



Review Article

A Comprehensive Review on the Role of Marigold (*Tagetes Erecta*) In Dermatological Formulations and Shave Care

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The growing preference for herbal cosmeceuticals is driven by concerns over the negative impacts of synthetic ingredients in personal care products. The current study centers on developing and assessing a herbal shaving lotion enhanced with the floral extract of Marigold (*Tagetes erecta*). Marigold is well-known for its strong anti-inflammatory, antiseptic, and healing properties, largely because of bioactive substances such as flavonoids and carotenoids. In this study, a stable lotion base was used with the addition of marigold extract. The formulation was created with different levels of the extract and tested for multiple physicochemical properties, such as pH, viscosity, spreadability, and emulsion stability. Preliminary phytochemical screening verified the presence of important secondary metabolites. To guarantee consumer safety, skin irritancy tests were performed, showing that the formulation is non-irritating and gentle on the skin. The results show that the marigold-based shaving lotion not only ensures a smooth shave but also provides therapeutic benefits by speeding up the healing of small nicks and cuts. This study finds that *Tagetes erecta* serves as a practical, environmentally friendly, and efficient substitute for synthetic antiseptics in men's grooming products, opening the door to sustainable herbal skincare options.

Keywords: *Tagetes erecta*, Marigold extract, Herbal Shaving Lotion, Formulation, Evaluation, Skin Healing, Cosmeceuticals.

INTRODUCTION

Wet or dry shaving causes the removal of skin as well as hair from the face. The total quantity of skin and hair removal can vary depending on the individual. Similarly, the percentage of skin in the shaving debris can range between 25 and 75 percent. Much of the skin removed is the epidermal horny layer which would be shed naturally without shaving. The skin trauma associated with shaving occurs when the outer horny layer is penetrated. Damage is most likely to occur at follicular hairshaft openings. A second source of irritancy in shaving is from shaving preparation. The degreasing effect of soaps and synthetic surfactants can increase skin permeability and allow alkali and other irritants to reach the malpighian cells. The purpose of after shave preparation is to relieve the slight irritation or afterglow and provide a pleasant feeling of comfort and well being after shaving. This is achieved by

giving a slight coolness, anesthesia, mild astringency, or emolliency to the skin. At the same time, the preparation should be antiseptic and help to keep the skin free from bacterial infection during the short time it takes to recover from the slight degree of injury inflicted during the shaving operation. The extent to which these properties are emphasized depends on the type of formulation.

Skin-

Cosmetics are classified according to the way people use them such as men's cosmetics, women's cosmetics and children's cosmetics. It can also be classified according to the area used as skin cosmetics, hair cosmetics, nail makeup and color makeup arrangements, oral preparations. Cosmetics for skin include creams, lotions, sunscreens, etc., cosmetics

for hair include shampoo, conditioner, hair colorants, hair straighteners etc., cosmetics for nails include nail paints, cuticle creams, removers etc. colored make up

preparations include lipsticks, eye shadow, eye liners, etc., oral preparations include tooth pastes, tooth powder, oral hygiene products, etc.

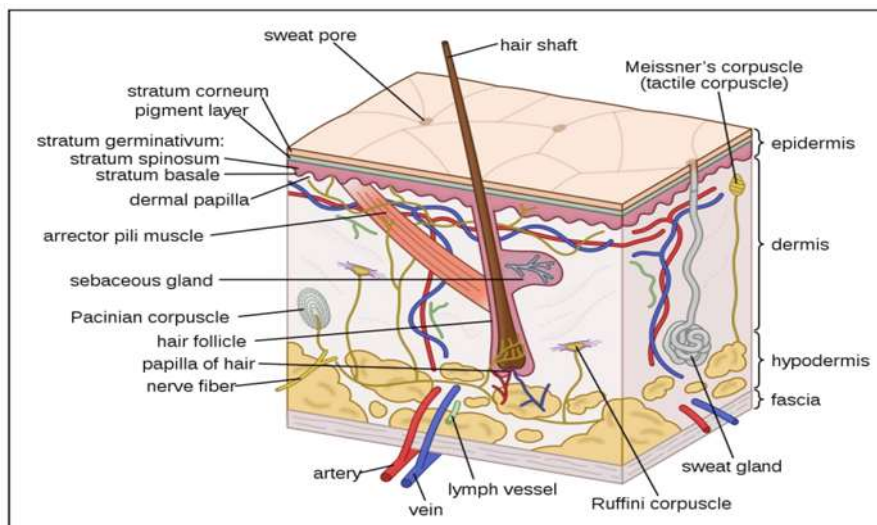


Fig No.1. Skin

The skin is largest organ of our body. It is a protective wrap which covers the whole body. The differences in the skin colour are due to amount of melanin produced, not in the numbers of melanocytes present. Pigmentation can be enhanced by exposure to sun or by endocrine factors. The major function of melanin is undoubtedly protection against solar radiation. It is a natural sunscreen agent.

The capabilities of skin are as follows-

- Offers a protective barrier against, mechanical, thermal and bodily damage and dangerous substances.
- Prevents moisture loss
- Reduces dangerous outcomes of UV radiation.
- It acts as a sensory organ (touch, detect, temperature)
- Find the immune organ as to protect against infections.
- Production of vitamines D.
- Controls loss of valuable fluid.

- Prevents the ingress of harmful foreign material and radiation.
- Cushions against mechanical shocks
- Regulates heat loss.
- Transduces incoming stimuli.

The skin also has various colour, texture and odor, transmits sexual and social signals. The skin has main three layers.

1. The epidermis
2. The dermis
3. The subcutaneous layer

1.2.1 Epidermis: -

The epidermis is an elastic layer. It consists of a number of layers. The stratification is the result as it changes in the keratinocytes as they move outwards from the basal layer, in which they are continuously formed by mitosis, to the skin surface where they are lost. This process is called cornification or keratinisation. The oldest cells are shed from the skin layer and horny cells formed below take their place. Three other cell types are present: melanocytes or

pigment cells, langerhans cells, which are colorless and dendritic in form and merkel cells which are concerned with sensation.

The layers of epidermis are: -

- stratum corneum,
- stratum lucidum,
- stratum granulosum,
- stratum spinosum,
- stratum germinativum (additionally referred to as stratum basale).

In its simplest form an aftershave is a clear aqueous ethyl alcohol solution containing a perfume. The desired balance of mild astringency and coolness is achieved by controlling the ratio of ethyl alcohol to water. The commercial success of an aftershave is largely dependent on the perfume and the way in which the product is marketed. Many different perfume types for example spicy, sandalwood, leather and tobacco have been successful. The creation of perfume which is free from components likely to cause skin irritation or sensitization is the province of the perfumer. Chemical composition of the perfume determines the maximum concentration at which it can be used in a particular water-alcohol mixture. So here the attempt is made to make marigold water aftershave lotion keeping all the above things into consideration.

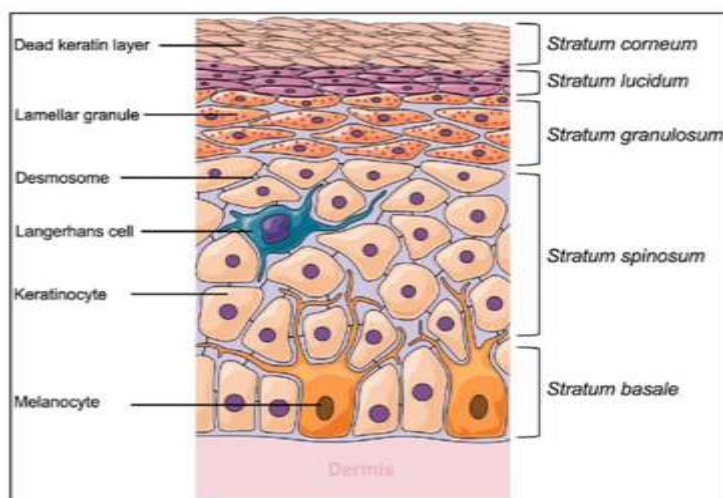


Figure No. 2: Structure of epidermis

1.2.1.1 Stratum Corneum

The stratum corneum is the outer layer of the skin (epidermis). It acts as a major barrier between body and the environment. Stratum corneum: outer layer of skin, consisting of layers of strong and special skin cells and keratin. Stratum corneum is an impenetrable barrier that acts as a barrier to survival on outside surfaces which includes bacteria, fungi, and chemical compounds along with stopping the loss of fluids and solvents internally. It has very thick layers at the arms and the flats of the feet. In stratum corneum, keratinocyte is absolutely keratinized or flattened and has no nuclei beneath favorable conditions. In addition, the desmosomes that preserve the keratinocytes collectively started to vanish or now no longer

characteristic on this layer. In the top stratum corneum, the action of enzymes, along with steroid sulfate, breaks down components of the lamellar debris that serve to restore molecular adhesion within the stratum corneum, mainly to the extinction of the extra cells. The stratum corneum hydration is essential for the proper functioning and skin appearance. Moisture can be measured in vitro using gravimetry or an electron microscopy, or in vivo magnetic resonance techniques. Stratum corneum is often described as a brick-and-mortar type structure. In this analogy, the "bricks" are corneocytes, which originate within the innermost layer of dermis, the stratum spinosum, as cells referred to as keratinocytes. As the cells suggest, keratinocytes by and large include keratin. As those cells circulate through

components of dermis to the stratum corneum, they lose their nucleus and disperse. It's at this factor that they may be taken into consideration corneocytes. Each corneocyte is about a micrometer thick, although the thickness of corneocytes also depends on factors such as a person's age, exposure to ultraviolet (UV) radiation, and their location on the body. For example, they tend to be thicker on the hands and feet and thinner in more delicate areas such as around the eyes. Desquamation, too, is the clinical name for the destruction of dead corneocytes on the surface of stratum corneum. For this process to take place, certain enzymes cause the destruction of the corneodesmosomes. How these enzymes are activated isn't fully understood. It is known, however, that the cell cycle in the stratum corneum—from the time a cell is formed until it is shed—takes approximately 14–28 days. Having a basic understanding of how stratum corneum is formed and how it works can be helpful for skin care. Frequent cleansing, use of harsh exfoliants, and skin rejuvenation it can strip the skin's outer layer of natural lipids and protection properties. Exposure to the sun can also damage the stratum corneum. Everyone's skin is different, Natural moisturizing factor (NMF) consists of water-soluble compounds which are located best withinside the stratum corneum. These compounds incorporate about 20%–30% of the load of the corneocyte. NMF additives take in moisture from the ecosystem and integrate it with their very own water content, permitting the outermost layers of stratum corneum to live hydrated no matter publicity to the elements. Because NMF components are water-soluble, they may be effortlessly leached from the cells upon touch with water, that's why repeated touch with water truly makes the pores and skin drier. The lipid layer across the corneocyte facilitates to shut the corneocyte to save you NMF loss.

1.2.1.2 Stratum Lucidum

Stratum lucidum is a Latin word, meaning “plain”. The word is derived from its light when viewed through a microscope. This layer is found mainly on the skin of the palm and plantar. The presence of stratum lucidum makes the palm and plantar skin firm. The skin on other parts of the body does not contain stratum lucidum. Its presence underscores the importance of having sensitive skin to protect it from

frequent exposure to mechanical stress. Stratum lucidum is found between stratum corneum and stratum granulosum. The keratinocytes are filled with eleidin (a protein that may be later converted to keratin. The function of it is to protect the area's most common to damages such as palms of the hand, side fingers and the bottoms of the feet. It is usually an extra layer of skin.)

1.2.1.3 Stratum Granulosum

Stratum granulosum is commonly the equal thickness because stratum corneum, from one to 10 cells thick. Keratinocytes in stratum granulosum is flat and feature a extra uncommon form than the ones withinside stratum spinosum, and feature deeper basophilic keratohyalin particles. Keratinocytes withinside the granular layer additionally launch Odland bodies, lamellar granules and keratinosomes that play a position in developing water barrier and facilitating mobileular adhesion to the stratum corneum As keratinocytes mature and migrate up into the stratum corneum, they start to put together for the dissolution in their nucleus and different organelles.

1.2.1.4 Stratum Spinosum

Stratum spinosum is a feature on human skin, but no visible on thin skin of a mouse, although it was present in thick skin of the paws. Stratum spinosum is visible in the keratinised epithelium of the esophagus and front-abdomen. Stratum spinosum cells are attached to desmosomes; there is a small space in between cells. The cytoplasmic filaments (central fibers or tonofilaments) of epithelia are made of keratin running on the desmosomes. The stratum spinosum cells are undeniably alive, indeed moving, or pushing, upward.

Stratum Germinativum

The stratum basale is a row of columnar or cuboidal resting cells at the basement membrane quarter that separate the epidermis from dermis. Most of those cells are keratinocytes which are continuously reproducing and pushing upward to fill up the epidermal cells above. The daughter cells flow into the outer layers of the epidermis and are in the long run shed as dead horny cells.

1.2.2 Dermis

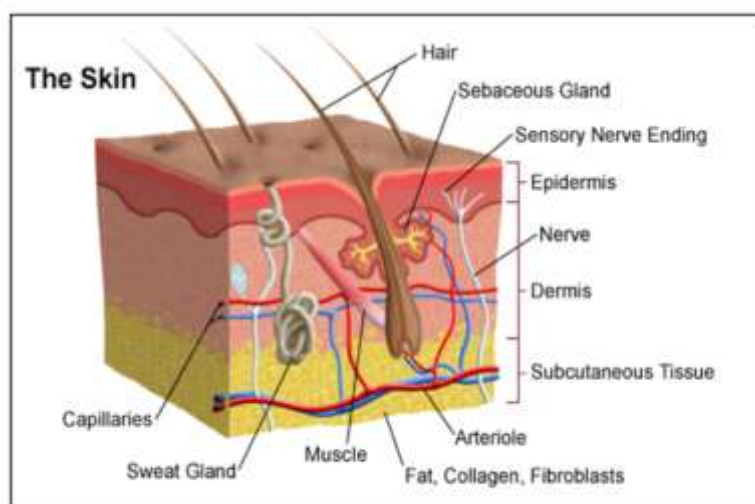


Figure No.3: Structure of dermis

The layer below epidermis is called dermis. The dermis contains a network of blood vessels, hair follicle, sweat glands and sebaceous glands. Beneath the dermis are subcutaneous fatty tissues. Bulbs of hair project into these fatty tissues. These are more sebaceous glands in the proximity of hair. These glands encompass small saccules which speak via a duct commencing both into the neck of the hair follicle or immediately directly to pores and skin surface. These glands secrete sebum, an oily fluid which lubricates the hair shaft and pores and skin.

1.2.3 Subcutaneous Fatty Layer

Subcutaneous tissue is the deepest layer of your skin. It is made up in general of fat cells and connective tissue. The majority of your frame fat is stored right here. The subcutaneous layer acts as an insulating layer to protect your inner organs and muscle mass from surprise and modifications in temperature. The kinds of cells located in the layer are fibroblast, adipose cell, and macrophage. The subcutaneous tissue is derived from the mesoderm, however in contrast to the dermis, it isn't always derived from the mesoderm's dermatome area. It is composed in the main of unfastened connective tissue, and consists of larger blood vessels and nerves than those located in the dermis. Aftershave is a product spread on to skin after shaving. Traditionally it is an alcohol based liquid (splash), but it may be a lotion, gel, or even a paste. It often contains an antiseptic agent such as denatured alcohol, stearate citrate or witch hazel to

prevent infection of cuts and act as an astringent to reduce skin irritation. Menthol is used in some varieties as well to soften and cool irritated skin. Alcohol-based aftershaves usually cause an immediate stinging sensation after use, with the effects sometimes lasting a few minutes but most often just a few seconds. There are also non-alcoholic products. Aftershave balms are often recommended for winter use because they do not contain alcohol and resemble a lotion, moisturizing the skin. Some aftershaves use fragrance or essential oil to enhance scent. Moisturizers natural and artificial often touted as a skin softener.

Botanical and Phytochemical Profile of Marigold

Marigold is a rich source of bioactive secondary metabolites.

- **Flavonoids (Quercetin):** Known for its powerful antioxidant and anti-inflammatory action.
- **Carotenoids (Lutein):** Provides protection against UV radiation and aids in skin repair.
- **Essential Oils:** Act as natural antimicrobial agents, reducing the risk of post-shave infections.

Potential Benefits in Shaving Formulations

1. **Antiseptic Property:** Marigold extract acts against common skin pathogens (e.g.,

Staphylococcus aureus), preventing folliculitis (shaving bumps).

- 2. Wound Healing:** It promotes cell regeneration, which is crucial for healing minor nicks and cuts during shaving.
- 3. Soothing Effect:** It reduces redness and "razor burn" by inhibiting inflammatory cytokines.

Formulation Development

- **Oil Phase:** Stearic acid, Cetyl alcohol (for consistency).
- **Aqueous Phase:** Glycerin, Purified water, and Marigold extract (1-5%).
- **Emulsifier:** Triethanolamine or Potassium hydroxide.

- **Preservatives:** Methylparaben or natural alternatives like Vitamin E.

5. Evaluation Parameters

- **Organoleptic Evaluation:** Checking color, odor, and texture.
- **pH Determination:** Must be skin-compatible (pH 5.5 to 6.5).
- **Viscosity & Spreadability:** Ensuring the lotion spreads easily over the beard area.
- **Stability Studies:** Testing the formulation at different temperatures (accelerated stability).
- **Patch Test:** Evaluating skin irritancy on human volunteers.

Marigold Flower: -



Fig No.4. Marigold Flower

Marigold was first discovered and known by the Portuguese in Central America in the sixteenth century. They then introduced these flowers to Europe and India. Historically, the Greeks, Romans, Indians, and Arabs all used this plant as a medicinal plant, dye, flower, and cooking ingredient. The golden yellow color of the marigold reflects the color of the Arya era. Marigold is one of the traditional flowers used in garlands and offerings in Maharashtra from Navratri till Diwali. Due to increased or ample availability of water, marigolds are grown in large production in Nashik district. Nashik is a major centre or hub for the marigold market, due to its high accessibility and easy modes of transportation available in other major cities. Marigolds are mostly used in all kinds of rites, rituals and sacred works. It is also known as the

religious flower of India. Calendula is one of the most important flowering plants and year grown or grown in India. It became popular thanks to its simple culture and wide flexibility, wide attractive colors, shape, size and excellent storage quality. There are usually two cultivated types of marigold. They are: African marigold - *Tagetes erecta* and French marigold - *Tagetes patula*. The leaves, pollen and branches are full of triterpenoid esters (anti-inflammatory), antioxidants and carotenoids that make the flower active. Currently, calendula products are used as bactericidal, antiseptic, antiviral and anti-inflammatory to treat different skin diseases and pains. In cosmetics, it is majorly used for oil extraction as a skin healing agent, anti-inflammatory agent, wound healing agent, and as a perfume

additive. The flavonoids and saponins present in the plant have been shown to not only promote skin healing, but also significantly reduce inflammation. It is an excellent treatment for bruises, cuts, ulcers, cuts, rashes, eczema and more. On the skin, marigold is used to treat inflammation, tenderness, redness, and even thirst. The essential oil and distilled flower water are said to be very effective in reducing UV damage and preventing the signs of aging. Calendula flowers are called the "herb of the sun" and the sweet fragrance of these flowers helps improve mood and control stress. The orange and yellow colors of marigolds are considered good for new beginnings and important events in human life. Calendula (*Calendula*), a member of the Asteraceae family, commonly known as English Marigold or Pot Marigold is an aromatic plant used in the traditional systems of medicine to treat wounds, ulcers, boils, scars, skin injuries, colds and to purify the blood. It is majorly used for its various biological functions in the treatment of diseases such as analgesic, anti-diabetes, anti-ulcer and anti-inflammatory. It is also used for gastro-intestinal diseases, gynecological problems, eye diseases, skin injuries and some cases of burn. Calendula oil is still used as an antiseptic, as well as for wound healing. Pharmacological studies of the plant indicate that extracts of calendula have antiviral and antigenotoxic properties in vitro. In herbal medicine, calendula is used in suspension or tincture to treat acne, reduce inflammation, control bleeding and irritated tissue. Calendula is used to protect against the plague. In original American Shaker medicine, marigold was a cure for gangrene. In addition to his first aid use, marigold acts as a magical digestive remedy. Taking a tincture of the flowers taken internally helps treat yeast infections and diarrhea. *Calendula officinalis* infusion can also be

used in treatment of bee stings, eye infections, ulcers and abscesses, varicose veins, eczema and as a mouthwash for ulcers or to relieve toothache. It improves blood circulation and lymph nodes and helps remove toxins from the body. This plant is rich in many active pharmaceutical components such as carotenoids, flavonoids, glycosides, steroids and sterols, quinines, volatile oils and amino acids. The extract of this plant and the pure compound isolated from it has been shown to have many pharmacological activities such as anticytotoxic, hepatoprotective and spasmolytic etc. Studies with potent toxins in mice and rats indicate that the release is not toxic. Animal tests show minimal skin irritation and no photosensitivity or toxicity. Minor ocular irritation is seen in one form and no irritation in others. Six saponins are separated from *C. officinalis* flowers. *Calendula officinalis* i.e. marigold had not changed in the Ames test, and the tea taken from *C. officinalis* was not genotoxic in *Drosophila melanogaster*. This review examines the organoleptic, in-vitro and in-vivo pharmacological activities as well as the description, cultivation and active chemical constituents of *Calendula officinalis* in order to provide information about this plant as well as highlight its multi-active properties as a medicinal agent. Marigold scientifically called as *calendula officinalis* belonging to family Asteraceae is a rich source of saponins, triterpenoidal esters, and flavonoids, etc. *Calendula officinalis* has many therapeutic effects including antibacterial, antifungal, anthelmintic, antiviral, cytotoxic, hepatoprotective, cardioprotective, gastroprotective, wound healing, and many other effects

- Taxonomical classification of Marigold (*Calendula officinalis*) as below:

Table No.1: -Taxonomical classification of marigold (*Calendula officinalis*).

Kingdom	Plantae
Subkingdom	Tracheobionta
Division	Magnoliophyta
Class	Magnoliopsida
Subclass	Asteridae
Order	Asterales
Family	Asteraceae
Tribs	Calenduleae
Genus	<i>Calendula</i>
Species	<i>C. Officinalis</i>

- Taxonomical classification of Marigold (*Tagetes Erecta*) as below.

Table No: -Taxonomical classification of marigold (*Tagetes Erecta*).

Kindom	Plantae
Unranked	Angiosperms
Unranked	Eudicots
Unranked	Asterids
Order	Asterales
family	Asteraceae
Subfamily	Asteroideae
Tribe	Tageteae
Genus	<i>Tagetes</i>
Species	<i>Erecta</i>

Floral waste management has yielded good results in Ajmer's Dargah Sharif, where the flowers generated regularly are recycled and with the technical assistance from Central Institute of Medicinal and Aromatic Plant, Lucknow, A rose water distillation plant has been established in the outskirts of the city another such example is of Shirdi where rose flowers offered to Saibaba are used to convert rose perfumes, rose water and incense sticks. New design project "Agarbatti Production from Waste Flower": At the Shirdi Shri Saibaba Temple daily a large number of devotees come to worship Shri Saibaba, sending flowers to Shri Saibaba which results in daily production of 2 to 2.5 tons garbage cans. Prior to setting up the Agarbatti processing unit two to 2.5 tons of flower waste was used for disposal at the disposal site. After considering this fact, the Shirdi Municipal Council and Shri Saibaba Sansthan established a polluted flower processing unit to convert it into Agarbatti. Varanasi produces about twenty-one tons of flowers that are thrown away every day and Vrindavan gives about 12.4 tons every day. The most common flowers offered in the temples of the gods are rose, jasmine, marigold, chrysanthemum, hyacinth, hibiscus, etc. In many places, flowers are washed and dried in the sun. They are powdered and mixed with natural dried grapes to make dough that leads to the production of handmade medicinal sticks. Vermicomposting is also an excellent and eco-friendly process for managing flower litter. Coconut shells, cooked in the open for three hours, produce ash from coconut shells that can be used as a partial substitute for cement. Coconut shell concrete can be

used in reinforced concrete structures instead of granite. Flower wastes can also serve as a sustainable source of raw material in handmade paper production. These papers do not contain 100% wood and other harmful chemicals and thus contribute to reducing, reusing and reusing the concept. Thus, floral natural wastes can be used a lot in cosmetics, perfumery and to prepare value added products leading to less environmental pollution and preparation of ecofriendly products.

CONCLUSION

The comprehensive review of "Formulation and Evaluation of Herbal Shaving Lotion Derived from *Tagetes erecta* (Marigold)" confirms that botanical extracts offer a superior and safer alternative to synthetic grooming agents. The study successfully establishes that the incorporation of Marigold floral extract into a lotion base provides significant therapeutic benefits, including antiseptic, anti-inflammatory, and rapid wound-healing properties. Through the detailed analysis of the Skin Anatomy, it is evident that the mechanical stress of shaving causes micro-trauma to the epidermis and dermis. The bioactive compounds in Marigold, specifically Lutein and Quercetin, effectively soothe these micro-fissures and restore the skin's natural barrier. The evaluation parameters—including pH stability, viscosity, and non-irritancy tests—demonstrate that this herbal formulation is not only effective but also skin-compatible and safe for daily use. In conclusion, the development of a Marigold-based shaving lotion

marks a significant step toward sustainable and "Green" cosmeceuticals. By reducing the dependency on harsh chemicals and alcohol-based aftershaves, this formulation ensures a soothing shaving experience while promoting long-term skin health. Future research may focus on the long-term stability of the formulation and its efficacy across different skin types to further validate its commercial potential in the global herbal market.

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