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A Review on Formulation and Evaluation of Herbal Cold Cream

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ABSTRACT

Since ancient times, creams have been regarded as essential topical formulations in cosmetics due to their ease of application and removal from the skin. Pharmaceutical creams are used for a variety of cosmetic purposes, such as cleansing, beautifying, altering appearance, and moisturizing, among other things. It may also be utilized to cure burns, cuts, and wounds on the skin, in addition to safeguarding the skin from bacterial and fungal infections.. Products containing herbs are used in herbal cosmetics to enhance and beautify human appearance. The herbal cold cream used the water-in-oil method and contained plant extract Liquid paraffin serves as a lubricant, beeswax functions as a stabilizer, and methyl paraben acts as an antibacterial agent to nourish and hydrate the skin. Aloe vera, rose oil, Hibiscus Pharmaceutical creams are used for a variety of cosmetic purposes, such as cleansing, beautifying, altering appearance, and moisturizing, among other things.

Keywords: Cold cream, Herbal, Hibiscus rosa sinensis, Saffron, Aloe Vera, Bio-compound.

I. INTRODUCTION

The name "cosmetics" derives from the Greek word "kosmtikos," which denotes strength, organization, and a proficiency in aesthetics. The term "cosmetics" is defined… According to the Indian Act on Drugs and Cosmetics, anything that can be used to clean the human body or any part of it is a cosmetic. This includes, but is not limited toRubbing, pouring, sprinkling, spreading, and various other techniques. Enhancing and advancing.The intended use as a cosmetic component and appearance make up attractiveness [1].

The term cosmetics is defined. According to the Drug and Cosmetic Act (an Indian law),

Cosmetic means anything that is meant to be rubbed, poured, sprinkled, spread, or otherwise applied to the human body or another part for cleaning. Beautifying, promoting, attractiveness appearnees and include Intended for use of a component of cosmetics.

Commission, according to European pharmacopeia, An emulsion of water, some fats, typically beeswax, and a variety of scents is known as a cold cream. These creams are made to remove makeup and smooth skin. Cold cream is a water-in-oil emulsion, whereas vanishing cream is a water emulsion, named for its apparent vanishing effect upon application to the skin. Aloe Vera gel is used as a moisturizer, aids in the healing of burn injuries, reduces acne and zits, and improves skin tone, hyperpigmentation, discoloration, ant aging, and antioxidants. Since then, the term "cosmetics" has been used to describe products that are used to beautify the skin or improve one's appearance. People have been butting their skin with poly herbal or herbal cosmetics since ancient times. [2]

1.1 Human Skin

The skin is the body's biggest organ. The whole body is covered. It acts as a barrier to keep out heat, light, harm, and illness.

Additionally, the skin:Controls body temperature

It serves as a barrier between the body and its surroundings, stores fat and water, is a sensory organ, stops water loss, keeps bacteria out, and aids in the production of vitamin D when exposed to sunlight.

The largest organ in the body, the skin, is composed of minerals and lipids.

The control is in your flesh. lowers body temperature and prevents infections from entering the body. Skin temperature and cold feelings are sensed by nerves. According to human anatomy, the integument, or covering, that covers the body's surface serves as both a protective device and a sensory organ for the outside world. The stratum, the main protective structure, is found in the topmost layer of the skin, the epidermis, which is made up of three layers of tissue. The subcutis

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protects the dermis, a fibrous layer that provides strength and support to the epidermis, and the subcutis, a layer of fat beneath the epidermis that provides nutrition to the other two layers.
[3].

The skin consists of skin layers

- The Epidermis
- The Dermis
- Subcutaneous layer

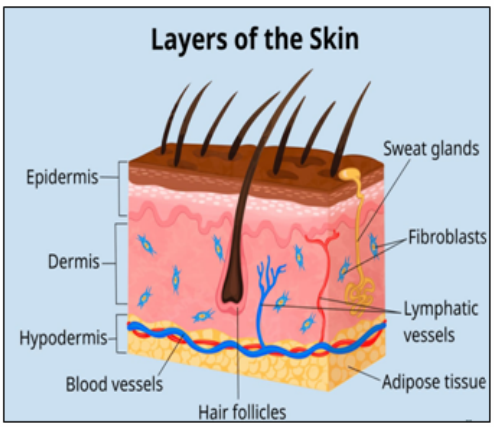

Figure 1: Skin

1.2 Herbal Cold Cream:

The cold cream helps to get rid of waste materials from the skin and restore moisture to dry skin. pores and also cools the body. It can be washed with water quickly and easily. When applied to the skin of the body, they are not irritating. The water phase further protects the skin. It becomes liquefiable at body temperature. It enters the body through the epidermis's pores. The Greek physician Galen is credited with causing the cold. It is believed that the development of cream formulation began in the second century. He combined water, beeswax, and rose. petals. She used them as the main moisturizing element in the cold cream. Galen's cream was the most widely used. this skin care product's name. In addition to hydrating the skin, a cotton ball and cold treatments can be used to erase temporary tattoo marks.
The use of cold creams is also linked to the evolution of children's face paint. [4]

1.3 Skin Care Products

- Cleanser
- Toner
- Moisturizer
- Serum

Figure 2: Herbal cold cream

1.5 Benefits [5]

- It keeps skin from drying out and aging..
- Cold creams protect the skin from harsh environments since they include enough amounts of water and oil.
- They also moisturize and protect the skin.
- Cold creams are designed to remove makeup and smooth out the skin.
- Medicated cold cream is usually administered to the skin as a topical pharmacological dosage form.
- to aid in the maintenance of the skin's moisture balance and prevent rough skin from developing when using cold cream (nonmedicated).
- As a cleaning step before makeup removal
- to provide an emollient effect and an oily protective layer to the skin.
- Moreover, provide a chemical barrier akin to that of sunscreen ingredients.

1.6 Disadvantages:-

- An allergic reaction could occur.
- It works best with medications that depend on extremely low plasma concentrations to produce their effects.
- It is more challenging for drugs with larger particle sizes to be absorbed through Skin pores.
- The possibility that any medication discomfort will lead to skin irritation or contact dermatitis [6].

1.7 Properties:-

- The cold cream should have a pH of 4.6 to 6.0.
- For ease of application and removal from the container, its consistency needs to be at its best.

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- Once applied externally, the skin should cool.
- To stop water from evaporating off its surface, the skin must create a thin, waxy protective coating.
- It ought to have a more rapid emollient action, enabling very dry skin to become softer and plumper more quickly..
- Spreads smoothly over the skin and is less greasy than ointment.
- It should retain its chemical and physical stability for the duration of its shelf life [7,8].

1.1.1.Skin Associated Problem:

1.1.2.Hyperpigmentation

1.1.3.Melasma

Melasma is another common occurrence that can affect a person's quality of life in terms of their emotional and confidence levels. Uneven dark macules, or melasma, are one of the most common causes of hyperpigmentation.

on sun-exposed skin. The most prevalent type of melasma on some people's faces pregnant women as a result of using birth control pills; the forehead, cheeks, upper lip, and chin are usually where the symmetrical hyperpigmentation is most noticeable. Melasma, which can be classified as mixed, epidermal, or dermal, can be detected by Wood's light inspection of the skin.[9]

1.1.4.Acne

One of the most prevalent skin conditions that dermatologists and other medical professionals treat is acne vulgaris. 85% of people will experience this chronic inflammatory skin disease at some point in their lives [10].

1.1.5.Treatment

Treatment options for acne vary and are primarily determined on the severity and extent of the problem. Benzoyl peroxide, retinoids, and topical antibiotics are examples of topical treatments for mild acne that can be used either alone or in combination. For moderate acne with deeper cystic lesions or inflammatory papules, an oral antibiotic is often used. The most effective treatment for severe or resistant acne is isotretinoin. Oral contraceptives are also an option for women who suffer from hormonally driven acne outbreaks [11].

1.1.6.Psoriasis

In earlier epochs, leprosy was the most common skin condition linked to stigmatization. Leprosy patients had to wear a bell as a distinguishing symbol and were shunned by society. Many of these individuals were thought to have had psoriasis instead.[12].About 3.2% of people have psoriasis, a prevalent inflammatory immune-mediated condition that affects both adults and children. [13]

1.1.7.Treatment

The treatment of psoriasis can be topical or systemic. treatments, depending on the extent to which the disease is widespread or incapacitating. Among the various potential therapies include coal, topical corticosteroids, calcineurin inhibitors, phototherapy, methotrexate, retinoids, cyclosporine, apremilast, vitamin D analogs, and other biologic medications.

Frequently, a mix of topical, biologic, and systemic medications is needed to manage symptoms and illness.[14,15]

II. VARIOUS BIO-COMPOUNDS USED IN FORMULATION OF HERBAL COLD CREAM

Table no. 1 Various List of Bio- compound used in herbal cold cream

S.no.	Bio-compound	Roles
1.	Hibiscus rosa sinesis	Improving skin tone, reducing hyperpigmentation
2.	Saffron	Skin brightening, reducing dark spots, protecting against damage
3.	Rose oil	Provide soothing effect, antiseptic properties
4.	Aloevera	Moisturizer, potential anti-inflammatory agent
5.	Borax	Act as emulsifier, preservative
6.	Bees wax	Emulsifier , thickener, prevent moisture loss
7.	Methyl paraben	Preservative
8.	Liquid paraffin	Emollient, skin hydrated
9.	Turmeric	Act as a moisturizer, skin brightener & anti-oxidant
10.	Mint	Anti-bacterial, mild analgesic, cooling & soothing
11.	Water	Cooling effect

2.1 Hibiscus rosa sinesis

The Hibiscus plant, often known as the Roselle, belongs to the Malvaceous family. There

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are about 300 species of flowering hibiscus plants, including Hibiscus sabdariffa Linn. It is thought to be a plant with several uses and some health benefits. A perennial, hibiscus blooms all year round. Today, the shrub can be found growing in tropical and subtropical regions including China, India, Sudan, Malaysia, Taiwan, and many more. [Coming from Africa]
16,17]

➢ **Scientific classification of Hibiscus Rosa sinesis[18] :-**

- Kingdom: Planate-Plants
- Subkingdom: Tracheobionta-Vascular plant
- Super division: Spermatophyta-Seed plants
- Division: Magnoliophyta-Flowering plants
- Class: Magnoliopsida-Dicotyledons
- Subclass: Dilleniidae
- Order: Malvales
- Family: Malvaceae-Mallow family
- Genus: Hibiscus L.-Rose mallow
- Species: Hibiscus Rosa sinesis L.-Shoeblack plant
- Chemical constituent: flavonoids, tannin, alkaloids

Figure 3: Hibiscus rosa sinensis

Method of Extraction

i. Maceration

In maceration (for fluid extract), the plant medicine, either whole or coarsely a stoppage container keeps the powder in contact with the solvent for a predetermined amount of time while being agitated frequently to break down any soluble materials. This strategy is effective for thermo-labile medications. [19].

ii. Decoction

The process of decoction involves boiling a crude medicine in water for 15 minutes,letting it cool, straining it, and then running enough cold water through it to get the desired amount.[20] This approach extracts the heat- and water-soluble components from the drug.

- **Possible Applications of Hibiscus for Skin Health :-**

Complex polysaccharides known as mucilage are abundant in hibiscus plants. The plant's leaves have long been used to soothe burning sensations and skin disorders. It may have a soothing and moisturizing impact on the skin. It's possible that hibiscus mucilage extract's glycerine has the greatest skin-moisturizing effect[21].

2.2 Saffron

- Kingdom: Plantae[22]
- Order: Asparagles
- Family: Iridaceae
- Genus: Crocus
- Species: C.sativus
- Chemical constituent: caretonoids, flavonoids[23]

Figure 4: Saffron

✹ **Method of Extraction[24]**

Solvent extraction, sometimes referred to as solid/liquid extraction, is the usual method used to obtain saffron extract, regardless of whether it is meant for culinary or cosmetic purposes.
The flower is supposed to be soaked in supercritical CO2 or another solvent that is either a liquid or a semi-gaseous. Combinations of water and methanol (50–50% or 20–80%) and water and ethanol (20–80%) are the most commonly used liquid solvents. The extraction steps are as follows:

a) **Harvesting of Stigmas**: The dried stigmas of saffron flowers are used to make saffron. The stigmas, or brilliant red parts of the flower, are

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hand-harvested during the short saffron flowering season, which is often in the fall.

b) **Drying of the Stigmas**: The saffron stigmas are meticulously removed from the remainder of the bloom after harvest. To preserve the saffron's properties, they are then dried in specialist dryers or outdoors at a controlled temperature of 95 to 113 degrees Fahrenheit.

c) **Extraction of Active Compounds** : The process of extracting active chemicals starts after the saffron stigmas are dried. For this, a flask containing the pulverized, dried stigmas is filled with a liquid or semi-gaseous solvent. After that, they are left to macerate for a few days so that the active ingredients can dissolve in the solvent.

d) **Purification and Concentration**: To eliminate contaminants and produce a product with a higher concentration of active chemicals, the extracted material is put through a number of purification procedures. Steps such as filtration and decantation are particularly involved. A rotary evaporator is then used to evaporate the solvent at a lower pressure. The solvent being used determines the temperature; for example, ethanol requires a temperature of 40°C.

- **Health benefits[25]**
- Antioxidants like saffron (safranal and croccin) shield the skin from harm brought on by free radicals. Oxidative stress, which is brought on by unstable molecules called free radicals, can result in wrinkles, fine lines, and other aging symptoms..
- As a potent antioxidant, it neutralizes free radicals that can increase the creation of melanin and inhibits the tyrosinase enzyme, which lowers the formation of melanin. The complexion becomes more radiant as a result.

2.3 Rose oil

Cytotoxicity, genotoxicity, effects on bacteria and fungi, fertility, teratogenicity, and memory retention are among Rosa alba L.'s numerous biological properties. Numerous chemical components, including citronellal, geraniol, nerol, linalool, citral, caracole, and eugenol, make up Rosa alba essential oil, which has numerous antimicrobial properties[26].

- **Plant description and taxonomy[26]:-**
- Kingdom: Plantae
- Division: Magnoliophyta
- Class: Magnoliopsida
- Order: Rosales
- Family: Rosaceae
- Genus: Rosa
- Species: Rosa alba L
- Chemical constituents: citronellol,geraniol, linalool[27]

Figure 5: Rose oil

- **Method of Extraction**

a) Steam Distillation[28]

The most common method for extracting essential oils is steam distillation, which Rose oil. It is preferred because it yields highquality, pure oil without the use of chemicals.

Process:

Harvesting: The roses are harvested in the early morning when the petals contain the highest level of aromatic substances

Preparation: Fresh petals are placed in a large distillation still, and steam is passed through them.

Distillation: The heat from the steam causes the cellular walls of the petals to breakdown releasing the aromatic compounds. These compounds are carried along with by transferring the steam into a condenser, where it is cooled and transformed into water.

Separation: The collected liquid, which is now a mixture of oil and water, is condensed. Since Oil floats to the top and is then separated from the because it is less dense than water.The remaining water is known as rosewater, which also has significant uses.

- **Uses of rose oil :-**

It can leave your skin smooth and help you get rid of scars from injuries, boils, acne, and pox. It

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can even aid in the removal of surgical scars, fat fissures, stretch marks, and other flaws. Rose oil's antioxidant qualities are beneficial.
with rapid skin healing [29].

2.4 **Aloe vera[30]**

- Taxonomical position of aloe vera:
- Kingdom: Plantae
- Order: Asparagales
- Division: Spermatophyta
- Subdivision: Spermatophyta
- Class: Monocotyledonous
- Family: Liliaceae
- Genus: Aloe
- Species: barbadensis Mill
- Chemical constituents: Aloins, Barbaloins, Isobarbaloins []

Method of extraction[31]

Aloe vera
⇩
Washing
⇩
Trimming
⇩
Filleting
⇩
Gel extraction by centrifuge
⇩
Crude gel
⇩
Purification
⇩
Vacuum filteration
⇩
Pure gel

- **Benefits**

Aloe vera can be used topically to a scuffed forehead or chin to provide immediate pain and burning sensation relief. Use three times daily. Try aloe vera instead of Neosporin if you're accustomed to using it for minor cuts. Its molecular structure boosts collagen and fights bacteria to speed wound healing and reduce scarring. Apply up to three times per day [32]

Figure 6: Aloevera

2.5 Borax

Numerous creams, gels, and lotions made of cosmetics contain borax and wax. It is frequently utilized in products for washing one's hands to remove dirt and oil. Borax's alkaline qualities make it a perfect ingredient for cleansers and toners. Some cosmetic goods employ borax as an emulsifier, buffer, or preservative in shampoos, lotions, creams, scrubs, bath bombs, and bath salts, among other moisturizing items. Borax is another chemical that is combined with glue and water to make "slime," a sticky material that many children like playing with. From body lotions and creams to shampoos, bath gels, and even the well-known bath bombs, borax is a ubiquitous element in skincare products. Borax is commonly used in a small number of natural cosmetics products because of its mild and antibacterial qualities [33].

Figure 7: Powder of Borax

2.6 Bees wax

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Ability to Guard Against Irritants: Beeswax has the ability to act as a barrier when applied topicallyIt can protect skin from environmental contaminants and severe weather. Promotion of Hair Growth: Beeswax not only hydrates and nourishes hair, but it also keeps moisture from escaping. It is possible for beeswax to create a skin barrier. Because it is a humectant, it also draws water. The skin's capacity to hold onto moisture may be by these two traits. Beeswax is also a natural exfoliator that effectively removes dead skin cells. Beeswax is an antimicrobial that softens and heals skin. It can help with acne, dry skin, stretch marks, and eczema. You can make your own customized moisturizers and skin care products with our raw beeswax [34].

Figure 8: Bees wax

2.7 Methyl paraben
Other Name: Methyl 4-hydroxybenzoate
Molecular formula: C8H8O3
Molecular Weight: 152.12

Figure 9: Methyl paraben

Methyl paraben is a preservative that stops dangerous bacteria from growing. Methyl paraben is one kind of paraben. One kind of preservative that is frequently used to extend the shelf life of products is parabens. To stop mold and other dangerous bacteria from growing, they are applied to food or cosmetics. The components of many products include methyl paraben along with one or two other parabens. Many foods, medications, and cosmetics contain parabens. Parabens may be present in a variety of cosmetics, including moisturizer, hair care, shaving products, and makeup [35].

2.8 Liquid paraffin
Common Name: Petrolatum
Molecular Formula: C15H11ClO7
Molecular Weight (g/mol) 338.696

Figure 10: Liquid paraffin

Because it keeps the skin hydrated, mineral oil, sometimes referred to as liquid paraffin, is crucial for skin maintenance. As a barrier, it prevents moisture from escaping the skin. Cosmetics also employ liquid paraffin. It is an ingredient in many cosmetics, oils, cold creams, moistened creams, detergent creams, and other beauty items. It can be used as an emollient lotion for dry skin. Liquid paraffin is commonly utilized in skin care cream formulations to aid in moisture retention. The interior barrier of the skin keeps moisture in and preserves the health of the skin. Using liquid paraffin could help reduce the symptoms of skin conditions[36].

2.9 Turmeric
used to shield skin from UV rays and fight the symptoms of aging. used to make skin tone more radiant [37].

- Taxonomical position of turmeric[38]
- Kingdom: Plantae
- Division: angiosperm
- Order: Zingiberales
- Family: Zingiuberaceae

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- Genus: Curcuma
- Species: C. longa
- Chemical constituent: curcuminoids, phenolic acid, flavonoids[39]

✹ **Method of extraction[40]**

a. Solvent Extraction Method

To obtain coloring matter, the simplest method is to ground dried turmeric into a powder and then add a solvent. Carbon dioxide, ethanol, methanol, n-butanol, ethyl acetate, hexane, acetone, isopropanol, and methanol dichloromethane are some examples of solvents. Alongside other volatile oils and resinous extracts, an oleoresin with a coloring matter content of approximately 25–35% is formed. A curcumin pigment is subsequently recovered from the oleoresin following many washing with different solvents. The final result is a purified powder with a high coloring matter content and a low volatile oil concentration.

Figure 11: Turmeric Powder

- **Health benefits[41]**
- It can treat injuries
- It can help in psoriasis
- Treat scabies as well.
- It enhances the skin's natural glow

2.10 Mint

The Lamiaceae plant Mentha arvensis L. is commonly known as a pudina. Additionally, mint leaves reduce stressed outbreaks since they contain vitamin A and salicylic acid. Mint cools the skin and has antimicrobial qualities in its leaves [42].

- Taxonomical description of mint[43]
- Kingdom: Plantaea
- Division: Magnoliophyta
- Order: Lamiales
- Family: Lamiaceae
- Subfamily: Nepetoideae
- Genus: Mentha L.
- Species: Mentha spicata L.
- Chemical constituent: Flavonoids, organic acids, quinines[44]

- **Method of extraction[45]**

Mentha Arvensis L.'s newly harvested leaves Were collected from a backyard garden, and after being dried in the sun for seven to eight days, the leaves were ground into a powder and 25 grams of the powder were extracted using the Soxhlet extraction method and methanol (125 milliliters as the solvent). The equipment was always kept warm by a heating mantle. The sample was stored in an extraction thimble. After going through multiple cycles for roughly three to four hours, the extraction process' solvent was collected and concentrated in a thermostatic water bath set at 650 degrees Celsius.

Figure 12: Mint leaves

- **Health benefits[46]**
- Conditions and hydrates the skin
- Reduce dark circles
- Clear blackheads
- Brightens complexion
- Nourishes skin
- Treat acne
- Heal wounds

III. FORMULATION AND EVALUATION OF HERBAL COLD CREAM

- Pour the required amount of liquid paraffin and beeswax into a porcelain dish.
- Heat the ingredients in a water bath until it melts. Remove the plate from the water bath..
- Fill a beaker with borax and distilled water. In a water bath, this solution should be heated to about 750 C.

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- Add methyl paraben and these borax solutions drop by drop in a porcelain dish while swirling constantly.
- Add plants such as hibiscus rosa sinensis, aloevera, saffron, turmeric, mint, and rose oil for aroma. Herbal cold cream was also purchased.

IV. EVALUATION OF HERBAL COLD CREAM:

- **PH:** A digital pH meter was used to measure the pH of various formulations. After being weighed and diluted in 100 milliliters of distilled water, approximately one gram of the cream was stored for two hours. Each formulation's pH was measured three times, and where necessary, the average values were calculated [47].
- **Viscousity:** Using spindle No. 7 on a book field viscometer set to 100 rpm, the cream's viscosity was determined[48].
- **Spreadibility**The number of seconds it took for two slides separated by a particular load to separate from the cream positioned between the slides was used to calculate the spread ability. It takes less time to separate the two slides when there is better spread ability.

Two sets of standard-sized glass slides were taken. The herbal cream formulation was placed on one of the slides. One slide was placed over the formulation, and then the cream was sandwiched between the two slides. By applying weight to the upper slides, the cream was uniformly squeezed to form a thin layer between the two slides. After removing the weight, the formulation that was still adhered to the slides was scraped off. It was able to slide off without any problems because to the force of the weight attached to the upper slide. The duration of the top slide was noted.

Spread ability= m ×l /t

M = weight tied to the upper slide (30g) l =length of glass slide (5cm) t =time taken in sec [49]

- **Patch Test**On the left dorsal surface, mark a location one square centimeter in size. The time was recorded after the cream was applied to the designated area. Any edema, erythema, or irritation was evaluated and reported often for a maximum of 24 hours [50,51]
- **Homogeneity:** The test and visual appearance were used to assess homogeneity**.**
- **Stability Test:** The prepared cream was poured into the glass container with a spatula and secured to the bottom with tape. The bottle was filled two-thirds of the way, and then the plug was put in and the cap was tightened.

The specimen was incubated upright at 4° 1' for 48 hours. The test was successful if, upon removing the sample from the incubator, there is no sign of oil separation or any other phase separation[52]

V. CONCLUSION:

The conclusion drawn from the numerous research h is that people are more receptive to natural medicines since they are thought to be safer and have less negative effects than synthetic ones. As a result, the use of herbs in cosmetics has greatly increased in personal care systems, and demand for herbal cosmetics is high at the moment. Herbal creams that are safe, effective, non-toxic, and use herbal extracts to increase patient compliance would be far more popular than synthetic ones. Cream containing Hibiscus rosa, mint leaves, turmeric powder, aloe vera, and other herbal components had antibacterial properties, and each of these herbal compounds shown notable variations in activity.

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