations evaluated, F2 exhibited the most favourable overall balance of viscosity, spreadability, homogeneity and stability, and is proposed as the optimized composition. These findings suggest that chia seed oil and aloe vera can be effectively combined to yield a stable, safe and economically viable herbal alternative to synthetic moisturizing creams for routine skin care. Additional investigation encompassing extended stability assessment, microbial limit testing and controlled user trials is recommended prior to consideration of the formulation for larger-scale development.

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