

A Research on Formulation and Evaluation of Herbal Anti-Aging Cream

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ABSTRACT:

The present study involves the formulation and evaluation of herbal anti-aging cream using natural ingredients known for their therapeutic and cosmetic properties. This research focuses on the formulation and evaluation of herbal anti-aging cream using a blend of medicinal plant extracts and natural ingredients known for their skin-enhancing and therapeutic properties. The cream was formulated using Ashwagandha (*Withania somnifera*), Neem (*Azadirachta indica*), which are well-documented for their antioxidant, antimicrobial, anti-inflammatory, and rejuvenating effects on the skin. While Vitamin E oil and were used as emollients and antioxidants. Beeswax and borax served as the cream base and emulsifier, respectively, with methyl paraben used as a preservative. Rose water and distilled water acted as the aqueous medium.

The cream was prepared using the fusion method and subjected to a series of evaluation parameters including pH, spreadability, washability, stability, and skin irritation potential. The formulation exhibited good spreadability with a pH compatible with human skin (5.5–6.5). It was stable under different storage conditions and showed no signs of phase separation or microbial contamination over the observation period. Confirming the safety and dermatological acceptability of the product.

I. INTRODUCTION:

In recent years, there has been a significant shift in consumer preferences from synthetic skincare products to natural and herbal formulations due to the increased awareness of the adverse effects of chemical-based cosmetics. Herbal cosmetics are gaining popularity as they are considered safer, more biocompatible, and environmentally friendly. Among various skincare products, face creams are widely used to maintain skin health, provide moisturization, and treat common dermatological issues such as acne,

dryness, and premature aging. Herbal face creams are formulations that incorporate plant-based extracts and essential oils possessing therapeutic properties such as antioxidant, antimicrobial, anti-inflammatory, and moisturizing effects. Medicinal plants like *Withania somnifera* (Ashwagandha), *Azadirachta indica* (Neem), have been extensively used in traditional medicine for skin-related disorders. These herbs are rich in bioactive compounds that help rejuvenate the skin, prevent infections, and delay the signs of aging.

- Ashwagandha (*Withania somnifera*): Known for its adaptogenic and antioxidant properties, it helps reduce oxidative stress, improves skin elasticity, and slows down aging.
- Neem (*Azadirachta indica*): A powerful antibacterial and antifungal agent, it helps manage acne, reduces inflammation, and purifies the skin.

Essential oils and natural excipients also contribute significantly to the cream's efficacy:

- Vitamin E Oil acts as a skin-conditioning agent and antioxidant.
- Beeswax and Borax serve as the base and emulsifying agents, respectively, helping in the formation of a stable and homogenous cream.

In the formulation of herbal face creams, the use of safe preservatives like methyl paraben and natural solvents like rose water ensures product stability without compromising skin safety. The choice of ingredients is based not only on traditional uses but also on scientific literature supporting their pharmacological activities.

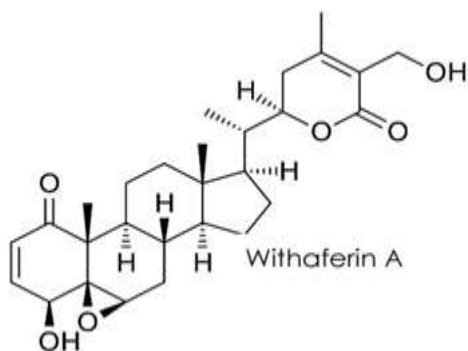
The objective of this study is to formulate a stable and effective herbal face cream using selected herbs and natural ingredients and to evaluate its physical properties, stability, and skin compatibility. This formulation aims to deliver a gentle yet potent skincare solution suitable for daily use, offering both cosmetic and therapeutic benefits

without the risks associated with chemical-laden products.

- 1) Ashwagandha (*Withania somnifera*)
 - Family: Solanaceae
 - Common Name: Indian Ginseng, Winter Cherry
 - Parts Used: Root, Leaves
 - Key Constituents: Withanolides, alkaloids, saponins
 - Properties: Antioxidant, anti-aging, anti-inflammatory, adaptogenic
 - Uses in Skincare: Promotes collagen production, reduces wrinkles, soothes stressed skin



Fig : Ashwagandha



Structure of ashwagandha

- 2) Neem (*Azadirachta indica*)
 - Family: Meliaceae
 - Common Name: Neem, Indian lilac
 - Parts Used: Leaves, Bark, Oil ki
 - Key Constituents: Nimbin, nimbidin, azadirachtin
 - Properties: Antibacterial, antifungal, anti-inflammatory, antipruritic
 - Uses in Skincare: Treats acne, reduces skin infections, clears blemishes



Fig: Neem leaves

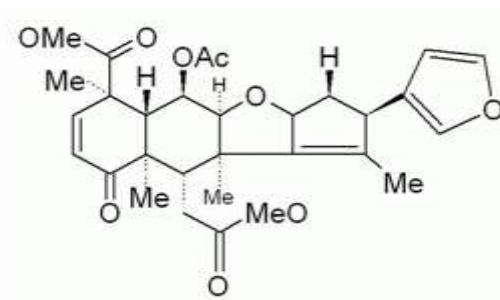


Fig: Structure of neem

II. INGREDIENTS AND ROLE:

- 1) Ashwagandha: Anti-aging, antioxidant; rejuvenates skin and boosts collagen



Fig: ashwagandha powder

- 2) Neem: Antibacterial, antifungal; treats acne and skin infections.



Fig: Neem leaves powder

- 3) Beeswax: Emollient, thickener; forms a protective layer and retains moisture.



Fig : bees wax

- 4) Borax: Emulsifier; helps mix oil and water phases.



Fig: borax

- 5) Methyl Paraben: Preservative; prevents microbial growth in the cream.



Fig: methyl paraben

- 6) Liquid Paraffin: Moisturizer; softens and smooths skin.
7) Vitamin E Oil: Antioxidant; protects skin from free radicals and nourishes.



Fig: Vitamin E

- 8) Rose Water: Skin toner; adds fragrance and soothes irritation



Fig: Rose water

- 9) Distilled Water: Solvent; forms the aqueous base of the cream.



Fig: Distilled water

MATERIAL AND METHODS:

Materials:

- Ashwagandha
- Neem
- Bess wax
- Borax
- Methyl paraben
- Liquid paraffin
- Vitamin-E oil
- Rose water
- Dist. Water

Methods:

- 1) Extraction method of Ashwagandha
1. Collection and Drying

- Collect fresh roots of Ashwagandha.
- Wash thoroughly to remove dirt.
- Dry them in the shade or in a hot air oven at 40–50°C until completely dry.
- 2. Grinding
 - Grind the dried roots into a coarse powder using a mechanical grinder.
- 3. Extraction Methods
 - Aqueous Extraction: Soak 100g of powdered root in 1000 mL of distilled water. Heat gently (60–70°C) for 3–4 hours with continuous stirring. Cool and filter through muslin cloth or Whatman filter paper. Evaporate the filtrate to get a concentrated extract.
 - Ethanol or Hydroalcoholic Extraction (More potent)Macerate 100g of powder in 70% ethanol (1:10 ratio) for 72 hours at room temperature.Stir occasionally.Filter and concentrate the extract under reduced pressure using a rotary evaporator.
 - Storage: Store the extract in an airtight container in a cool, dark place or refrigerate.



Fig: extraction of ashwagandha

- 2) Extraction Process of Neem :

1. Harvesting: Neem (*Azadirachta indica*) is a tree native to the Indian subcontinent and is widely cultivated for its medicinal And agricultural uses. Harvesting neem involves collecting its leaves, seeds, and other plant parts for use in various Applications.
2. Washing: Washing neem leaves is an essential step in preparing them for use in various applications, including medicinal, Agricultural, and cosmetic uses. The washing process helps remove dirt, debris, and other impurities from the leaves.
3. Drying: Drying neem leaves is an essential step in preserving their quality and potency.

Drying helps remove excess Moisture from the leaves, preventing spoilage and extending their shelf life.

4. **Crushing:** Crushing neem leaves is a process used to release their bioactive compounds, such as azadirachtin, which is a Natural insecticide. Crushing can be done using various methods, including manual and mechanical techniques.
5. **Sieving:** is a process used to separate crushed neem powder into different particle sizes. This is an important step in Ensuring the quality and consistency of the final product
6. **Boiling:** Boiling neem powder is a process used to extract its bioactive compounds, such as azadirachtin, which is a natural Insecticide. Boiling can be done using various methods, including hot water extraction



Fig: neem extract

❖ **Method of Preparation:**

- 1) **Preparation of Oil Phase:** Beeswax, olive oil, liquid paraffin, and Vitamin E oil were weighed and melted together using a water bath.
- 2) **Preparation of Aqueous Phase:** In a separate container, borax was dissolved in distilled water. To this, rose water, methyl paraben, and herbal extracts (Ashwagandha, Neem, Tulsi, and Ginkgo biloba) were added and mixed thoroughly. The aqueous phase was also heated to 70–75°C to match the oil phase temperature.
- 3) **Emulsification Process:** The hot aqueous phase was slowly added to the oil phase with continuous stirring using a mechanical stirrer until a uniform emulsion was formed.
- 4) **Cooling and Addition of Essential Oil:** After emulsification, the mixture was allowed to cool gradually to room temperature, during

which was added with gentle stirring to preserve its volatile components.

- 5) **Packaging:** The prepared herbal anti-aging cream was then transferred into clean, airtight containers and stored at room temperature for further evaluation.



Fig: Formulation of Cream

❖ **Formulation Table:**

Ingredients	Quantity
Ashwagandha extract	10ml
Neem extract	7ml
Borax	7gm
Methyl paraben	10gm
Liquid paraffin	5ml
Bees wax	7gm
Vit E oil	1ml
Rose water	1ml
Dist water	Qs

❖ **Evaluation test :**

- 1) **Physical Evaluation**
Purpose: To visually assess the appearance and general physical properties of the cream.

Parameters observed:

- Colour
- Odour
- Texture
- Consistency
- Phase separation

Significance: Ensures uniformity, aesthetic appeal, and that the formulation is free from lumps or separation.

2) pH

Purpose: To determine the pH of the cream to ensure it is skin-friendly and does not cause irritation.

Method:

- Weigh 1 g of cream.
- Dissolve in 100 mL of distilled water.
- Measure the pH using a digital pH meter.
- Ideal range: 4.5 – 6.5 (close to natural skin pH).

Significance: Prevents skin irritation and supports skin barrier function.



Fig : pH test

3) Spreadability Test

Purpose: To assess how easily the cream spreads on the skin, indicating ease of application.

Method:

- Place a fixed amount of cream between two glass slides.
- Apply a known weight and measure the time taken for the upper slide to move a certain distance.
- Formula:

Significance: A cream with good spreadability is more acceptable to users.

$$\text{Spreadability} = \frac{M \times L}{T}$$

4) Washability Test

Purpose: To evaluate how easily the cream can be washed off with water.

Method:

- Apply a small amount of cream to the skin.
- Allow to set for 10–15 minutes.
- Wash with tap water and observe ease of removal.

Significance: Indicates non-greasiness and user convenience.



Fig : Washability test

5) After Fill Test

Purpose: To observe any changes in the cream's characteristics after being filled into containers.

Method:

- Inspect filled containers after 24–48 hours.
- Check for leakage, phase separation, consistency change, or container interaction.

Significance: Ensures packaging integrity and product stability post-filling.

6) Irritancy Test

Purpose: To check for any allergic or irritant reaction when applied to the skin.

Method:

- Apply a small quantity on a patch of skin (usually forearm or behind the ear).
- Leave for 24 hours and observe for redness, swelling, itching, or rash.

Significance: Confirms the safety of the cream for human use.



Fig : Irritancy test

7) Greasiness Test

Purpose: To assess the greasy or oily feeling left on the skin after application.

Method:

- Apply cream to the skin.
- After absorption, press blotting paper onto the area.
- Observe oil residue on the paper.

Significance: Helps evaluate user comfort and acceptability.

8) Stability Test

Purpose: To evaluate the long-term physical and chemical stability of the formulation.

Method:

- ❖ Store cream samples under different conditions:
- ❖ Room temperature
- ❖ Refrigerated
- ❖ Accelerated temperature ($40^{\circ}\text{C} \pm 2^{\circ}\text{C}$)
- ❖ Monitor for 1–3 months.
- ❖ Check for changes in colour, odour, pH, consistency, and phase separation.
- ❖ Significance: Determines shelf life and storage requirements.

III. RESULT:

Formulate and evaluated herbal anti-aging cream successfully. All the organoleptic properties were checked visually such as colour, odour, consistency, and texture. As a result, the colour observed was white colour, no bad smell occurred from formulation and the consistency of the formulation was found suitable as required to apply on the skin. Washability and cleansing properties of Ashwagandha was found to be good, and it is easily removed by washing with normal water. It

left a smooth feel on the skin after washing and no dryness was observed. No redness, no irritation or any dermatological effects were observed on skin during irritancy testing.



Fig . Anti-aging cream

IV. CONCLUSION:

In this study, herbal anti-aging cream was successfully formulated using a blend of natural ingredients such as Ashwagandha, Neem, combined with excipients like Beeswax, Borax, Methyl Paraben, and Liquid Paraffin. The cream was evaluated for its physical properties, stability, and skin compatibility. The formulation demonstrated a smooth texture, Ideal, and appropriate pH levels, making it suitable for daily skin application. Stability testing revealed that the cream maintained its consistency and showed no significant separation when stored at different temperatures. Additionally, microbial testing confirmed the effectiveness of the preservatives used in the formulation.

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