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DEVELOPMENT AND IN VITRO EVALUATION OF ALOEVERA MOISTURIZING CREAM

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Abstract:

The present study focuses on the formulation and evaluation of a moisturizing cream incorporating Aloe vera extract, known for its soothing, hydrating, and healing properties. The aim was to develop a safe, stable, and effective herbal cream for topical application to enhance skin hydration and maintain skin health. The cream was prepared using oil-in-water (O/W) emulsion technique with natural and synthetic ingredients such as stearic acid, cetyl alcohol, glycerin, and preservatives. Aloe vera gel was used as the primary active ingredient due to its excellent moisturizing, anti-inflammatory, and antimicrobial properties. The prepared formulation was subjected to various evaluation parameters including pH, viscosity, spreadability, homogeneity, stability, and skin irritation tests. The results indicated that the cream was smooth, non-greasy, stable over time, and had acceptable physicochemical properties. No signs of skin irritation were observed in volunteers during the study period. The moisturizing effect was also satisfactory upon application, indicating its potential use as a natural skincare product. The study concludes that Aloe vera-based moisturizing cream can be a promising herbal formulation for improving skin hydration and overall skin care due to its natural origin and minimal side effects.

Key words: *Aloe vera extract, Moisturizing cream, Glycerine, Vitamin E, Spread ability, Stability.*

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INTRODUCTION:

Traditional system of medicine is one of the centuries old practice and longserving companion to humankind in the fight against disease and in leading a healthy life. Indigenous people have been using the unique approach of their traditional system of medicine for centuries and among the most renowned are the Chinese, Indian, African systems of medicine [1]. Traditional medicine refers to any ancient and culturally based healthcare practice differing from scientific medicine and is largely transmitted orally by communities of different cultures.The World Health Organization (WHO) observes that it is difficult to assign one definition to the broad range of characteristics and elements of traditional medicine, but that a working definition is essential. [2] It thus concludes that the traditional medicines ‘‘[include] diverse health practices, approaches, knowledge and beliefs incorporating plant, animal and mineral based medicines, spiritual therapies, manual techniques and exercises applied singularly or in combination to maintain wellbeing, as well as to treat, diagnose or prevent illness.Several developed countries have a major proportion of the population that uses traditional practice of health, especially medicinal plants, and have taken steps to preserve its popularity for historical and cultural reasons.[3] Over the last decades the treatment of illness have been accomplished by administrating drugs to human body via various roots namely oral, sublingual ,rectal, parental ,topical ,inhalation etc. [4] Topical delivery can be defined as the application of a drug containing formulation to the skin to directly treat cutaneous disorder or the cutaneous manifestations of a general disease (eg. psoriasis) with the intent of containing the pharmacological or the effect of drug to the surface of the skin or within the skin semisolid formulations in all their diversity dominate the system for topical delivery, but foams, spray , medicated powders, solutions and even medicated adhesive systems are in use. [5]

MATERIALS AND METHODS:

Aloevera was collected as a gift sample from Synpharma Research Labs,Hyderabad and various excipients and polymers were purchased from Synpharma Research Labs, HYD

METHODOLOGY:

Fourier transform infrared spectroscopy [6]:

Fourier transform IR spectra were obtained on Shimadzu FT-IR spectrometer. Samples were prepared in KBr disks (2mg sample in 200mg KBr). The scanning range was 450-4000 cm^{-1} and the resolution was 4 cm^{-1}.

Extraction of Aloe vera gel:

First of all, we have to collect Aloe vera leaves from botanical garden and then washed with distilled water.Then we have to cut the outer part of leaf longitudinally with the help of knifeAfter that we removed colorless parenchymatous tissue and put it into beaker of 400 ml.Then we have to stir gel of Aloe vera with help of stirrer mixer.Then filtered it with help of muslin cloth to remove various types of impurities.At last cover beaker either by filter paper or with help of silver foil to prevent from microbial growth or any effect of environmental factor [7].

FORMULATION DEVELOPMENT:

Preparation of moisturizing cream:

Table-1: Formulation development

Ingredients (w/w)	F1	F2	F3	F4
Aloevera gel	1	1	1	1
Glycerin	2	2	2	2
Cetyl alcohol	1	2	3	4
Clove oil	1	1	1	1
Vitamin E (Capsule)	1	1	1	1
Methyl paraben	0.1	0.1	0.1	0.1
Water	q.s	q.s	q.s	q.s

Oil Phase Preparation [8]

- In a beaker, add stearic acid, cetyl alcohol, and clove oil.
- Heat the oil phase to **75–80°C** to completely melt all components.

Step 2: Aqueous Phase Preparation [9]

- In another beaker, dissolve aloevera gel in distilled water with constant stirring.
- Add glycerin, preservative, and vit E capsule and heat to 75–80°C (same as oil phase).

Step 3: Emulsification [10]

- Slowly add the hot oil phase into the hot aqueous phase with continuous stirring using a mechanical stirrer or homogenizer (5000–7000 rpm) for 10–15 minutes.

Step 4: pH Adjustment [11]

- Add triethanolamine dropwise to adjust the pH to around 5.5–6.0, which is skin-friendly and optimal for HA stability.

Step 5: Cooling and Fragrance Addition

- Allow the cream to cool to room temperature while stirring gently.

Step 6: Packaging [12]

- Transfer the cream into clean, sterile containers and label.

CHARACTERIZATION [13,14]:

physical properties:

The cream was observed for the colour, odour and appearance was taken in to consideration.

Washability:

The cream was applied on the hand and observed under the running water.

pH:

The pH meter was calibrated with the help of standard buffer solution. Weigh 0.5 gm of cream dissolved it in 50.0ml of distilled water and its p H was measured with the help of digital pH meter.

Viscosity:

Viscosity of the cream was determined with the help of Brookfield viscometer at 100 rpm with the spindle no7.

Spread ability test:

The cream sample was applied between the two glass slides and was compressed between the two-glass slide to uniform thickness by placing 100 gm of weight for 5 minutes then weight was added to the weighing pan. The time in which the upper glass slide moved

$$\text{Spreadability (S)} = M \times L / T$$

s=weight tight to upper slide l =length moved on the glass slide

t =time take

Homogeneity:

Homogeneity was tested via the visual appearance and test.

Stability Studies

The formulations stored in glass vials covered with aluminum foil were kept a t room temperature and in refrigerator (4◦C) for a period of 30 days.

RESULTS & DISCUSSION:

Physical Evaluation of Moisturizing cream:

Table-2: Physical Evaluation of Moisturizing cream

Parameters	F1	F2	F3	F4
Colour	Faint green	Faint green	Faint green	Faint green
State	Semi solid	Semi solid	Semi solid	Semi solid
Texture	Smooth	Smooth	Smooth	Smooth

Table-3: Evaluation parameters of Moisturizing cream

Formulation code	pH	Wash ability	Viscosity (cps)	Greasiness	Spread ability (g·cm/sec)
F1	6.2	6	38845	Greasy	263
F2	6.4	8	40258	No Greasy	248
F3	6.1	5	39674	No Greasy	250
F4	6.5	7	42367	Greasy	259

Physical Appearance:
The cream was smooth, homogeneous, non-greasy, with a pleasant odor and light green color.
No phase separation observed during 4-week stability testing.
pH Measurement:
pH of the cream was found to be in the range of 6.1–6.5 which is suitable for topical application and compatible with skin.
Viscosity:
The viscosity was found to be in the range of 38845 – 42367 cps, indicating good consistency and spreadability.
Wash ability:
The Wash ability value of the F3 Moisturizing cream was found to be 5%.
Spreadability:
The spreadability value of the F3 Moisturizing cream was found to be 250 g·cm/sec, suggesting easy and smooth application on skin.
Homogeneity:
The F3 formulation showed excellent homogeneity without any lumps, grittiness, or phase separation.
Stability Studies:
The cream was stable at room temperature and refrigerated conditions over 30 days
No discoloration, odor change, or microbial growth was observed.

CONCLUSION:

The present study was carried out to formulate and evaluate a herbal moisturizing cream containing Aloe vera gel as the key active ingredient. Aloe vera is known for its excellent moisturizing, soothing, anti-inflammatory, and skin-healing properties. The cream was prepared using standard oil-in-water emulsion techniques and evaluated for several physicochemical parameters including pH, spreadability, viscosity, homogeneity, and stability.The formulation was found to have desirable organoleptic and physical properties. The pH was within the range (6.1–6.5), The F3 formulation showed excellent homogeneity without any lumps, grittiness, or phase separation. The spreadability value of the F3 Moisturizing cream was found to be 250 g·cm/sec, suggesting easy and smooth application on skin. No phase separation, microbial growth, or degradation was observed during the stability study. The product was well-tolerated in preliminary skin irritation tests and showed enhanced skin moisturization over time.The Aloe vera moisturizing cream developed in this study demonstrated excellent physicochemical stability, aesthetic appeal, and moisturizing efficacy. The formulation is suitable for topical application and may serve as a safe, effective, and natural alternative to commercial moisturizers. With further in-depth studies and clinical trials, it can be developed into a commercial herbal skincare product.

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