IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 3, December 2025
Impact Factor: 7.67

Herbal Creams: An Overview

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Abstract: *Creams are semi-solid topical formulations commonly used on the skin for cosmetic and therapeutic purposes. This review highlights the preparation and evaluation of herbal creams and discusses widely used medicinal plants incorporated in these formulations. Herbal creams are typically formulated as water-in-oil emulsions and include natural ingredients such as turmeric, papaya, aloe vera, tulsi, amla, cucumber and neem each selected based on its unique phytochemical and therapeutic value. The cream base often contains liquid paraffin, beeswax, borax and methyl paraben. These formulations undergo several evaluation parameters, including pH, viscosity, irritancy, spreadability, microbial stability, thermal stability, homogeneity, acid value, saponification value and diffusion studies. Rising concerns about the adverse effects of synthetic cosmetic products have increased the demand for herbal formulations, contributing significantly to the global cosmeceutical industry. Herbal creams, enriched with vitamins and minerals, nourish the skin and are considered safer alternatives to synthetic products, making them highly suitable for long-term use.*

Keywords: Herbal creams, cosmetics, semisolid dosage forms, turmeric, aloe vera

I. INTRODUCTION

The word cosmetics originates from the Greek term meaning “to adorn**, [1]**” and historically refers to substances applied to enhance appearance. These formulations, which date back to Ancient Rome, traditionally consisted of waxes and butters. **[2]** Modern cosmetics improve the appearance and health of skin while shielding it from environmental damage. They contain natural or synthetic components that maintain skin elasticity, texture, hydration and photoprotection.**[3]** Cosmetic formulations play an essential role in delaying visible signs of aging, reducing hyperpigmentation, improving roughness and combating free radicals. With increasing consumer awareness, preference has shifted toward herbal and plant-based beauty products due to their perceived safety and lower risk of side effects. Botanicals used in cosmetic formulations possess antimicrobial, emollient, antiseptic, anti-inflammatory and antioxidant properties. **[4,5]**

Figure 1 : Herbal Cosmetic Cream.

Both men and women use cosmetic creams daily as moisturizers, cleansers and skin-protective agents. Creams act as “skin food” for dry and cracked skin, offering lubrication and cleansing properties. **[6,13,19]** Historically, fats such as

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lanolin and vaseline formed the base of many moisturizing creams. Today, creams remain vital in enhancing appearance, improving skin condition, and promoting overall well-being.

CREAMS

Creams are semi-solid preparations applied to the skin, mucous membranes, eyes, rectum, vagina, or nasal cavity for cosmetic or therapeutic benefit. **[14,21]** They soften the skin, cleanse impurities and protect against dryness and environmental stressors. Common categories of cosmetic creams include cleansing, vanishing, massage, night, cold, hand and foundation creams. **[22]**

HERBAL CREAMS

Herbal creams are emulsions composed of both oil and aqueous phases and often incorporate herbal extracts such as neem, papaya, aloe veratulsi and turmeric. These formulations may also contain essential oils, tinctures, vitamins and minerals. Unlike synthetic creams that may contain harsh chemicals, herbal creams rely on naturally occurring bioactive compounds that are generally safer and more skin-friendly**.[3,8]**

Herbal medicines have gained global interest due to their safety, biocompatibility and minimal side-effects compared to synthetic formulations. Neem, commonly known as the "village pharmacy" is one of the most extensively studied medicinal plants in Ayurveda, Unani, and traditional folk medicine. Its leaves, seeds, bark, and oil possess a wide range of therapeutic benefits. Neem-based herbal creams are topical semisolid preparations designed for skin protection, moisturization, microbial control, and healing. **[18]** Growing cosmetic and pharmaceutical industries have sparked increasing research on neem-infused topical formulations for dermatological use.

Types of Herbal Cream

1. Oil-in-Water (O/W) Creams [14]

Oil droplets are uniformly dispersed in a continuous water phase. These are lighter, non-greasy creams ideal for day use.

2. Water-in-Oil (W/O) Creams [14]

Water droplets are dispersed within an oil medium. These thicker creams provide superior moisturization and are preferred for dry skin.

2. Botanical Description

Neem belongs to the family Meliaceae. It is an evergreen tree that grows 12-18 meters tall, with pinnate leaves and bitter-tasting leaflets. **[18,30]** The plant is native to India and widely distributed throughout Asia and Africa. The leaves contain various bioactive compounds responsible for medicinal properties.

3. Phytochemical Constituents

Neem contains more than 200 biologically active compounds, the most notable being:[18,30]

- Azadirachtin
- Nimbin
- Nimbidin
- Quercetin
- Flavonoids
- Triterpenoids
- Tannins
- Fatty acids (Oleic acid, Palmitic acid)

These phytochemicals contribute to neem's antimicrobial, anti-inflammatory, antioxidant, insecticidal and wound-healing actions.

4. Pharmacological Activities

Numerous studies support neem's therapeutic potential: **[8,18,21]**

- Antibacterial – Effective against Staphylococcus aureus, E. coli, Pseudomonas aeruginosa

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- Antifungal – Useful against Candida albicans and dermatophytic infections
- Anti-inflammatory – Reduces redness, swelling and irritation
- Antioxidant – Neutralizes free radicals and delays skin aging
- Wound healing – Promotes collagen synthesis and tissue regeneration
- Antiviral & antiprotozoal – Helps suppress vector-borne pathogens

5. Neem Herbal Cream Formulation

Neem herbal cream is typically formulated as oil-in-water (O/W) type emulsion suitable for easy skin absorption. **[1,7]**

Common ingredients include

Sr. No	Ingredient	Role in formulation
1	Neem leaf extract/neem oil	Active antimicrobial & healing agent
2	Stearic acid, Cetyl alcohol	Emulsifying & thickening agent
3	Glycerin	Humectant, improves moisture retention
4	Bees wax/vegetable wax	Provides consistency & stability
5	Preservatives (natural preferred)	Inhibit microbial growth
6	Perfume (optional)	Improves acceptability

Table 1: Composition and Functions of Ingredients in Neem Cream

Neem extract is incorporated in the oil/water phase during emulsification under controlled temperature with continuous stirring.

PREPARATION OF HERBAL CREAMS

Figure 2 : Traditional Grinding of Herbal Paste for Cream Formulation

Here is a clear and well-structured explanation of grinding and blending preparation technique for herbal creams along with solvents used for extraction. You can use it for assignments, review articles, or lab work.

Grinding and Blending Preparation of Herbal Cream

Herbal cream preparation involves converting plant materials into a fine, uniform paste or extract before incorporating them into the base (oil phase or aqueous phase). Grinding and blending help release active phytochemicals, improve texture, and enhance absorption.

1. Collection and Pre-Processing of Herbs [7]

Select fresh or dried herbal parts (leaves, bark, seeds, roots, flowers).
Wash thoroughly to remove dirt and contaminants.
Shade dry (if using dried sample) to prevent loss of volatile components.
Cut into small pieces for easier grinding.

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2. Grinding Process

Grinding converts solid herbal material into fine powder or paste.

Methods of Grinding

1. Mortar & Pestle (Traditional Method)

Used for small-scale preparation.

Gentle and maintains phytoconstituents.

2. Mechanical Grinder / Pulverizer

Used for bulk processing.

Produces uniform fine powder.

3. Wet Grinding

Herbs are ground with a small amount of water or suitable solvent

Helps release juice and active compounds.

Purpose of Grinding

Increase surface area of herb.

Enhance extraction of active components.

Improve dispersion in cream base.

Achieve smooth texture.

3. Blending Process:-

Blending mixes the ground herbal extract/paste with cream base to form uniform emulsion.

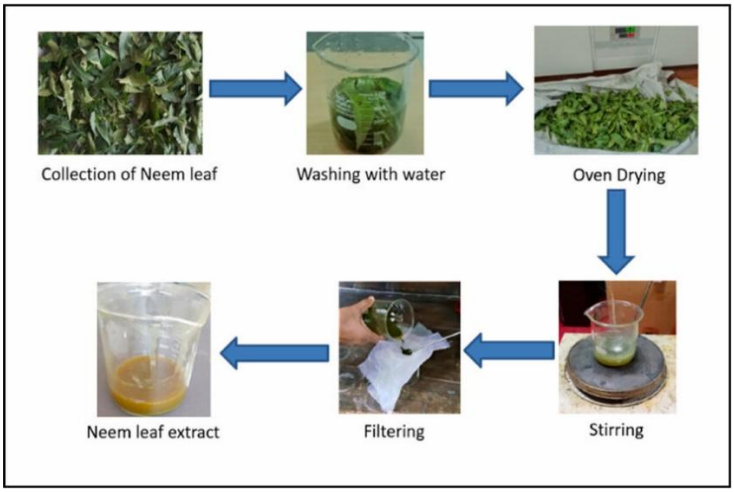

Figure 3 : Methodology for the Extraction of Neem (Azadirachta indica) Leaves

Steps in Blending

1. Prepare oil phase (e.g., stearic acid, wax, oils) and water phase separately.

2. Add herbal extract/powder into one of the phases:

Hydrophilic extracts → add to aqueous phase

Lipophilic extracts → add to oil phase

3. Use blender/mixer to homogenize.

4. Mix both phases at same temperature (~70–75°C). **[7,14]**

5. Continue blending until smooth cream is formed.

6. Cool gradually with continuous stirring.

Purpose of Blending

Uniform distribution of herbal constituents.

Stable and homogeneous cream formation.

Enhances absorption and therapeutic activity.

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Solvents Used in Preparation/Extraction of Herbal Material [8,15]

Sr. No	Type of Solvent	Example	Nature Purpose in Cream Preparation
1	Aqueous Solvents	Distilled water, Rose water	Polar Extract flavonoids, tannins, glycosides
2	Alcoholic Solvents	Ethanol, Methanol Semi-polar	Extract alkaloids, phenolics, terpenoids
3	Hydro-Alcoholic Solvent	Water + Ethanol mix Medium polarity	Widely used for herbal extraction
4	Oil Solvents	Coconut oil, Olive oil, Almond oil, Sesame oil	Non-polar Extract essential oils, fat-soluble compounds
5	Glycerin	Glycerol Humectant	Used for gel-based or moisturizing creams
6	Aloe juice/gel based solvents	Fresh aloe gel Natural medium	Enhances skin healing and hydration

Table 2 : Classification of Solvents Used in Herbal Extraction and Cream Preparation

Type of phytochemicals required.
Desired cream property (moisturizing, anti-acne, antiseptic).
Toxicity and skin compatibility.
Extraction efficiency.
Example: Simple Herbal Cream Preparatio
Grind neem leaves into fine paste with small amount.
The general process for manufacturing herbal creams includes the steps below:

1. Collection and Processing of Plant Material
Selected herbs are cleaned, dried and subjected to extraction or gel/juice collection through standardized procedures.

2. Preparation of Oil Phase
Beeswax and liquid paraffin are heated to around 75°C to create the oil phase.

3. Preparation of Aqueous Phase
Borax and methyl paraben are dissolved in distilled water and heated to 75°C to form a clear solution.

4. Emulsion Formation
The heated aqueous phase is gradually added to the oil phase with continuous stirring.

5. Addition of Herbal Extracts
Extracts, juices or gels are incorporated into the emulsion to obtain a uniform cream.

6. Fragrance Addition and Packaging
Compatible aromatic extracts are blended into the cooled cream before packing.

COMMON EXCIPIENTS AND THEIR ROLES
Beeswax: Acts as an emulsifying and thickening agent. **[14]**
Liquid paraffin: Provides lubrication and helps form the emulsion base. **[21]**
Borax: Functions as an alkalizing agent that reacts with wax to stabilize emulsions. **[22]**
Methyl paraben: Widely used preservative to prevent microbial growth. **[9]**
Fragrance oils: Improve aesthetic and sensory appeal. **[19]**

IDEAL CHARACTERISTICS OF A HERBAL CREAM
1. Efficient skin penetration to ensure therapeutic activity.
2. Non-toxic and non-irritating to avoid allergic reactions.
3. Smooth spreadability on application.
4. Ability to soften upon contact with body temperature.
5. Should not cause inflammation or redness.

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ADVANTAGES

- Simple and convenient to apply.
- Requires no specialized equipment or expertise to use.
- Ensures better patient compliance.
- Avoids large fluctuations in drug concentration.
- Easily washable and leaves minimal residue on the skin

LIMITATIONS

- Suitable only for drugs requiring low plasma concentration.
- May cause allergic responses or contact dermatitis in sensitive individuals.
- Ineffective for drugs with large particle size that cannot penetrate skin pores.

COMMON HERBS USED IN HERBAL CREAMS

Sr. No	Common Name	Part used	Chemical Constituents	Uses
1	Neem	Leaves of *Azadirachta indica*	Nimbidin, Nimbidal, Nimbin, Limonoids	Anti-oxidant, Antiseptic, Anti-ageing, Treats acne
2	Aloe vera	Leaves of *Aloe barbadensis*	Salicylic Acid, Aloesin, Aloeresin A, Aloeresin E, Isoaloeresin D	Anti-oxidant, Cleansing,
3	Amla	Fruits of *Emblica officinalis*	Ascorbic Acid, Gallic Acid, Emblicanin A, Emblicanin B	Antioxidant, Anti-Inflammatory, Anti-ageing, Antimicrobial.
4	Cucumber	Fruits of *Cucumus sativus L.*	Cucurbitacin D, Vitamin C, Folic acid	Anti-oxidant, Anti-microbial, Cooling, Soothing.
5	Turmeric	Dried rhizomes of *Curcuma longa*	Curcumin and curcuminoids	Anti-oxidant, Anti-aging, Moisturizing, Antimicrobial, Treats acne.
6	Tulsi	Leaves of *Ocimum sanctum Linn*	Oleanolic Acid, Ursolic Acid, Linalool, Rosmarinic Acid	Antimicrobial, Antifungal, Antibacterial, Antioxidant. Anti-aging
7	Clove	Dried flower buds of *Eugenia caryophyllus*	Eugenol, Eugenol acetate, Caryophyllene	Anti-oxidant, Antimicrobial, Antifungal, Anti-Inflammatory.

Table 3 : Common Herbs Used in Herbal Cosmetics and Their Properties.

DOI: 10.48175/568

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EVALUATION OF HERBAL CREAMS

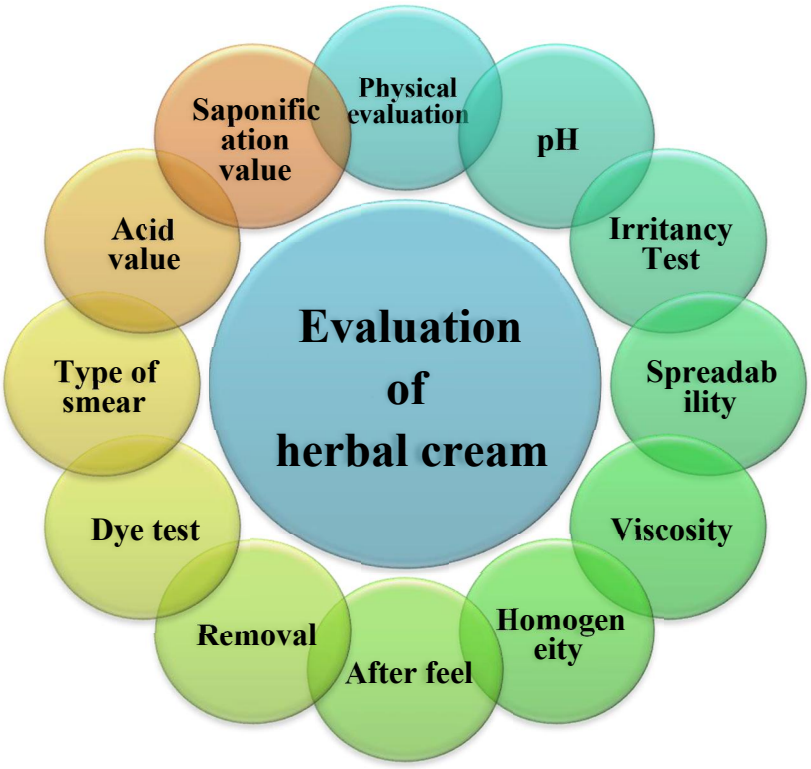

Figure 4: Different parameters of evaluation of herbal creams.

1. Physical Properties
Color: Determined visually.
Odor: Should be pleasant and characteristic.
Consistency: Smooth and uniform without greasiness.
State: Must remain semi-solid.
2. pH Measurement [7,14]
Prepared cream (mixed with 100 ml distilled water) is allowed to stand for two hours and its pH is measured thrice using a digital pH meter.
3. Irritancy Test [8]
A small amount is applied to a marked 1 cm^2 skin area and observed for erythema, swelling or irritation over 24 hours.
4. Spreadability [7]
Calculated using:
$S = m \times l / t$
Where m = weight applied, l = distance traveled, t = time.
5. Viscosity [7,15]
Measured using a Brookfield viscometer with spindle no. 7 at 100 rpm.
6. Homogeneity [7]
Checked visually and by touch for uniform texture.
7. After-Feel
Assessed for slipperiness, smoothness and residual film.
8. Washability
Checked by rinsing with water to evaluate ease of removal.

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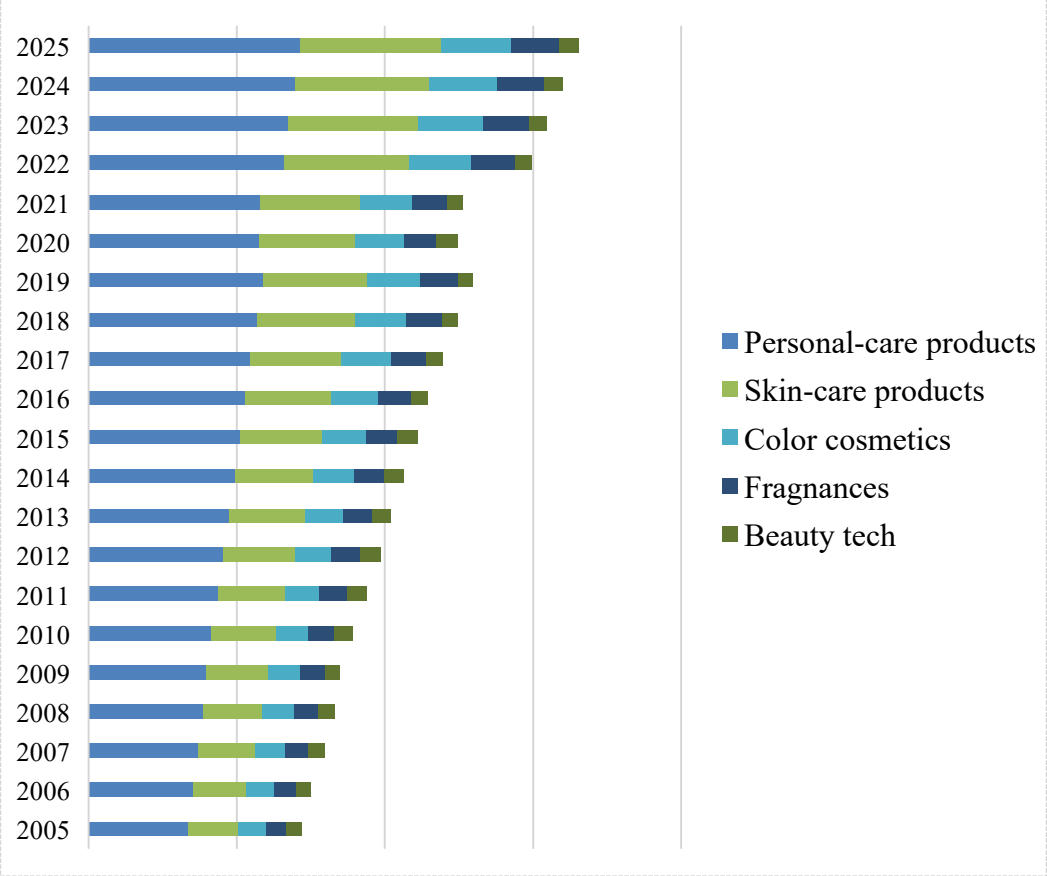
9. Dye Test [14]

Used to confirm cream type (O/W or W/O) under the microscope after mixing with scarlet dye.

10. Acid Value & Saponification Value [14]

Standard titration methods are used to determine the quality of oils used.

GLOBAL MARKET OUTLOOK FOR HERBAL COSMETICS



Graph 2: Global Beauty Industry Retail Sales

The herbal cosmetic industry has shown steady global expansion. A 2023 report estimated a CAGR of 6.83% between 2022 and 2027, forecasting a market value increase of $34.64 billion.

Additional estimates include: [4,10]

2021: $18.84 billion
2022: $75.1 billion
2023–2028: Expected CAGR of 5.6%, reaching $104.43 billion
2023–2032: Predicted CAGR of 5%, reaching $137.79 billion
2024–2029: Estimated CAGR of 6.9%, reaching $155.11 billion

II. CONCLUSION

Herbal creams have emerged as a preferred alternative to synthetic skincare products due to their safety, biocompatibility and richness in natural nutrients. These formulations incorporate bioactive plant compounds that nourish the skin, improve elasticity, enhance complexion and address conditions such as dryness, inflammation and aging**[2,4,5].** With

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growing global interest in natural and sustainable beauty products, the herbal cosmetic sector has gained notable commercial importance. Continued research into their safety, efficacy and consumer satisfaction will further strengthen the future of the herbal skincare industry**[10,36].**

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