

TO FORMULATE AND EVALUATE A HERBAL MOISTURIZING CREAM USING NATURAL PLANT EXTRACTS AND OILS FOR SKIN HYDRATION AND PROTECTION

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Abstract

The present study was carried out to formulate and evaluate an herbal moisturizing cream using natural plant extracts and oils for skin hydration and protection. The formulation contained *Tagetes erecta* (Marigold), *Aloe barbadensis* Miller (Aloe vera), coconut oil, Vitamin E, bees wax, jasmine oil, and licorice, which possess moisturizing, antioxidant, soothing, and skin-protective properties. The cream was prepared by suitable heating and mixing methods and evaluated for appearance, odor, homogeneity, pH, spreadability, washability, and irritancy. The results showed that the formulation had a smooth texture, good spreadability, acceptable pH, and satisfactory stability. No signs of skin irritation were observed during the irritancy study. The study concluded that the formulated herbal moisturizing cream is safe, stable, and effective for maintaining skin hydration and protecting the skin from dryness.

INTRODUCTION:

Skin is the largest organ of the human body and acts as a protective barrier against external environmental factors. Dry skin (xerosis) is a common skin condition caused by reduced moisture content and impaired skin barrier function.

Increased transepidermal water loss (TEWL) leads to roughness, flaking, itching, irritation, and cracking of the skin. Proper hydration is essential to maintain healthy, smooth, and elastic skin.

Figure No.1. Overview of Skin.



Moisturizers:

Moisturizers are topical preparations used to restore and maintain skin hydration. They reduce water loss from the skin and improve skin softness and elasticity. Herbal moisturizers are preferred because they provide nourishment and protection with minimal side effects.

The ideal characteristics of a Moisturizer:

1. Should provide adequate hydration to the skin.
2. Should prevent excessive moisture loss from the skin.
3. Should maintain skin softness, smoothness, and elasticity.
4. Should be non-greasy and non-sticky in nature.
5. Should spread easily and be readily absorbed by the skin.

Mechanism of Action of Herbal Moisturizer

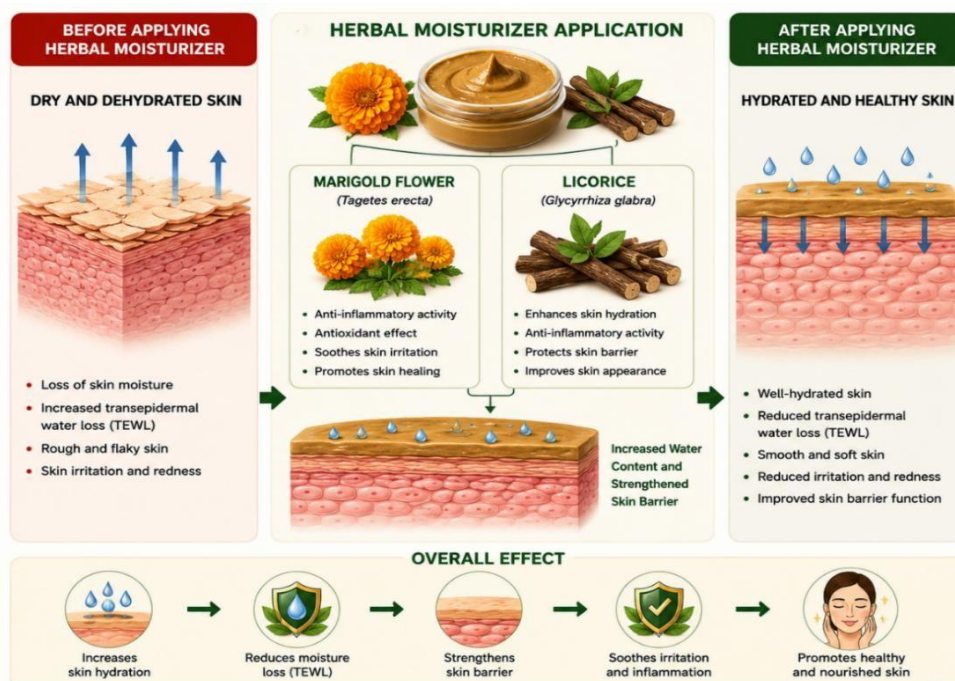


Figure No.2. Herbal Moisturizer Application

Advantages of Herbal Moisturizer

1. Provides effective hydration and nourishment to the skin.
2. Helps prevent dryness and moisture loss.
3. Improves skin softness, smoothness, and elasticity.
4. Contains natural ingredients with minimal side effects

MATERIAL AND METHOD



Figure No.3 - *Tagetes erecta* flower

1. *Tagetes erecta* (Marigold)

Tagetes erecta (Marigold) belongs to the family Asteraceae. It contains flavonoids, carotenoids, triterpenoids, saponins, tannins, and essential oils that contribute to its therapeutic properties. Marigold exhibits antioxidant, anti-inflammatory,

antimicrobial, and wound-healing activities. In herbal moisturizers, it helps improve skin hydration, reduce skin irritation, protect the skin from dryness, and promote healthy and nourished skin.



Figure No.4- *Glycyrrhiza glabra* roots

2. *Glycyrrhiza glabra* (Licorice)

Glycyrrhiza glabra (Licorice) belongs to the family Fabaceae. It contains glycyrrhizin, flavonoids, saponins, and phenolic compounds that contribute to its therapeutic properties. Licorice exhibits antioxidant, anti-inflammatory, and skin-soothing activities. In herbal moisturizers, it helps improve skin hydration, reduce irritation, protect the skin from dryness,

and enhance overall skin health and texture.

3. Aloe Vera Gel

Aloe vera gel is a natural mucilaginous substance obtained from the leaves of *Aloe barbadensis* Miller. It helps maintain skin hydration, improves the texture and spreadability of the cream, and provides a cooling effect to the skin. Aloe vera gel

protects the skin from dryness and irritation while enhancing the stability of the formulation.

4. Coconut Oil

Coconut oil is a natural oil obtained from the kernel of *Cocos nucifera* L. and is widely used in herbal moisturizing creams due to its moisturizing and emollient properties. It helps keep the skin soft, smooth, and hydrated, prevents moisture loss, improves the texture and spreadability of the cream, and provides nourishment and protection to the skin.

5. Jasmine Oil

Jasmine oil is a natural essential oil obtained from the flowers of *Jasminum officinale* L. It is widely used in herbal moisturizing creams for its pleasant fragrance and skin-conditioning properties. It improves the aroma and acceptability of the formulation while helping to soothe, soften, and nourish the skin.

6. Vitamin E

Vitamin E is a fat-soluble vitamin widely used in cosmetic formulations due to its antioxidant and skin-protective properties. In herbal moisturizing creams, it helps protect the skin from oxidative damage, improves hydration and softness, and enhances the stability and shelf life of the formulation.

7. Propyl Paraben

Propyl paraben is an antimicrobial preservative commonly used in cosmetic and pharmaceutical formulations. In herbal moisturizing creams, it prevents the growth of microorganisms, thereby improving the safety, stability, and shelf life of the product.

8. Sandalwood Powder

Santalum album, commonly known as sandalwood, belongs to the family

Santalaceae. It is widely used in herbal and cosmetic preparations due to its cooling, soothing, anti-inflammatory, and antimicrobial properties. In herbal moisturizing creams, it helps soothe irritated skin, reduce dryness, and improve overall skin appearance.

9. Beeswax

Beeswax is a natural wax obtained from honeycombs and is widely used in herbal moisturizing creams due to its thickening, emulsifying, and skin-protective properties. It helps maintain the consistency and stability of the formulation, improves texture and spreadability, prevents moisture loss, and forms a protective barrier on the skin.

Preparation of *Tagetes erecta* Flowers Ethanolic Extract

1. About 100 g of coarsely powdered *Tagetes erecta* flowers was transferred into a clean beaker.
2. Approximately 1000 ml of 75% ethanol was added and mixed properly.
3. The mixture was kept for 24 hours at room temperature with occasional stirring for extraction.
4. The extract was filtered through muslin cloth followed by Whatman filter paper.
5. The filtrate was concentrated on a water bath to obtain a semisolid extract, which was stored in an airtight container for further use.



Figure No.4- *Tagetes Erecta* Flowers Ethanolic Extract

Preparation of Herbal Moisturizer Formulation

1. Required quantity of beeswax and coconut oil were accurately weighed and heated properly to prepare the oil phase.
2. Further, aqueous phase was prepared separately by mixing aloe vera gel and *Tagetes erecta* extract and licorice powder properly.
3. After complete mixing, accurately weighed quantity of jasmine oil, sandalwood powder, and Vitamin E were added slowly and mixed properly to obtain a uniform mixture
4. Then, both oil phase and aqueous phase were mixed together by using mortar and pestle for proper mixing and formation of moisturizer formulation.
5. Finally, the prepared moisturizer formulation was transferred into suitable airtight containers and stored for further evaluation.



Figure No. 5 –Formulated Herbal Moisturizer

• **Formulation Table**

Table no.1- Formulation table

1	Bees Wax	1.2 g	1.4 g	1.6 g	1.8 g	1.8 g
2	Coconut Oil	2 g	2.4 g	2.8 g	3.2 g	3.2 g
3	Aloe Vera Gel	14.2 g	12.92 g	11.96 g	11.16 g	11.16 g
4	Marigold Extract	1.6 g	1.8 g	2 g	2 g	2 g
5	Glycyrrhiza glabra Extract	0.9 g	1 g	1 g	1 g	1 g
6	Sandalwood Powder	—	0.3 g	0.4 g	0.4 g	0.4 g
7	Vitamin E	0.1 g	0.1 g	0.2 g	0.2 g	0.2 g
8	Propyl Paraben	—	0.04 g	0.04 g	0.04 g	0.04 g
9	Jasmine Oil	1 drop	2 drops	2 drops	2 drops	2 drops
10	Total Weight	20 g	20 g	20 g	20 g	20 g

• **Evaluation Parameters Test for Herbal Moisturizer**

1. Physical Evaluation

Physical parameters such as colour, odor, consistency, appearance and texture were checked visually.

• **Colour:**

The colour of moisturizer formulations was checked by visual inspection.

• **Odor:**

The odor of moisturizer formulations was checked directly by smelling the formulations.

• **Appearance:**

The appearance of moisturizer formulations was observed visually for smoothness, homogeneity and absence of lumps.

• **Consistency:**

The consistency of moisturizer formulations was checked manually by applying on the skin.

• **Texture:**

The texture of moisturizer formulations was evaluated for smoothness and spreadability.

2. pH Determination

The pH of moisturizer formulations was determined using a digital pH meter. About 1 gm of formulation was dissolved in 10 ml distilled water and kept aside for 2 hours.

3. Spreadability Test

The spreadability of moisturizer formulations was determined by applying a small quantity of formulation on glass slide and observing the ease of spreading uniformly on the surface.

4. Washability Test

The washability of moisturizer formulations was evaluated by applying the formulation on the skin and washing with tap water. The ease of removal of formulation was observed visually.

5. Irritancy Test

The irritancy test was carried out by applying a small amount of formulation on the skin surface and observing for redness, itching or irritation for a specific period of time.

6. Homogeneity Test

The homogeneity of moisturizer formulations was evaluated visually by checking the uniform distribution of ingredients and absence of aggregates or phase separation.

7. Viscosity Test

The viscosity of moisturizer formulations was determined using a Brookfield Viscometer. The

formulations exhibited appropriate viscosity, indicating good consistency, stability, and spreadability for topical use.

8. Microbial Limit Test

The microbial quality of moisturizer formulations was evaluated using standard microbiological methods. No microbial growth was observed, indicating good microbiological safety of the formulations.

RESULT AND DISCUSSION

- Identification test for *Tagetes erecta*

Table No.2 - Identification test for *Tagetes erecta*

Sr. No.	Test for	Test	Observations
1)	Saponins	A] Foam Test	Stable persistent foam was observed
		B] Potassium Dichromate Test	Yellow colour precipitate was observed
2)	Flavonoids	A] Shinoda Test	Pink to red colour was observed
		B] Lead Acetate Test	Yellow colour precipitate was observed



Figure No .6- Identification test of *Tagetes erecta*

Evaluation Parameters of Moisturizer

1. Physical Evaluation test

Table no.3 - Physical Evaluation test

Sr. No.	Evaluation Parameter	Observation	Result
1)	Colour	Light yellowish cream colour	Acceptable
2)	Odor	Pleasant characteristic odor	Acceptable
3)	Appearance	Smooth and homogeneous	Good
4)	Consistency	Semi-solid consistency	Good
5)	Texture	Smooth and non-gritty	Good

2. pH Determination

Table no.4- Measurement of pH of all Batches

Sr. No.	Formulation Code	pH Observed	Result
1)	F1	4.00	Acidic
2)	F2	9.18	Neutral
3)	F3	11.00	Slightly Alkaline
4)	F4	6.20	Alkaline
5)	F5	7.00	Slightly Acidic

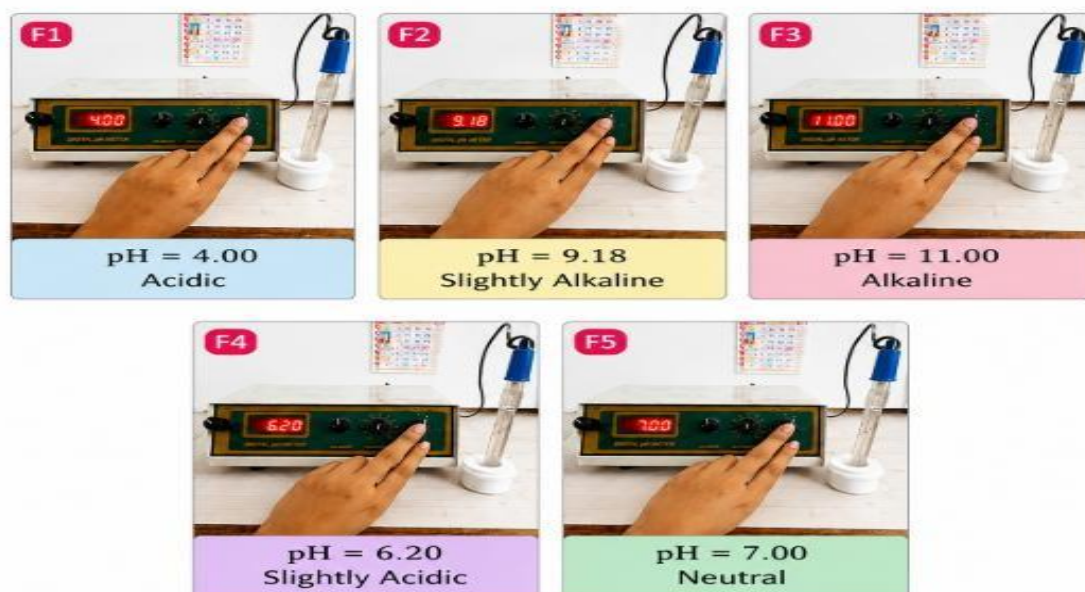


Figure No. 7 – Measurement of pH

3. Spreadability Test

Table no.5 - Spreadability Test

Sr. No.	Formulation Code	Time Taken (sec)	Observation
1	F1	11 sec	Moderate Spreadability
2	F2	9 sec	Good Spreadability
3	F3	7 sec	Good Spreadability
4	F4	5 sec	Excellent Spreadability
5	F5	4 sec	Excellent Spreadability

The prepared herbal moisturizer formulations showed good spreadability and were easy to apply on the skin. Among all batches, F4 and F5 showed excellent spreadability.

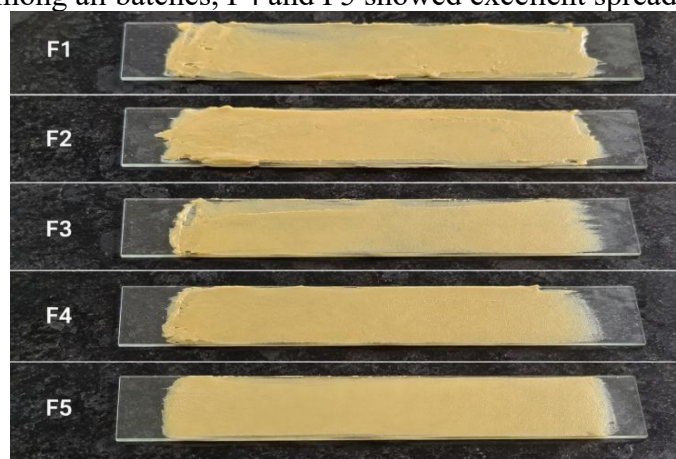


Figure No. 8: Spreadability Test

4. Washability Test

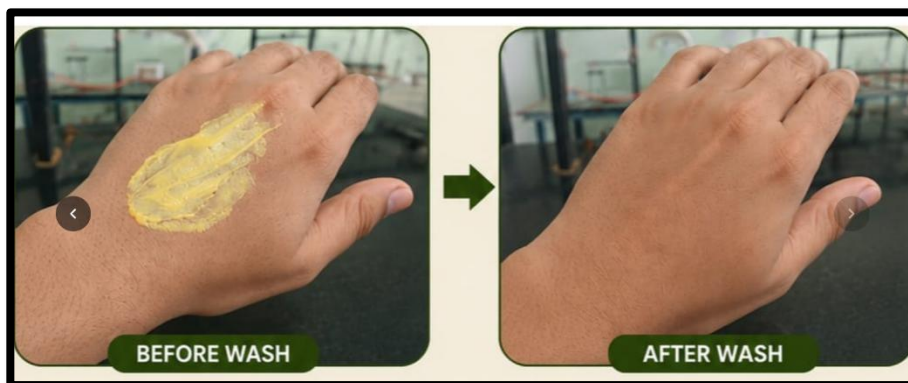


Figure No. 9: Washability Test Result

5. Homogeneity and Irritancy Test

Sr. No.	Evaluation Test	Procedure	Observation	Result
	Homogeneity Test	A small quantity of moisturizer was taken on a clean glass slide and spread gently using spatula/finger. The formulation was	Smooth and uniform texture was observed without lumps or coarse particles.	The formulation showed good homogeneity.
		observed visually for smoothness and uniformity.		
	Irritancy Test	A small amount of moisturizer formulation was applied on the skin surface of hand and kept for few minutes. The applied area was observed for redness, itching, irritation, or swelling.	No redness, irritation, itching, or swelling was observed on the skin.	The formulation was found to be non-irritant and safe for topical application.

6. Viscosity Test

Batch Code	Viscosity (cP)	Observation
F1	10,850 ± 120	Good consistency
F2	11,920 ± 135	Smooth texture
F3	13,480 ± 145	Uniform and stable formulation
F4	15,760 ± 110	Good spreadability and consistency
F5	16,320 ± 105	Excellent texture and stability



Figure No.10.Viscosity Test Result

7. Microbial Limit Test

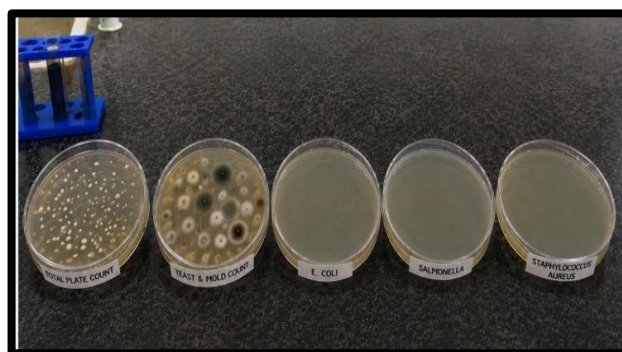


Figure No. 11 Microbial Test Result

Result: No visible microbial growth was observed in the formulations during the study period, indicating good microbiological quality and safety.

• Conclusion

The present study was carried out to formulate and evaluate an herbal moisturizer using natural ingredients such as Aloe vera gel, Marigold extract, Bees wax, Coconut oil, Vitamin E, Jasmine oil, Sandalwood powder, and Licorice extract. The prepared formulations were evaluated for various parameters including colour, odor, pH, homogeneity, spreadability, washability, irritancy, viscosity, microbial limit test, and stability. The formulations showed

satisfactory results with good consistency, stability, and skin compatibility. Among all formulations, F4 and F5 were found to be the optimized batches due to their better overall performance. The study concluded that the formulated herbal moisturizer is safe, effective, and suitable for topical application.

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