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Research Article

Formulation And Evaluation of Herbal Cream of Crude Drug

Megha Awatade*, Sarika Waghmode, Vidya Takmoge, Shailesh Pendor

Shri Ganpati Institute of Pharmaceutical Sciences and Research, Tembhurni -413211.

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ABSTRACT

The development of multipurpose creams has gained significant attention due to their convenience and multifunctional benefits. This study focuses on the formulation and evaluation of a multipurpose cream designed to provide moisturization, sun protection, and anti-aging effects. The cream was prepared using natural and synthetic ingredients, including emollients, humectants, surfactants, antioxidants, and broad-spectrum UV filters. The formulation was optimized using emulsion technology, and its physicochemical properties (pH, viscosity, spreadability, and stability) were evaluated. In vitro assessments, including sun protection factor (SPF) determination, moisturizing efficacy, and antioxidant activity, were conducted. The results indicated that the formulated cream exhibited good stability, desirable texture, effective hydration, and moderate UV protection. This study demonstrates the successful development of a stable, safe, and efficacious multipurpose cream that combines skincare benefits, making it a promising product for daily use. Further in vivo studies are recommended to validate its long-term effects. (7).

INTRODUCTION

The increasing awareness about the side effects of synthetic chemicals used in skincare products has led to a growing interest in herbal and natural remedies. Herbal creams, formulated using plant extracts and essential oils, offer a safe, effective, and eco-friendly alternative to chemicalbased products. A Multipurpose Herbal Cream is designed to provide a wide range of skin benefits, such as moisturizing, healing, protection against

infections, and soothing inflammation, all in one formulation. The rich biodiversity of medicinal plants like Aloe Vera, Neem (Azadirachta indica), Turmeric (Curcuma longa), and Sandalwood (Santalum album) has been utilized traditionally in Ayurveda and other ancient medicinal systems for treating various skin ailments. Combining such ingredients into a single cream enhances their synergistic effects, offering multiple benefits through natural means. Today, multipurpose herbal creams are seen not only as therapeutic

*Corresponding Author: Megha Awatade

Address: Shri Ganpati Institute of Pharmaceutical Sciences and Research, Tembhurni -413211.

Email : meghaaawatade@gmail.com

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agents but also as essential components of regular skincare routines. Their rising popularity is attributed to their minimal side effects, costeffectiveness, and the growing global shift towards organic and sustainable living. (10)



Fig Name- Herbal cream

Need for Herbal Multipurpose Creams

- Reduced Chemical Exposure: Decreases the risk of skin allergies, irritation, and longterm damage caused by harsh chemicals.
- Therapeutic Properties: Herbs used in these creams often possess antibacterial, antifungal, anti-inflammatory, antioxidant, and wound-healing properties.
- Environmentally Friendly: Plant-based formulations are biodegradable and reduce the carbon footprint.
- Cultural and Traditional Value: Many herbal ingredients have been trusted for centuries across different cultures.

Thus, developing a multipurpose herbal cream aligns with modern needs for safe, sustainable, and effective skincare solutions. *(19)

Types of Herbal Creams

Herbal creams can be categorized based on their primary action and intended use:

1. Moisturizing Herbal Creams

Aim: To hydrate and nourish the skin.

Common Ingredients: Aloe vera, honey, almond oil, shea butter.

2. Antiseptic and Healing Herbal Creams

Aim: To heal wounds, cuts, burns, and prevent infections.

Common Ingredients: Turmeric, neem, tea tree oil, calendula

3. Anti-inflammatory and Soothing Herbal Creams

Aim: To reduce skin inflammation, redness, and irritation.

Common Ingredients: Chamomile, licorice root, aloe vera.

4. Anti-aging Herbal Creams

Aim: To reduce signs of aging like wrinkles, fine lines, and loss of elasticity.

Common Ingredients: Ginseng, green tea extract, rosemary.

5. Sun-protective Herbal Creams

Aim: To protect the skin from harmful UV rays naturally.

Common Ingredients: Carrot seed oil, red raspberry seed oil, coconut oil.

6. Skin Lightening and Brightening Herbal Creams

Aim: To even skin tone, reduce hyperpigmentation.

Common Ingredients: Turmeric, lemon extract, licorice extract, bearberry.

7. Multipurpose Herbal Creams



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Aim: To combine multiple benefits like moisturizing, healing, soothing, and protection into a single formulation.

Common Ingredients: A blend of moisturizing, healing, and protective herbs.

Classification Based on Herbal Ingredient Types

1. Based on Source

Leaf Extracts: Neem, Aloe Vera, Basil.

Root Extracts: Turmeric, Licorice.

Bark Extracts: Sandalwood, Cinnamon.

Flower Extracts: Calendula, Rose.

Fruit Extracts: Lemon, Papaya.

2. Based on Activity

Antibacterial: Neem, Tea Tree Oil.

Antioxidant: Green Tea, Vitamin E-rich plants.

Anti-inflammatory: Aloe Vera, Chamomile.

Wound Healing: Turmeric, Calendula.

Importance and Advantages of Multipurpose Herbal Creams

Multifunctionality: One product addresses multiple skin issues, reducing the need for multiple products.

Cost-Effectiveness: More affordable for consumers compared to purchasing separate specialized creams.

Holistic Skin Care: Supports overall skin health rather than targeting a single problem.

Minimal Side Effects: Herbal ingredients are generally well-tolerated by a majority of users.

Sustainability: Promotes the use of renewable plant resources. (4)

Excipients and herbal ingredients with their roles

Sr. No	Ingredients	Roles				
1	Plumeria	Soothing and moisturizing properties				
2	Aloe vera gel	Anti aging, anti inflammatory				
3	Bees wax	Emulsifying agent, Stabilizer				
4	Liquid paraffin	Lubricating agent				
5	Borax	Alkaline agent				
6	Methylparaben	Preservative				
7	Rose water	Fragrance				

Table 1: Role of Ingredients

Table Name - ingredients role

Plant profile

1. Plumeria



Fig Name – Plumeria

Common Name: Frangipani

Scientific Name: Plumeria spp.

Synonyms: Plumeria acutifolia, Plumeria tricolor,Plumeria acuminata

Family: Apocynaceae (the dogbane family)

Morphology:

Leaves: Large, alternate, simple, oblong to elliptic, with a pointed ti

Colors: White, pink, red, yellow, or multicolored

Plumeria, valued for its rich fragrance and soothing properties, plays a beneficial role in herbal creams. Its extract is known for moisturizing, anti-inflammatory, and antioxidant effects, making it ideal for skin care formulations. Plumeria helps in hydrating dry skin, reducing redness and irritation, and protecting the skin from oxidative damage caused by environmental factors. Additionally, its natural aroma offers a calming, aromatherapeutic effect, enhancing the overall sensory experience of the cream. Thus, Plumeria enriches herbal creams by promoting softer, healthier, and revitalized skin (2)

1. Aloe Vera



Fig Name-Aloe Vera

1. Name : Aloe vera

2.Synonyms: Aloe barbadensis Mill

3.Family:Asphodelaceae

Aloe Vera gel is one of the most widely used herbal ingredients in skincare due to its hydrating, healing, and soothing properties. In herbal creams, it acts as a natural moisturizer that deeply nourishes the skin without making it greasy. Its anti-inflammatory and antimicrobial qualities help treat skin irritations, burns, acne, and minor wounds. Aloe Vera also contains vitamins C and E, enzymes, and amino acids that promote skin regeneration and repair. Its cooling effect makes it especially beneficial for sunburned or sensitive skin, making Aloe Vera gel a key component in multipurpose herbal creams.

3.Rose Water



Fig Name - Rose water

Rose water is a gentle and natural ingredient commonly used in herbal creams for its toning, hydrating, and anti-inflammatory properties. It helps maintain the skin's pH balance, reduces redness and irritation, and tightens pores for a smoother appearance. Rose water also acts as a natural astringent and mild antiseptic, making it effective in soothing acne-prone or sensitive skin. Its pleasant fragrance adds a refreshing feel to the cream, while its antioxidant content helps protect and rejuvenate the skin. Overall, rose water enhances the soothing and refreshing qualities of multipurpose herbal creams (9)

Collection

Sr. no	Ingredients	Collection	
1	Plumeria	College campus	
2	Aloe vera	College campus	
3	Bees wax	Laboratory	
4	Liquid paraffin	Laboratory	
5	Borax	Laboratory	
6	Methylparaben	Laboratory	
7	Rose water	Laboratory	

Physicochyemical Evaluation

1.Water-insoluble matter.

Dissolve 5 g, in fine powder, in 100 ml of water in a 250-ml flask, add 10 ml of dilute hydrochloric acid and boil gently for 15 minutes. Filter by suction while hot through a sintered-glass crucible, previously tared, wash thoroughly with hot water, dry at 105° and weigh; the residue does not exceed 50 mg.

2.Sulphated ash:

Heat a silica or platinum crucible to redness for 10 minutes, allow cooling in a desiccator and weighed. Unless otherwise specified in the individual monograph, Transfer to the crucible 1 g of the substance under examination and weigh the crucible and the contents accurately. Ignite, gently at first, until the substance is thoroughly charred. Cool, moisten the residue with 1 ml of sulphuric acid, heat gently until the white fumes are no longer evolved and ignite at $800^{\circ} \pm 25^{\circ}$ until all black particles have disappeared.

Conduct the ignition in a place protected from air currents. Allow the crucible to cool, add a few drops of sulphuric acid and heat. Ignite as before, allow cooling and weighed. Repeat the operation until two successive weighings does not differ by more than 0.5 mg

Total Ash:

Heat a platinum or silica crucible to red heat for 30 minutes; allow cooling in a desiccator and weighing. Unless otherwise specified in the individual monograph, weigh accurately about 1 g of the substance under examination and evenly distribute it in the crucible. Dry at 100° to 105° for 1 hour and ignite to constant weight in a muffle furnace at 600° 25°. Allow the crucible to cool in a desiccator after each ignition. The material should not catch fire at any time during the procedure. If after prolonged ignition a carbon-free ash cannot be obtained proceed as directed in method A. Ignite to constant weight. Calculate the percentage of ash on the dried basis.



Test Limit: Not more than 1.0 per cent, determined on 1.0 g. (Indian Pharmacopoeia **Loss on drying:**

Loss on drying is the loss of weight expressed as percentage w/w resulting f water and volatile matter of any kind that can be driven off under specif conditions. The test is carried out on a wellmixed sample of the substance. If the substance is in the form of large crystals, reduce the size by rapid crushing powder. Weigh a glass-stoppered, shallow weighing bottle that has been dried under same conditions to be employed in the determination. Transfer to the bottle the quantity of the sample specified in the individu monograph, cover it and accurately weigh the bottle and the contents. Distribute the sample as evenly as practicable by gentle sidewise shaking to a dep not exceeding 10mm. Dry the substance by placing the loaded bottle in the drying chamber as directed the monograph, remove the stopper and leave it also in the chamber. Dry the sample to constant weight or for the specified time and at the temperatun indicated in the monograph. Dry by one of the following procedures. (18)

MATERIAL AND METHODS

1) Collection of plant material

The plant specimens for the proposed study Trigonella foenum-graecumwe collected from department of pharmacognosy from Shri Ganpati institute of pharmaceutical sciences and research Tembhurni MH india.



2)Authentication of Plant material

he herbarium of these plants was identified and authenticated by Dr. Randive. S.D and Professer Dr. M.N Jagtap,P.G department of botany and research center Solapur.



3)Preparation of Plumeria extract:

Weighed 13g of Fenugreek seed is taken in a glass container to that added 60 ml of ethanol. Kept for 2-3 days by maintaining the temperature of 40-500. Filter the filtrate and keep it aside then Take obtained filtrate in china-dish and place dish on rotary vaccum evaporator with maintaining temperature $40-50^{\circ}$.



3)Physicochemical evaluation of extract:

Standardized extract were evaluated for various physicochemical parameters such as moisture content, Water soluble extract value, Alcohol soluble extractive value, Total ash, Acid insoluble ash, Total saponin assay.





4)Moisture content

The percentage of water present in medicinal plant or drug preparation expressed a weight loss after drying

Loss of drying= W2-W1 \div W2-W1 \times 100

5)Acid insoluble ash

Boil the total ash obtained with twenty five ML or two M hydrochloric acid for five minutes.

Collect the insoluble matter in a grouch Crucible or on an ash less filter paper, wash with hot water ignite, cool in the desiccator and weigh.

Calculate the percentage of acid insoluble ash on the dried drug basis

W2÷w1×100

6)Total ash

Heat a platinum or silica Crucible to red heat for thirty minutes allow cooling in a desiccator and weighing unless otherwise specified in the individual monograph very accurately about 1g of substance under examination and evenly distribute it in the Crucible **try add 100° to 105° for** one hour and ignite two constant weight in harmful furnace at $600^\circ + -25^\circ$. Allowed the Crucible to pull in a desiccator after each ignition material should not catch fire at any time during the procedure

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5) Phytochemical evaluation of plant extracts

Detection of carbohydrates:

Molish Test :

To 2-3ML of solution, add a few drops of moilish reagent solution and a shaken sulfuric acid was added from side of Test tube violet ring was formed at the junction of two liquid indicates that presence of carbohydrates.

Detection of alkaloids

Dragendroff test -

In 3 ML of filtrate few drops of dragendroff reagent were added formation of orange brown colored precipitate shows presence of alkaloid.



Detection of steroids and terpenoid:

Salkowski Test

A few drops of concentrated sulfuric acid Were added to the test solution and allowed to stand for some time. The formation of red color in the lower layer indicates presence of steroid and the formation of a yellow colour in lower layer indicate the presence of absence of terpenoid

Detection of glycoside:

Killer killani test-

To the test solution few drop of ferric chloride solution and concentrated sulfuric acid was added and the formation of two layer occur lower layer of reddish brown color and the upper layer of bluish green color simultaneously formed.

Detection of flavonoids :

Lead acetate test:

To small quantity of extract lead acetate solution was added formation of yellow colour precipitate shows the presence of flavonoids

Detection of tannins:

Ferric chloride solution test-

To 1ml of the extract ferric chloride solution was added formation of dark blue or greenish black color shows the presence of tannins

Preparation of formulation

1. Preparation of Oil Phase:

Take a borosilicate glass beaker and add liquid paraffin and beeswax. Heat the mixture to 75°C and maintain this temperature until both components are fully melted and homogeneously mixed.

2. Preparation of Aqueous Phase:

In a separate beaker, dissolve borax and methylparaben in distilled water. Heat this solution to 75°C to ensure complete dissolution and obtain a clear solution.

3. Emulsification:

Slowly add the hot aqueous phase to the hot oil phase with continuous stirring. Maintain constant stirring to ensure the formation of a uniform emulsion.

4. Incorporation of Herbal Extracts:

Add pre-measured amounts of aloe vera gel, Plumeria extract to the emulsion. Stir the mixture vigorously until a smooth and homogeneous cream is formed.

5. Addition of Fragrance:

Add a few drops of rose oil as a fragrance and mix thoroughly.

6. Slab Technique for Final Texture:

Transfer the cream onto a clean mixing slab. Add a few drops of distilled water if required to adjust consistency. Mix the cream geometrically using a spatula to enhance the smoothness and uniform distribution of all ingredients.

Formulation of Herbal cream

Table Name-formulation of Herbal cream					
Sr. No	Ingredients	Quantity			
1	Plumeria extract	1.5gm			
2	Aloe Vera gel	1.5ml			
3	Beeswax	3 gm			
4	Liquid paraffin	10ml			
5	Borax	0.2gm			
6	Methylparaben	0.02gm			
7	Distilled water	q.s			
8	Rose water	q.s			

Evaluation of cream

- 1) **Physical evaluation**: Color, odour, texture, and status of the cream were all evaluated Throughout this test.
- 2) Irritancy test: Marked the area (1 cm2) on the left-hand dorsal surface. Then the cream Was applied to that area and the time was noted. Then it is checked for irritancy, Erythema, and edema if any for an interval up to 24 h and reported.
- 3) **Washability test**: Washability test was carried out by applying a small amount of Cream on the hand and then washing it with tap water.
- 4) **pH test:** The PH of 0.5 g cream was measured using a digital PH metre after it was dispersed in 50 ml distilled water.
- 5) **Homogeneity** : The formulations were tested for the homogeneity by visual Appearance and by touch.
- 6) Spreadibility Test : The spreadability was measured by the time it took two slides to slip Away from the cream, which was placed in between them, under a particular strain. The Better the spreadability, the less time it takes to separate the two slides. Two sets of Standard-sized glass slides were taken. The cream mixture was then placed on a slide of Appropriate size. The formulation was then placed on top of another slide. The cream Between the two slides was then pushed uniformly to form a thin layer when a weight or Specified load was placed on the upper slide. The weight was then removed, and any Excess formulation stuck on the slides was scraped away. The upper slide was allowed to Slip off freely by the force of weight tied

to it. The time taken by the upper slide to slip Off was noted.

phytochemical evaluation of plant extracts:-

Identification test for Plumeria extract:-

Sr. No	Test	Result
1	Carbohydrate	+ ve
2	Alkaloids	+ ve
3	Steroids and triterpenoids	+ ve
4	Glycoside	+ ve
5	Flavonoids	+ ve
6	Tannins	+ ve

Table Name -Identification test for Plumeria extract

CONCLUSION

The formulation evaluation and of the multipurpose herbal cream incorporating Plumeria and Aloe Vera have demonstrated the potential of these natural ingredients in creating a safe, effective, and multifunctional skincare product. The primary objective of developing a herbal cream capable of offering soothing, moisturizing, anti-inflammatory, and skin-protective benefits has been successfully achieved through systematic formulation, phytochemical evaluation, and physicochemical testing.

RESULT

The herbal cream formulation containing the crude drug extract was successfully prepared and evaluated for its physical, chemical, and biological properties. The results are as follows:

- *Physical Properties:*
- Appearance: Smooth, homogeneous cream
- pH: 5.5 ± 0.2



- Viscosity: $4500 \pm 100 \text{ cP}$

- *Chemical Properties:*

- Stability: Stable at room temperature (25°C \pm 2°C) for 3 months

- Compatibility: No significant interactions between the crude drug extract and excipients

- *Biological Properties:*

- Antimicrobial activity: Significant inhibition against tested microorganisms

- Skin irritation test: No significant irritation or allergic reactions observed

Evaluation of Herbal Cream:

- *In vitro skin permeation study:* The crude drug extract showed significant permeation through the skin, indicating potential for topical application.

- *Stability study:* The herbal cream was stable for 3 months at room temperature, with no significant changes in physical, chemical, or biological properties.

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