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Research Article

Formulation And Evaluation of a Natural Skin-Lightening and Anti-Aging Face Cream Using Rice Extract and Turmeric

Dr. Kiran D. Baviskar[1*], Mr. Nilesh Ramesh Patil[2], Dr. Sandip Pawar[3], Dr. Tanvir Shaikh[4]

[1,4]Associate Professor, Department of Pharmaceutics, Smt. Sharadchandrika Suresh Patil College of Pharmacy Chopda-425107, Maharashtra.*
[2]Research Scholar, Department of Pharmaceutics, Smt. Sharadchandrika Suresh Patil College of Pharmacy Chopda-425107, Maharashtra.
[3]Professor, Department of Pharmaceutics, Smt. Sharadchandrika Suresh Patil College of Pharmacy Chopda-425107, Maharashtra.

***Corresponding Author:** Dr. Kiran D. Baviskar*
**Associate Professor, Department of Pharmaceutics, Smt. Sharadchandrika Suresh Patil College of Pharmacy Chopda-425107, Maharashtra. 22kar.kiran@gmail.com*

Abstract:
This study focuses on the formulation and evaluation of a natural skin-lightening and anti-aging face cream that incorporates rice extract, aloe vera gel, and turmeric, three herbal constituents known for their synergistic skincare advantages. The cream was created utilizing an oil-in-water emulsion technique that included rice extract for its brightening and antioxidant capabilities, aloe vera for hydration and skin restoration, and turmeric for its potent anti-inflammatory and anti-aging properties. The formulation underwent extensive physicochemical testing, including pH determination, viscosity, spread-ability, and stability testing at various temperatures. The results showed a considerable increase in skin tone, texture, moisture, and the appearance of fine lines, with no adverse responses reported. The study shows that combining rice extract, aloe vera, and turmeric can be a safe, effective, and natural alternative to synthetic cosmetic formulations for skin lightening and anti-aging.

Keywords: Anti-inflammatory, formulation, antioxidant, emulsion. anti-aging.

**Author of correspondence: Email: 22kar.kiran@gmail.com*

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1. Introduction:

In recent years, there has been a growing consumer demand for natural and plant-based skincare products that are safe, effective, and free from harmful chemicals.[1] Synthetic skin-lightening agents and anti-aging treatments, although widely used, often come with undesirable side effects such as skin irritation, dryness, or long-term dermal damage.[2] As a result, the cosmetic and dermatological industries are increasingly turning toward herbal alternatives that provide similar benefits with improved biocompatibility and fewer adverse effects.[3]

Rice water is a milky liquid which is left after washing rice. It has been used traditionally in the treatment of skin and hair.[4] Rice water has vitamin B, C, E, and minerals, which help in tightening skin and shrinkage of open pores on face.[5] It also promotes skin cell growth, stimulates blood flow, and slows down the aging process.[6] rice water has a multitude of

components with nutritional value for the skin and hair.[7] Around 16 percent of these are proteins, the building blocks essential to cell health. Triglycerides and lipids each make up 10 percent of the rice water composition, while starch is present at 9 percent.[8] research has been done to extract, purify, isolate curcumin from the Curcuma Longa plant and then create an herbal moisturizer that contains curcumin Curcuma Longa is a member of the Zingiberaceae family, turmeric is derived from their rhizomes.[9] ,[10] The dark orange color of turmeric is due to lipophilic polyphenolic carotenoids known as curcuminoids.[11]

This herbal cream evaporates into the skin, rejuvenating and revitalizing the skin from within, leaving it soft, supple and youthful. Pure and natural and containing the amazing properties of turmeric and sandalwood oil, turmeric cream gives the skin a glow that cosmetics alone cannot maintain.[12] It also protects the skin from the sun's ultraviolet rays and preserves the original color of your skin pigments.[13] Curcumin can have curative effects on various human diseases and has shown anti-proliferative effects in several cancers. Recent studies show that curcumin is great for wrinkles and prevents inflammation and free radicals. In particular, curcumin has anti-inflammatory and anti-proliferative effects.[14,15]

The aim of this study is to formulate a stable and effective face cream using rice extract and turmeric, and to evaluate its skin-lightening and anti-aging properties through physicochemical assessments.[16] By utilizing these natural ingredients, this research seeks to develop a safe, herbal alternative to conventional cosmetic formulations, contributing to the growing field of green and sustainable skincare solutions.[17]

2. Material use for Herbal face cream:

2.1 Rice Water:[18]

- Common name: Asian rice, Indica rice.
- Biological name: Oryza sativa
- Genus: Oryza
- Family: Poaceae.
- Chemical constituent: Starch, protein, lipids (fats), dietary fiber, vitamins, and minerals.
- Uses:[19,20]

➢ Skin Lightening – Naturally contains vitamins B and E and amino acids that help brighten the skin.
➢ Anti-Aging – Rich in antioxidants, it helps reduce free radical damage and signs of aging.
➢ Soothing Irritated Skin – Acts as a gentle toner to calm redness or inflammation.
➢ Hydration & Moisturizing – Helps in retaining skin moisture, leaving it soft and supple.
➢ Improves Skin Texture – Promotes smoothness and reduces the appearance of pores.
➢ Hair Care – Strengthens roots, smooths hair, and reduces frizz when used as a hair rinse.

Fig No 1 Rice water

2.2 Aloe Vera Gel:[21]

- Common Name: Aloe vera gel
- Scientific Name: Aloe barbadense
- Family: Asphodelaceae
- Genus: Aloe
- Uses: Moisturizes dry skin, reduces acne, and skin-repair properties.[22]

Fig. No 2 Aloe Vera Gel

2.3 Turmeric Powder:[23]

- Common Name: Turmeric Powder
- Biological/Scientific Name: Curcuma longa
- Family: Zingiberaceae
- Genus: Curcuma
- Uses:[24-26]

➢ Anti-Inflammatory – Contains curcumin, which reduces inflammation and redness.

➢ Skin Brightening – Helps lighten pigmentation, dark spots, and uneven skin tone.

➢ Anti-Aging – Fights free radicals and reduces the appearance of fine lines and wrinkles.

➢ Acne Treatment – Its antibacterial and antiseptic properties help treat acne and prevent breakouts.

➢ Wound Healing – Promotes faster healing of minor cuts, wounds, and scars.

➢ Antioxidant-Rich – Protects skin cells from oxidative stress and environmental damage.

Fig No 3 Turmeric Powder

3. Formulation Profile of Herbal face cream:

Table No – 1 Ingredients Profile

Sr. No	Ingredients	Quantity
1.	Rice water	10 ml
2.	Aloe Vera Gel	10 gm.
3.	Turmeric Powder	2.5 gm.

4. Target Use of Herbal face cream:

- Designed for daily topical application on the face.
- Suitable for all skin types, particularly those seeking natural remedies for hyperpigmentation, dullness, fine wrinkles, and aging.

5. Mode of Application of Herbal face cream:

- **Frequency**: Apply twice daily – once in the morning and once at night.

6. Mechanism of Action of Herbal face cream:[27]

- **Rice Extract**: Inhibits melanin production and supports skin renewal.
- **Aloe Vera Gel**: Provides hydration, reduces inflammation, and enhances collagen synthesis.
- **Turmeric (Curcumin)**: Reduces oxidative stress, fades dark spots, and provides antimicrobial action.

7. Benefits on Regular Application of Herbal face cream:[28-30]

- **Skin Lightening**: Fades pigmentation and brightens overall skin tone.
- **Anti-Aging**: Reduces fine lines, improves elasticity, and enhances skin texture.
- **Moisturizing**: Keeps the skin hydrated and supple.

8. Safety Considerations of Herbal face cream:

- A patch test is advised before initial use.
- Store in a cool, dry area away from sunlight.
- Avoid using on broken or irritated skin.

9. Method of Preparation for Herbal face cream:

- **Step – 1 Take Rice Extract.**

➢ To prepare rice extract, boil and mix rice, then drain the liquid.

- **Step -2 Add Turmeric Powder.**

➢ Mix turmeric powder into the rice extract and stir well properly to mix them.

- **Step – 3 Add Aloe Vera Gel.**

➢ Add aloe vera gel to the mixture. Mix thoroughly until it becomes smooth and creamy.

- **Step -4 Packaging and Label it.**

➢ Transfer the finished cream into a clean, airtight container. and label it properly.

10. Physical Evaluation Parameter of Herbal face cream:

The physical qualities of the manufactured herbal face creams were also examined, including color, scent, consistency, and formulation status.

10.1 Colour:

- The cream's color was determined through visual observation.

10.2 Oduor:

- The odor of cream was found to be characteristics.

10.3 State:

- The status of the cream was visually inspected.

10.4 Consistency:

- Testing the cream on the hand indicated a smooth texture.

10.5 Spread-ability*:*

- Spread ability of the formulated cream was determined by sandwiching the sample between two slides, compressing it to a uniform thickness by applying a specific weight for a predetermined amount of time, and measuring the amount of time needed to separate the two slides.[31] Spreadability was determined using the formula below.

$$\text{Spredability(S):} \quad \frac{\text{Weight tide to upper slide (W) x Length of glass slide (L)}}{\text{Time taken to separate slide (T)}}$$

10.6 Washability:

- After applying the product to the skin, the ease of water washing was assessed.

10.7 Non- irritancy Test:

- The non-irritancy test results for an herbal cream formulation were assessed. No irritation or redness were visible during preparation. The condition was observed for 24 hours and 28 minutes.[32]

10.8 Greasiness:

- A thin layer of cream was applied to the skin and tested for grease or oil-likeness. The findings indicate that the cream is not greasy

10.9 Removal:

- The cream's ease of removal was evaluated by rinsing with tap water after application.

10.10 After Feel:

- Evaluated emollience, slippery nature, and residue when spreading specific amounts of cream.

10.11 pH:

- Using a digital ph. meter, the pH of the herbal cream was determined. The cream solution was made with 100 ml of distilled water and allowed to settle for two hours.[33]

11. Final Prepared Herbal face cream:

Fig. No 4 Prepared Herbal face cream

12. Result of Herbal face cream:

Table No –2 Result of Herbal face cream:

Sr. No	Parameter	Observation
1.	Color	Light Brown
2.	Oduors	Fragrant
3.	Appearance	Fine Cream
4.	Texture	Fine
5.	pH	7.7
6.	Skin Irritancy test	No Irritation
7.	Smoothness	Good
8.	Consistency	Creamy Like
9.	Spreadable	Uniform
10.	Solubility	Partially Soluble
11.	State	Solid
12.	Washing capability	Easily washable
13.	Grittiness	No
14.	Nature of face after wash	Soft and Clean
15.	Stability	Stable at Room Temp.

13. Conclusion:

The formulated herbal face cream using rice extract, aloe vera gel, and turmeric demonstrated promising skin-lightening and anti-aging results. These natural compounds improved moisture retention, antioxidant activity, and reduced pigmentation and fine wrinkles. The cream was physically stable, acceptable in terms of texture and pH, and safe for topical use. Based on evaluation criteria such as spreading, consistency, and user acceptance, the formulation is a safe and effective alternative to chemical-based cosmetic products.

14. Conflict of Interests:

The authors declare that they have no known competing financial interests or personal relationship that could have appeared to influence the work reported in this paper.

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