



**“DEVELOPMENT, STANDARDIZATION AND PHYSICOCHEMICAL
EVALUATION OF HERBAL MOISTURIZING CREAM CONTAINING
ZIZIPHUS JUJUBA EXTRACT.”**

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ABSTRACT

Objective: To formulate a herbal moisturizing cream using Jujube fruit extract and other herbal ingredients. **Methods:** Jujube extract, Aloe vera, basil, and lavender were combined with excipients such as beeswax, liquid paraffin, borax, coconut oil, and vitamin E to create an oil-in-water herbal moisturizing cream. Jujube extract was produced through 48–72 hours of maceration with 70% ethanol. To create a cream, the oil and aqueous phases were heated independently to 75°C and combined while being constantly stirred. The pH, spreadability, viscosity, washability, phase separation, irritancy, and stability of three formulations (F1–F3) were created and assessed. **Results:** Among the prepared three batches of herbal moisturizing cream, formulation F2 showed optimal physicochemical properties with pH 6.38, good spreadability (28.3 g.cm/s), and viscosity of 39416 cps, which lies within acceptable limits. All formulations showed no phase separation, good washability, and no skin irritation during evaluation. Stability studies indicated that the formulations remained physically stable for 30 days without significant changes in colour, odour, pH, and spreadability. Among them, F2 was found to be the most stable and suitable formulation compared to the other batches. **Conclusion:** The formulated herbal moisturizing cream containing Jujube extract was found to be stable, safe, and effective. The formulation exhibited good physicochemical properties,

skin compatibility, and moisturizing potential. Among all batches, F2 demonstrated better stability and overall performance. The study supports the use of herbal ingredients in cosmetic formulations as a safer alternative to synthetic products.

KEYWORDS: Herbal cream, Ziziphus jujuba, Moisturizer, Phytocosmetics, Stability study, Water-in-oil emulsion.

INTRODUCTION

Due to the lack of herbal cosmetics, the need for cosmetics is typically increasing. The public is becoming more aware of herbal phrasings because to their superior packages and inferior side products. It also gives the skin the moisture and nutrition it needs. The herbal cream is essentially a water-in-oil artwork. An Asian decorative that can give skin a golden glow is holy basil. Additionally, it has antibacterial and anti-inflammatory qualities.

Creams are semi-solid drugs that comprise one or more medicinal ingredients dissolved or disseminated in a water-in-oil painting mixture, an oil painting-in-water mixture, or another kind of water-washable basis. Cream falls into two categories: water in oil painting and oil painting in water. A skin cream's primary purpose is to protect the skin from various environmental factors and precipitation while also calming the skin. Cold, sanctified, evaporating, foundation, massage, night, hand, and body creams are the common categories of creams. These three natural components aloe vera are utilized in our treatment. Desquamation enables the replacement of damaged cells with healthy ones. When skin moisture drops below the typical 10%, the skin becomes dry, rough, and develops a thin scale. Dehydration of the stratum corneum is the primary cause of xerosis, or dry skin. Overexposure to water, harsh soaps or irritants, and the environment can all lead to dehydration^[1]

Physiology of human skin:

Dermis: The layer of skin beneath the epidermis is called the dermis. It is composed of connective tissue, which is rich in collagen and elastic fibers. Blood arteries, nerves, hair follicles, and glands including perspiration and oil glands are all found in this layer. The skin's strength and suppleness come from the dermis. Fibroblasts, macrophages, and mast cells are its three primary cell types. There is a layer of loose tissue (Areolar tissue) and varying levels of fat (Adipose tissue) beneath the dermis.

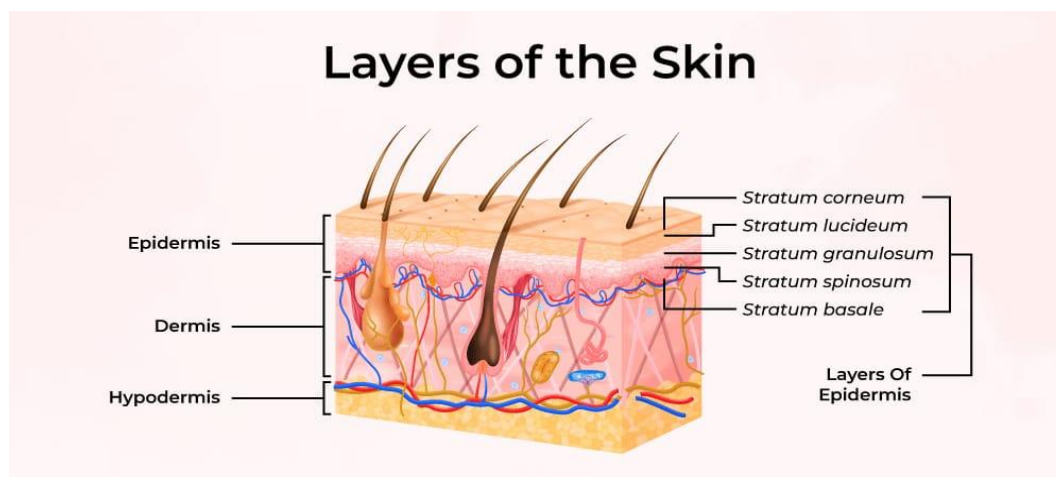


Fig. No. 1: Layers of The Skin.

Epidermis

The outermost layer of skin, known as the epidermis, is primarily composed of keratinocytes. It contains immune cells, helps regulate water loss, and shields the body from the environment. There are no blood vessels or nerve endings in the epidermis, but the deeper layers get oxygen and nutrients from the fluid in the dermis below, which is then removed as lymph.

Subcutaneous: Subcutaneous glands, also known as subcutaneous adipose tissue or hypodermis, are located immediately beneath the dermis, the outermost layer of skin. They are composed of fat cells and aid in cushioning, energy storage, and body warmth. Sebaceous glands function independently and secrete oil (sebum) directly onto the skin's surface in regions where multiple types of skin converge, such as the lips, eyelids, nipples, labia minora, and glans penis.

Cream: Cream is a semi-solid emulsion of water and oil. Tiny oil droplets are dispersed throughout a continuous water phase in oil-in-water (O/W) creams, whereas tiny water droplets are dispersed throughout a continuous oily phase in water-in-oil (W/O) creams. Because water-in-oil creams create an oily barrier that prevents water loss from the stratum corneum, the skin's outermost layer, they are also more moisturizing.^[2]

Classification of cream: Types of creams according to function, characteristic properties and type of emulsion: Make-up cream (o/w emulsion):

- 1) a) Vanishing creams.
 - b) Foundation creams.
- 2) Cleansing cream, cleansing milk, Cleansing lotion (w/o emulsion).

- 3) Winter cream (w/o emulsion) Cold cream or moisturizing creams.
- 4) All-purpose cream and general creams.
- 5) Night cream and massage creams.
- 6) Skin protective cream

Moisturizing cream:

The water-in-oil emulsion is moisturizing cream. Compared to other semisolid dosage forms or formulations, moisturizing cream provides a longer contact duration at the application site.

They make skin seem elegant and less oily. The ideal qualities of a moisturizer It shouldn't be toxic or annoying.

It ought to be non-allergic and non-inflammatory.

It should feel good when applied and be simple to apply to the skin.

Instead of leaving the skin feeling sticky, it should be able to leave it feeling soft.^[2]



Fig. No. 2: Moisturizing Cream.

Uses of moisturizers:

Moisturizers have a number of significant applications. They help relieve dry or irritated skin, protect it by sealing in moisture, and keep the skin hydrated. These are a few typical applications for moisturizers.

Hydration: To keep the skin from becoming dry, they apply water.

Barrier protection: They form a barrier that prevents the skin from drying out and retains moisture.

Skin Smoothing: Calming components like chamomile or aloe vera found in some moisturizers help reduce inflammation.

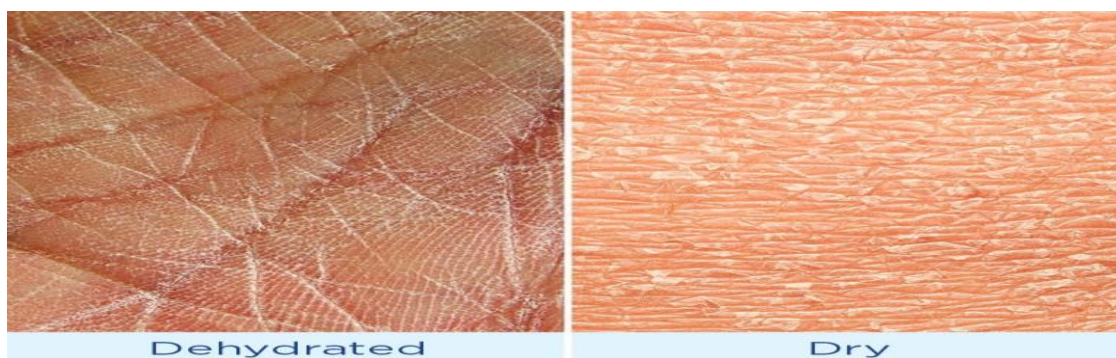


Fig. No. 3: Dehydrated and Dry Skin.

Advantages:

1. The primary benefit of using a herbal moisturizer is that it improves dry skin without causing any negative side effects.
2. It lessens the likelihood of future skin issues.
3. This moisturizer helps prevent wrinkles.
4. Less oily than other ointments
5. Moisturizing keeps your skin looking fresh.
6. Compared to synthetic cosmetics, they are particularly effective when used in modest quantities.^[3]

MATERIALS AND METHOD

Table No 1: List of Ingredients.

Sr. No	INGREDIENT	ROLE
1	Jujuba Fruits	It is used to increase moisture content.
2	Lavender	It is used as anti-bacterial and anti-inflammatory agent.
3	Aloe-Vera	It is used for softening of the skin.
4	Holy Basil	It is used as anti-bacterial, anti-inflammatory and anti-septic agent.
5	Bees Wax	It repairs damage, promotes the Skin regeneration and create hydration.
6	Borax	It is added to remove bacteria And dead skin cells
7	Mustard Oil	It is use as preservative.
8	Liquid Paraffin	It is used as a moisturizing agent to prevent dry, rough scalp, itchy skin
9	Coconut oil	It is helping in healing wounds.
10	Vitamin E	It is used as antioxidant
11	Jasmine Oil	It is used for fragrance
12	Guar Gum	It is used as emulsifier
13	NaOH	Regulate Ph of formulation

METHODOLOGY

Extraction process of jujube for herbal cream

- 1) Bioactive substance extraction (maceration extraction)
- 2) Extraction of Ethanol (Most Common)
 - In a 1:10 (w/v) ratio, combine the powdered Jujube fruit with 70% ethanol.
 - Store the mixture in an airtight container and give it a little shake.
 - Let it macerate at room temperature for 48 to 72 hours.
 - Use Whatman filter paper or muslin cloth to filter the extract.

To create a semi-solid or dry extract, evaporate the ethanol at low temperatures (<50°C) using a rotary evaporator or water bath. Evaporate the ethanol using a rotary evaporator or water bath at low temperatures (<50°C) to obtain a semi-solid or dry extract.

Preparation of Final Moisturizing Cream:

- **Oil Phase:**
 - Heat liquid paraffin and bees wax in a beaker at 75°C.
- **Water Phase:**
 - To obtain a clear solution, dissolve borax and methyl paraben in distilled water in a separate beaker and boil it to 75°C.
 - Add this aqueous phase to the heated oily phase gradually.
 - After adding a little amount of jujube, lavender, aloe vera, and basil extracts and rapidly stirring until a smooth cream forms, add vitamin E, coconut oil, jasmine oil for scent, and triethanolamine as a neutralizing agent. This cream will next be packaged and stored.^[4]

Table No. 2: Formulation Table of Moisturizing Cream from jujube extract.

Sr. No	Ingredients	F1 (35gram)	F2 (40gram)	F3 (50gram)
1	Jujube extract	2gm	2gm	3gm
2	Lavender oil	1ml	2ml	2ml
3	Aloe-vera Extract	5ml	8ml	10ml
4	Basil extract	2gm	2gm	2gm
5	Bees wax	5gm	5gm	5gm
6	Liquid paraffin	15ml	20ml	25ml
7	Borax	1gm	0.5gm	1gm
8	Mustard Oil	0.1ml	0.1ml	0.1ml
9	Coconut oil	1ml	1ml	1ml
10	Jasmine oil	1m	1ml	1ml
11	Vitamin E	1ml	1ml	1ml
12	NAOH	1ml	1ml	1ml
13	Water	QS	QS	QS

Evaluation:**• Evaluation of Moisturizing Cream****I. pH**

A digital pH meter was used to measure the pH after 0.5g of cream was dissolved in 50 ml of distilled water.

II. Distinguishing Phases

This test is essentially examined within 24 to 30 hours. This test cream should be kept between 30 and 80 degrees Celsius in a closed container. This formulation should not be exposed to light.

III. Test for Spreadability

Use a specific load to remove two slides from the cream that is positioned in between the slides. Better spreadability is achieved when two slides are separated in less time.

$$S = M.L/T$$

- M is the weight attached to the upper slide.
- S is the amount of time needed to divide the slides.
- L = Glass slide length

IV. Washability

Washing with tap water made it simple to remove the cream that had been put to the skin.

V. Test of Irritability

Studies reveal no signs of redness, oedema, irritation, or inflammation using the designed lotion. The cream's formulation is safe to use.

VI. Viscosity

- A Brookfield viscometer was used to measure the cream's viscosity at a temperature of 25°C causing spindle number 64 at 20 rpm.
- Physical evaluation: This is mostly used to assess the color and smell of the cream.^[4]

RESULTS AND DISCUSSION

Table No. 3: Phytochemicals Test.

Sr. No	Test Performed	Result
1.	Water solubility	Present
2.	Shinoda test	Present
3.	Sodium Hydroxide	Present

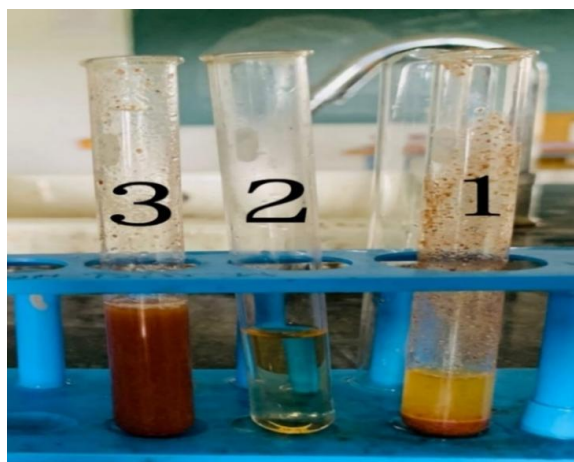


Fig. No. 6: Phytochemicals Test.

Evaluation Parameters

Table No. 4 A) Organoleptic Properties.

Sr. No	Evaluation parameter	Observations
1	Colour	Brownish Yellow
2	Odour	Aromatic

Discussion

Acceptable organoleptic qualities were indicated by the sample's brownish-yellow color and fragrant scent. These features support the sample's overall quality and imply the presence of natural ingredients.

Table No. 5 B) Physicochemical Properties.

Sr. No.	Evaluation Parameter	F1	F2	F3
1	pH	7	6.38	6.8
2	Phase separation	No	No	No
3	Spreadability	24.5 g.cm/s	28.3 g.cm/s	21.1 g.cm/s
4	Washability	Good	Good	Good
5	Irritancy	No	No	No
6	viscosity	48205cp	39416cp	37832cp

1) Determination of pH

Discussion

The moisturizing cream compositions' pH values (F1: 7.0, F2: 6.38, and F3: 6.8) are all within the skin-friendly range (5.5-7.0). This means that none of the formulations are anticipated to cause irritation and are appropriate for topical use. Overall, the pH readings indicate good compatibility with the skin, while the modest variances between the formulations are acceptable and might be caused by differences in components.



Fig. No. 7: pH.

2) Phase Separation

Discussion

Good physical stability was indicated by the absence of phase separation in all three formulations (F1, F2, and F3). The fact that there is no discernible separation indicates that the formulations are consistent throughout time and the components are compatible. Because it indicates appropriate emulsification and dispersion and indicates improved performance and shelf life, this stability is desirable.



Fig. No. 8: Phase Separation.

3) Spreadability

Discussion

All of the herbal moisturizing cream formulations spread smoothly on the skin, according to their spreadability values (F1: 24.5 g cm/s, F2: 28.3 g.cm/s, and F3: 21.12 g.cm/s). F2

exhibits the maximum spreadability of all of them, indicating more uniform dissemination and simpler application. Additionally, F1 and F3 show respectable spreadability, indicating that all formulations are easy to use and appropriate for topical application.



Fig. No. 9: Spreadability.

4) Washability

Discussion

All three formulas showed good washability, according to the data. Each sample (F1, F2, and F3) was readily removed with water, demonstrating consistency in the formulation's quality and skin-friendliness.

5) Skin Irritation

Discussion

During examination, none of the three moisturizer formulations (F1, F2, and F3) displayed any indications of skin irritation. Each formulation is dermatologically safe for topical treatment if there is no redness, itching, or discomfort.

Since none of the samples produced irritation, all three can be considered suitable for further studies or consumer use. This result suggests that the ingredients used are well-tolerated and compatible with the skin.

6) Viscosity

Discussion

There is discernible variance in the viscosity evaluation of the three formulations (F1, F2, and F3), demonstrating variations in the texture and consistency of each herbal cream. Formulation F1 had the maximum viscosity (48205 cP), indicating a richer and thicker consistency that might have more potent moisturizing and occlusive effects. F2 (39416 cP) has a rather thick texture that strikes a balance between hydration and spreadability. F3

exhibits the lowest viscosity (37832 cP), suggesting a cream that is lighter and easier to spread. These differences in viscosity

7) Stability Analysis

Formulation F2 exhibits superior stability outcomes. It is the most stable formulation out of the three since it has a steady skin-friendly pH, good spreadability, consistent viscosity, no irritation, and no phase separation.

Table No. 6: Stability Testing of Moisturizing Cream.

Sr. No.	Evaluation parameter	0 Day	15 Days	30 Days
1	Colour	Brownish	Brownish	Brownish
2	Odour	Aromatic	Aromatic	Aromatic
3	pH	6.38	6.31	6.12
4	Phase Separation	No	No	No
5	Spreadability	24.5 g.cm/s	22.3 g.cm/s	23.47 g.cm/s
6	Washability	Good	Good	Good
7	Irritancy	No	No	No

DISCUSSION

The creation and assessment of a herbal moisturizing cream utilizing organic components recognized for their skin-beneficial qualities was the main focus of this investigation. The proposed formulation demonstrated favorable physicochemical properties, suggesting that topical use might be appropriate. The cream's smooth texture, high homogeneity, and acceptable consistency are crucial factors for patient compliance and application convenience. The stability and even dispersion of constituents in the formulation were further validated by the lack of phase separation and grittiness.

The produced cream's pH was found to be within the typical skin pH range (about 5.5–7), indicating that it is safe for frequent usage and does not cause irritation. Studies on spreadability and viscosity revealed that the cream had good flow characteristics, making it simple to apply over the skin's surface without causing too much friction. These characteristics are essential for improving user acceptance and guaranteeing consistent medication or active component delivery.

The formulation's medicinal efficacy is greatly enhanced by the addition of herbal components. It is well recognized that natural ingredients like plant oils and extracts have calming, anti-inflammatory, hydrating, and antioxidant properties. These characteristics aid in preserving skin hydrated, shielding the skin from environmental harm, and enhancing

general skin health. Herbal creams are a safer option for long-term use because they often have fewer adverse effects than synthetic preparations.

In summary, the created herbal moisturizing cream proved to be safe, stable, and effective for topical use, and it showed satisfactory assessment criteria. The study backs up herbal formulations' potential as viable substitutes for traditional cosmetics. However, more research is advised to determine long-term efficacy and consumer acceptance, including *in vivo* evaluation and clinical trials.

CONCLUSION

A natural moisturizing lotion that satisfied the necessary pharmaceutical requirements was successfully formulated and evaluated utilizing herbal ingredients. Based on the study's findings, jujube fruit and aloe vera were examined for their capacity to both hydrate and lessen dry skin. This ointment was found to be an effective skin moisturizer. All two formulations, F1 and F2, are stable, effective, non-toxic, and appropriate for use on the skin, according to the results.

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