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Review Article

The Rise of Herbal Face Creams in Modern Cosmetics

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ABSTRACT

Pigmentation is a process in which the skin darkens due to increased melanin production, often resulting from prolonged exposure to ultraviolet (UV) radiation. While UV rays are essential for vitamin D synthesis, they also stimulate melanin production, leading to skin pigmentation. Skin discoloration and tanning have become common concerns today. To address this, depigmenting agents are often used to lighten the skin. In the present study, we developed an herbal cream formulated with natural ingredients known for their anti-inflammatory and antioxidant properties, which help in reducing pigmentation. The cream contains Papaya Pulp, Aloe Vera, Pomegranate Peel Powder, and Orange Peel Powder all of which are believed to inhibit the activity of tyrosinase, the enzyme responsible for melanin production. Regular use of this herbal cream may effectively lighten pigmented skin by reducing melanin levels.

INTRODUCTION

Cosmetics have been used for centuries to enhance beauty and improve skin appearance. The term "cosmetics" is derived from the Greek word "kosmestikos," which means "to adorn". In recent years, there has been a growing interest in herbal cosmetics due to their natural composition, enhanced safety, and potential therapeutic benefits. Herbal ingredients in cosmetic products offer advantages such as antioxidant, anti-

inflammatory, antiseptic, and antibacterial properties, and are generally considered to have fewer adverse effects compared to synthetic alternatives [12]. Cream is a sort of semisolid emulsion that is designed for external application and can be either water in oil (w/o) or oil in water (o/w) [1]. Skin pigmentation is characterized by the appearance of uneven brown to dark brown spots on the skin [2]. The pigment known as melanin is what gives human skin its colour.

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Hyperpigmentation is a condition where a significant quantity of the melanin is produced. This typically occurs as a result of the skin being exposed to too much sunlight. The skin cells known as melanocytes begin to produce melanin in response to UV radiation from sunbeams. Darkened areas on the skin appear as a result of this enhanced melanin synthesis. Aloe vera has the ability to lessen facial pigmentation and dark patches. ^[3,4] Cream falls into one of two categories: water in oil emulsion or oil in water. It is applied to the skin's outside or superficial layer, and its primary function is to stay there for a longer amount of time. A skin cream's purpose is to protect the skin from various weather conditions and environmental factors while also providing a calming effect. Cleansing, cold, foundation, vanishing, night, massage, hand, and body creams are among the various kinds of creams. Our primary goal is to create a multifunctional herbal cream that can hydrate, lessen acne and skin irritation, lessen skin conditions like psoriasis, eczema, dry skin, wrinkles, rashes, etc., and give the face a glow ^[5]. One of the oldest and most appealing methods of cleansing the skin is using face packs. Numerous face packs with astringent, cleaning, nourishing, relaxing, and antibacterial properties are described by Ayurveda. Common kitchen and household items can be used to make face packs at home. When it comes to getting fair skin naturally, herbal face packs are less costly and have no negative side effects. Since ancient times, people have utilized herbs for management, attractiveness, and purification. Cosmetics are defined as products used for grooming, washing, improving appearance, or altering one's appearance ^[6]. Almost everyone has acne vulgaris at some point in their lives. It is a very common skin condition (piloosebaceous unit). Although acne is most common among teenagers, a significant portion of men and women in their 20s and 30s also suffer from the condition ^[7]. There are

several types of acne, including comedonal, popular, pustular, cystic, and nodular. The two varieties of comedonal acne are blackheads and whiteheads, and they are both non-inflammatory. Blackheads (open comedo) appear as open pores holding dark-coloured skin roughage made up of melanin, sebum, and follicular cells, while white heads (closed comedo) appear as fresh or white-coloured, elevated lumps. Papules are raised, solid, crimson lesions that are frequently smaller than 5 mm in diameter. Pustules are elevated patches of skin that are surrounded by purulent substance. Solid, raised lesions affecting deeper dermis and subcutaneous tissue are called cysts and nodules. Nodules have a diameter of more than 5 mm, while cysts have a diameter of less than 5 mm ^[8]. Three natural ingredients—neem, tulsi, and sandalwood were used in our preparation. Neem is used to lessen skin scarring, pigmentation, redness, and itching in addition to acting as an antifungal and anti-inflammatory ^[1,9]. Tulsi is used to encourage wound healing and give the skin a radiant appearance ^[10]. Rakta chandan, also known as red sandalwood, is arguably one of the greatest natural ways to get rid of skin tans. Along with efficiently removing tans, it also treats acne and blemishes. To get the best effects, apply frequently.

The Skin: Structure and Characteristics:

The largest organ in the human body in terms of weight and surface area is the skin, commonly referred to as the cutaneous membrane. In adults, it weighs between 4.5 and 5 kilos, or roughly 7% of the entire body weight, and occupies an area of about 2 square meters. The skin's thickness varies according to where on the body it is located. It can range in thickness from 0.5 mm on delicate places like the eyelids to 4.0 mm on the heels, which are the area's most in need of protection. Skin thickness on the majority of the body is between 1 and 2 mm.



Skin pH and its Role:

The skin's pH normally falls between 4.0 to 5.6, which denotes a slightly acidic environment. The composition of the acid mantle, a thin layer of water, sebum, perspiration, and other soluble materials on the skin's surface, is reflected in this acidity. Sweat and sebum's fatty acids combine to create this acidic pH, which is crucial for shielding the skin against germ penetration. By inhibiting the growth of dangerous bacteria and fungi, the natural acidity helps preserve the integrity of the

skin and makes the environment unfriendly to many infections^[13].

Physiology of the Skin:

About sixteen percent of the human body weight is made up of the skin, one of the biggest and most vital organs. since it encompasses the whole body. In some places, the skin has auxiliary structures like glands, airways, and nails in addition to the membrane that lines the body's orifices.

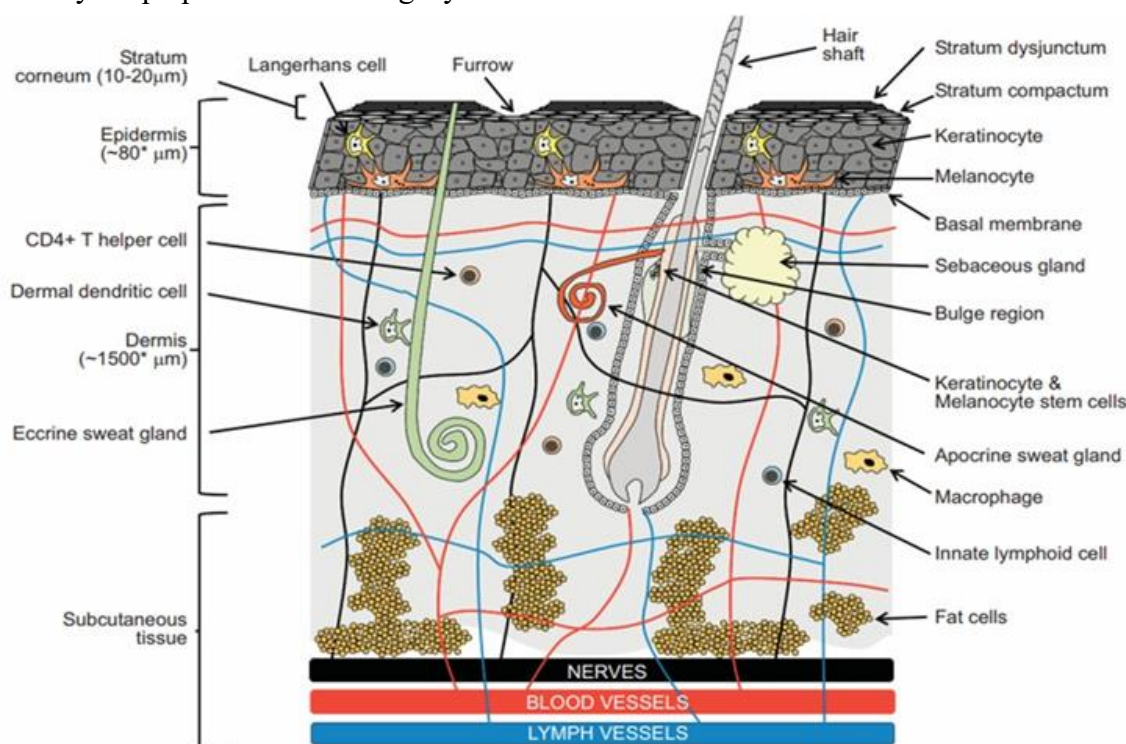


Figure 1: Anatomy of skin

Epidermis: The stratified keratinized squamous epithelium that makes up the epidermis, the skin's outermost layer, varies in thickness depending on the body. On the soles of the feet and palms of the hands, it is the thickest. Although the epidermis lacks blood arteries and nerve endings, the interstitial fluids from the dermis, which supply oxygen and nutrients and drain away as lymph, are present in its deeper layers.

Dermis: The dermis is elastic and hard. Collagen and elastic fibres are interwoven in the matrix, which is made of connective tissue. When the skin is overstretched, elastic fibres rupture, leaving behind permanent stretch scars that might appear in obesity and pregnancy. The dermal cell known as collagen fibres, which bind water and give the skin its tensile strength, is deteriorating. There are different amounts of adipose tissue and areolar tissue underneath its deepest layer.

Subcutaneous gland: The secretory epithelial cells that make up this are generated from the same tissue as the hair follicles. They are found in the skin of every region of the body save the palms of the hands and the soles of the feet, and they release an oily material called sebum into the hair follicles [14].

Functions of skin:

- Protection: An anatomical barrier from pathogens and damage between the internal and external environment in bodily defense, Langerhans cells in the skin are parts of the adaptive immune system.
- Sensation: Contains a variety of nerve endings that's react to heat and cold, touch pressure, vibration, and tissue injury, see stomata sensory system and Hepatics.
- Heat regulation: The skin contains a blood supply far greater than its requirements which allows precise control of energy loss by radiations, convection and conduction.
- Control of evaporation: the skin provides a relatively dry and semipermeable barrier to fluid loss. Loss of this function contributes to the massive fluid loss in burns [14].

Mechanism:

when the topical medication is applied to the skin. It will spread to the stratum corneum, the skin's outermost layer. The medications can penetrate the skin in three different ways. The appendages are the first path. In order to get beyond the stratum corneal barrier, the drug molecules will be divided into the sweat glands through what is referred to as the "first cut." Drug molecules typically remain in the stratum corneal bilayer lipids if they are not delivered by the "first cut." From there, they enter the deeper layer of the skin, known as the

subcutaneous layer, via either transcellular or paracellular pathways. According to the paracellular pathways, the solutes move through the cell-to-cell interface. Topical medication molecules must move between cells but across the stratum corneum, an area that is quite adipose, when they are transported by paracellular pathways. Conversely, the transcellular pathway may be used by the topical medication molecules. This pathway enables the movement of chemicals through cells. The drug molecules are transported into the stratum corneum's bilayered lipid cells via the transcellular route. The medication molecules will diffuse through the water-soluble environments found inside the stratum corneum's bilayered lipids and reach deeper skin regions. The keratin, which is a component of the stratum corneum of the skin, may bond to the topical medication molecules during their transit [14].

Cream:

Creams are semisolid dosage forms designed to be applied topically to the skin, applied to the surface of the eye, or used rectally, vaginally, or nasally for therapeutic, preventative, or aesthetic purposes. These formulations are used to treat localized effects brought on by pharmaceutical penetration into the mucous membrane or skin layer underneath the application site. With the skin acting as the target organ, these products are designed to deliver medications into the skin to treat dermal disorders [11].

Herbal Creams:

Since ancient times, herbal creams have been used as natural treatments for a variety of skin conditions and aesthetic enhancements. Herbal creams, which use botanical extracts' medicinal qualities to nourish, protect, and revitalize the skin, are made from plant-based ingredients and provide a comprehensive approach to skincare [15].



Types of herbal creams:

a) Oil-in-water (O/W) Creams: Oil-in-water (O/W) creams are defined as creams that are composed of tiny oil droplets dispersed over a continuous phase. On the other hand, an oil-in-water (O/W) emulsion is one that has oil droplets scattered throughout the aqueous phase.

b) Water-in-oil (W/O) Creams: Creams that contain water and oil in a continuous phase are called water-in-oil (W/O) creams. If the dispersion medium is oil and the dispersed phase is water, the emulsion is referred to as water-in-oil (W/O) type^[16].



Figure 2: Different Marketed Herbal Cream

Types of Method for preparation:

1. Slab method: The components are mixed until a uniform preparation is attained. One small scale, as in extemporaneous compounding, other will use an ointment mill. If components of an ointment react with metal hard rubber spatula may be used. Put this cream on the slab and add few drops of distilled water if necessary and mix the cream in a geometric manner on the slab to give a smooth texture to the cream and to mix all the ingredients

properly. This method is called as slab technique or extemporaneous method of preparation of cream.

2. Trituration method: Use for finely divided insoluble powder particles or liquid. Insoluble powder is added by geometric dilution. Liquid is added by making well in centre and avoid air pocket formation. Reduce the solid medicament to fine powder medicaments is mixed with small amount of base on ointment

slab with a stainless-steel spatula until a homogenous product is formed.

3. **Fusion method:** Fusion is the act or procedure liquefying or melting by the application of heat. By fusion method, all or some of the components of an ointment are combined melted together and cooled with constant stirring until congealed. Ointment base is melted decrease order of their melting point. Highest melting point should be melted first low melting point next. This avoid over heating of substance of low melting point incorporate medicament slowly to the melted mass stir thoroughly until mass cools down and homogenous products is formed ^[21].

Benefits Of Herbal Cream

- Treats pimples and acne
- Controls excess oil secretion
- Makes the skin softer and smoother
- Maintains pH balance of the skin
- Suitable for all skin types
- 100% cruelty-free
- Easily available
- Economical
- It enhances the energy level of the body
- Variety of Phyto-constituents can be incorporated ^[17].

IDEAL PROPERTIES OF HERBAL CREAM

- It should liquefy at body temperature
- It should not normally be diluted

- Should give a cooling effect on the skin after external application
- Less greasy than ointment and easily spread on the skin
- The pH of the cold cream must be optimum from 4.6-6.0
- It should penetrate the epidermis (via natural process)
- Its viscosity should be low enough to permit easy spreading
- It should be non-toxic
- The excipients should be compatible with each other
- It should be sterile
- It should be non – irritant
- It should be non – inflammatory ^[17].

Advantages of Herbal Creams:

- They have no adverse side effects and don't cause allergic reactions.
- They blend very well with skin and hair.
- These cosmetics work far better than other small quantity cosmetics.
- Plant extracts reduce the bulk qualities of cosmetics and provide the necessary pharmacological effects.
- Simple to find and present in a wide range of plants.
- Their herbal ingredients are more stable, pure, and effective.



- Simple to produce.
- Herbal cosmetics are easy to handle and store for a longer amount of time.
- Low-priced ^[18].
- Herbal Skin Care: Lavender Bath Powder and Soap, Silk Soap and Conditioner.
- Herbal lip cosmetics: herbal lip plumper, herbal lip balm, herbal lip balm, and herbal lip gloss.

Disadvantages of Herbal Creams:

- Chemicals and/or additives may irritate the skin causing contact dermatitis
- Some chemicals have poor permeability to the skin
- Allergic reactions may occur
- Use of drugs that require less plasma is too much to benefit
- Epidermis Enzyme causes massive epidermal denaturation
- Using drugs that require Drugs with very small plasma size are not easily absorbed by the skin ^[19].
- Eye cosmetics: eye shadow, eye colour, eye make-up, liquid eyeliner
- Herbal Creams, Lotions, Gels: Face cream: rich face cream and hand cream, Aloe Vera Moisturizing Hand Cream.
- Herbal Oils: Herbal oils are effective in the treatment of hair loss, hair loss, thinning hair, itchy scalp and itching.
- Herbal Fragrances and Fragrances: Citrus Fragrances: Light, fresh citrus notes (bergamot, orange, lemon, petitgrain, mandarin, etc. fruit, and chypre) ^[19].

Comparison between the Herbal Cream and Synthetic Cream:

Application of Herbal Creams:

Aspect	Herbal Cream	Synthetic Cream
Source of Ingredients	Contains natural ingredients like plant extract (e.g., neem, aloe vera) and essential oils,	Contains chemically synthesized compounds like parabens, silicones, and petroleum derivatives.
Mode of Action	Works gradually; aims to heal and balance skin naturally.	Provides quick effects; may focus on symptoms rather than causes.
Side Effects	Generally safer; fewer side effects, though allergic reactions are still possible.	May cause skin irritation, allergies, are long term sensitivity.
Preservatives	Uses natural preservatives; shorter shelf life.	Contains synthetic preservatives for longer shelf life.
Eco- Friendliness	Environmentally friendly if ingredients are sustainably sourced.	May contain non-biodegradable or harmful substance ^[20] .

Herbs used in the herbal face cream:

Ingredients	Parts used	Uses
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Aloe Vera	Leaf gel	Moisturizing, soothing sunburn, healing acne, anti-inflammatory, cooling
Turmeric (<i>Curcuma longa</i>)	Rhizome (root)	Anti-inflammatory, anti-bacterial, reduces acne and scars, brightens skin
Neem (<i>Azadirachta indica</i>)	Leaves, bark	Antibacterial, anti-fungal, treats acne, controls excess oil, purifies skin
Rose (<i>Rosa</i> spp.)	Petals, rose water (distillate)	Hydrating, soothing, toning, anti-aging, reduces redness
Sandalwood (<i>Santalum album</i>)	Heartwood (powder or oil)	Brightens complexion, soothes irritation, anti-tanning, anti-acne
Tulsi (<i>Ocimum sanctum</i> / Holy Basil)	Leaves	Antioxidant, antibacterial, purifies skin, prevents blackheads
Licoricey (<i>Glycyrrhiza glabra</i>)	Root	Skin lightening, treats hyperpigmentation, anti-inflammatory
Chamomile (<i>Matricaria chamomilla</i>)	Flowers	Calming, anti-inflammatory, soothes sensitive skin, treats eczema
Calendula (<i>Calendula officinalis</i>)	Flowers	Heals dry/damaged skin, reduces redness, anti-inflammatory
Green Tea (<i>Camellia sinensis</i>)	Leaves	Antioxidant, reduces sebum, soothes irritated skin, fights aging

Evaluation Parameters:

To ensure the quality and stability of herbal cold creams, various evaluation parameters are employed. These include:

➤ pH Measurement:

A digital pH meter can be used to determine the pH level of the herbal cream. The cream is mixed with 100 mL of distilled water and allowed to stand for two hours. The pH is checked three times, and the average value is calculated

➤ Irritancy Test:

at regular an area of one square centimetre is outlined on the left dorsal side. The cream is applied to the marked area, and the starting time is noted. Any signs of irritation, redness, or swelling are checked and documented intervals over a 24-hour period.

➤ Spreadability:

A sufficient quantity of cream is applied onto two glass slides and pressed together with a weight of 100 grams for 5 minutes. The spreadability is evaluated by observing the movement of the top slide relative to the bottom slide or by noting the time required to separate them.

➤ Viscosity:

The viscosity of the herbal cream is measured using a Brookfield viscometer with spindle no. 7 operating at 100 rpm.

➤ Dilution Test:

The dilution test identifies the type of emulsion by mixing it with either water or oil. An O/W emulsion will mix completely with water but separate when mixed with oil, while a W/O



emulsion will blend with oil but separate when mixed with water ^[12].

➤ Removal:

The ease of removal of the herbal creams applied was examined by washing the applied part with tap water.

➤ Dye test:

The scarlet dye is mixed with the cream. Place a drop of cream in a slide and cover with a cover slip and examine it under a microscope. If the disperse globule appears red and the ground colourless then it is o/w type and the reverse condition appears in w/o type of creams ^[21].

CONCLUSION:

Herbal creams incorporating natural herbs have gained significant popularity due to their natural composition, enhanced safety, and potential therapeutic benefits. The formulation and evaluation of these creams involve careful consideration of the physiology of the skin, the mechanism of action of topical formulations, and the ideal properties of the cream. The incorporation such as neem, coconut, almond oil, and enhances the therapeutic potential of herbal creams by providing moisturizing, anti-pigmentation, skin brightening, and anti-aging properties. The evaluation of these creams using parameters such as pH measurement, irritancy test, spreadability, viscosity, and dilution test ensures their quality and stability. As the demand for natural and safe cosmetic products continues to grow, there is a need for further research to develop innovative and effective herbal cream formulations.

Conflict of interest: - No conflict of interest.

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