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Formulation and Evaluation of Herbal Cream (Moisturising + Cold + skin whitening)

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Abstract

Skin is hydrated by a pure herbal moisturizing cream. A mix of herbs designed to improve one's personal appearance is called a herbal cosmetic. Our main objective is to develop a herbal cream with several functions, such moisturizing and reducing acne. Among the many natural elements in the recipe are aloe vera, neem, rose water, turmeric, tulsi, ; each has unique properties that enhance skin health. While neem contains antibacterial and anti-inflammatory qualities, aloe vera is widely known for its relaxing and healing qualities. Rose water is valued for its fragrance and skin-softening properties. These components work together to create a powerful combination that makes the skin feeling smooth and shields it from the elements, attacks in addition to providing moisture. To extract the essential components from the plant material, some extraction is necessary. According to the evaluation study, the formulation of the herbal face pack using easily available natural ingredients, such as neem, is a very good attempt. Also, it was established that the created formulation had the properties of a typical cosmeceutical formulation for skincare and was stable both physico-chemically and microbiologically.

Keywords: Herbal moisturising cream, cosmetics, Extraction, Evaluation studies

Introduction [1-6]

Herbal cosmetics, which use the power of natural plants and herbs, are an important player within the broader cosmetic industry. Based on the principle of improving one's physical appearance while maintaining the body's natural balance, herbal cosmetics are divided into several key areas that attend to a wide range of skincare needs. The use of herbal ingredients in the formulation of cosmetic products has grown greatly in the personal care sector over the past few years, displaying a growing market interest in herbal cosmetics.

Topical drug delivery[7-9]

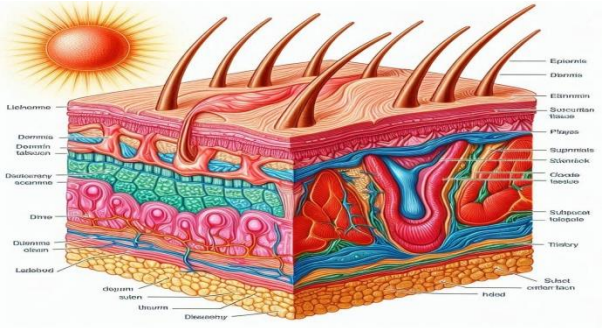
It is practical and simple to utilise
First-pass metabolism is inhibited
A substitute for oral delivery;
A decreased chance of gastrointestinal issues;
A decreased chance in order to treat illnesses, medications have been given to the body in a variety of methods in recent decades, including orally, sublingually, rectal, parenterally, topically, inhaled, etc. Topical administration refers to the application of a drug-containing formulation to the skin in order to treat the symptoms of a common disease or ailment, like psoriasis, that are targeted, including the drug's pharmacological action or activity on the skin's surface or inside the skin. Semi-solid treatments in all of their forms are the most common for topical administration; however, foams, sprays, medicinal powders, solutions, and even medicated toothpastes can be employed.

Advantages of Topical drug delivery:

- Easy to use and convenient
- It is an alternative to oral delivery since it inhibits first-pass metabolism.
- A decreased chance of digestive issues.
- A lower chance of abuse

Basic Structure of a skin[10]

With an area of 1.8 m^2 and a weight of 16% of the body, the skin is the biggest organ in the body. The epidermis, dermis, and subcutaneous tissue are the three structural layers of the skin. Cutaneous glands, sweat glands, sebaceous glands, hair, and nails are all classified as skin derivatives. The outermost layer, known as the epidermis, serves as a chemical and physical barrier between the interior and external bodies. environment; the dermis, which is loose under the connective tissue layer, subcutaneous or hypodermis, is the deeper layer that gives the skin structural support and is a significant fat store.



Epidermis:

The epidermis is the outermost layer of skin, made up of stratified keratinised squamous epithelium. Its thickness varies throughout the body, with the palms and soles of the feet having the thickest layer. The epidermis does not have blood vessels or nerve endings, but its deeper layers are absorbed in the fluid known as interstitial fluid, which provides nutrients and oxygen and drains away as lymph nodes. The epidermis is composed of four layers, which move from the bottom layer to the top:

Basal layer (basal or germinativum cell layer)
Spinal layer (spiny cell layer)
Corneal layer (corneal layer) In the dermis:
The dermis is strong and stretchy. Collagen fibres linked with elastic fibres make up the matrix, which is composed of connective tissue. Excessive stretching of the skin causes rupture in the elastic fibres, which can lead to permanent pressures or strains that can happen during pregnancy and obesity. Wrinkles form when the skin's elastic strength and ability to bind water decrease due to ageing.
The primary cells found in the dermis are mast cells, macrophages, and fibroblasts. There are different quantities of adipose tissue and areolar tissue below this deepest layer.

Subcutaneous Layer: [11]
They come from the same tissue as the follicle where hair grows and are made up of secretory epithelial cells. They release sebum, an oily material that penetrates hair follicles and is present throughout the body with the exception of the palms of the hands and the toes of the feet. They typically show up in the thigh, the underarms, face, and scalp. In regions where one form of superficial epithelium gives way to another, such the oily glands on the lips, eyelids, nipples, labia, and penis, which are separate from hair follicles, release sebum through the stratum granulosum (granular cell layer).

Function of the skin:
1. **Protection:-** Acts as a barrier against physical injuries, harmful microorganism, UV radiation, and harmful chemicals.
2. **Regulation of Body Temperature:-** Helps maintain body temperature through sweating and blood vessel dilation or constriction.
3. **Sensation:-** Contains nerve endings that detect touch, pain, pressure, and temperature changes.
4. **Excretion:-** Eliminates waste products like urea and salts through sweat.
5. **Vitamin D Synthesis:-** Produces vitamin D when exposed to sunlight, which is essential for calcium absorption.
6. **Water Retention:-** Prevents excessive water loss and helps maintain hydration levels.
7. **Immune Defense:-** Contains immune cells that help detect and fight infections.
8. **Storage:-** Stores fats, water, and essential nutrients.

Cream: [12-14]
Ointments are topical medications that can be used to the skin; they are defined as "thick liquid" or partially solid emulsions, which are either water-in-oil or oil-in-water dosage forms, with varying combinations of water and oil; creams are utilised for cosmetic purposes, such as washing, enhancing, improving looks, protecting, or for therapeutic action; these immediate preparations are used to achieve a local effect of the drug into the skin or submucous layer; they are designed to be used externally, in order to better apply the drug to the skin in a site specific manner in the cure of skin diseases.

The creams are regarded as pharmaceutical products because they are made with techniques developed in the pharmaceutical industry in 2010. Both medicated and non-medicated creams are used to treat diseases or skin conditions, and they can be ayurvedic, herbal, or allopathic. Creams can be classified as o/w or w/o type emulsions based on the stages. The term "cream" has historically been used to refer to a semi-solid substance ready either as water in oil (e.g., cold cream) or as oil in water (e.g., disappearing cream).

Cream Types: [15-17]

They are separated into two categories:

Oil in water (O/W): creams constituted of small oil droplets spread in a continuous phase, and an emulsion in which the oil is spread in the form of drops through the water phase is called oil in- water (O/W) emulsion.

Water in Oil (W/O): Creams made of tiny water droplets scattered over an oily substance step by step The emulsion is of the water-in-oil (W/O) type if the dispersion medium is oil and the dispersed phase is water.

Classification of Creams:

Lubricants according to function, characteristics and kind of emulsion:

1. Foundation (oil/water emulsion):
- fading creams.
- Foundation creams.
2. Cleansing cream, cleansing milk, cleansing cream (without emulsion)
3. Winter cream (without emulsion): Cold cream or moisturizing creams..
4. General creams and general creams.
5. Night cream and massage creams.
6. Skin protection cream.
7. Hand and body creams.

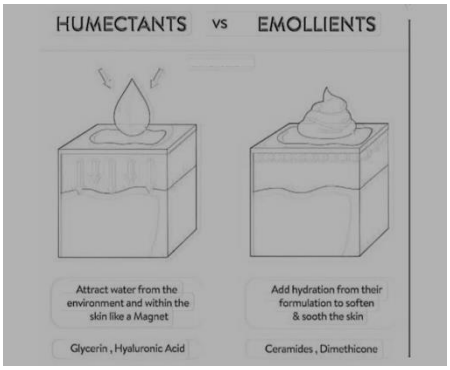
Moisturizing Cream [18-21]

A skincare item called moisturiser is used to protect, lubricate, and moisturise skin. Sebum produced by healthy skin typically performs these tasks. The word "to soften" comes from the Latin verb "mollire," which means "to soften." Transepidermal water loss (TEWL) is the process by which water continuously evaporates from the deep layers of the skin in the human body. By controlling its because of its high water content, human skin keeps its surface naturally dry and smooth, keeping off infections, debris, and

damage while shielding the body from degeneration. stiff and brittle. The lipid bilayer that separates the corneocytes determines the capacity to hold to moisture. The active components in humidifiers come into one of the categories of substances that alter the pace at which water evaporates. into two groups: humectants and occlusive substances.

Mechanism of Moisturizing Cream:

Transepidermal fluid loss is the term for the continuous evaporation of water from the human body's deeper layers of skin. By controlling how much water it contains, human skin naturally keeps its surface dry and easily removed while functioning as a barrier against viruses, debris, or injury. It also prevents itself from drying out and becoming soft and rigid. The dual layer of lipids that separates corneocytes determines their capacity to hold onto moisture. The active ingredients in moisturisers, which can be classified as either occlusives or humectants, change the rate at which water is lost. On the surface of the skin, occlusives form a barrier that stops moisture from leaving. The stronger the formulation, the more occlusive it is. impact. Compared to aqueous moisturisers, which are more occlusive than lotion, ointments are more occlusive. The usual rate of water loss via the skin is 4–8 g/(m²-h). On healthy skin, petroleum jelly can reduce that loss by 50–75% for a few hours. The same mechanism is used by the body to naturally create oils that moisturise. Humectants absorb wetness. They may soak up this water from the atmosphere and moisturise the skin when the humidity is higher than 70%, but more they often cause the skin to dry out by draining water from the dermis into the epidermis. A typical component in moisturisers, water acts as a short-term hydrator as well as a medium for absorbing of certain chemicals and the moisturizer's evaporation.



Advantages of Moisturizing Cream:

1. Herbal moisturisers have the primary benefit of improving skin dryness without causing any negative side effects.
2. It lessens the likelihood of future skin issues.
3. This hydrator aids in the battle against wrinkles.
4. Not as oily as some other ointments
5. Keeping your skin moisturised keeps it youthful.
6. Compared to synthetic cosmetics, they are highly effective when used in modest quantities.

Cold Cream: [22-26]

The water in oil emulsion is known as cold cream. Compared to other semisolid dosage forms or formulations, cold cream provides a longer contact time at the place of use site. They make the skin look

smoother and less oily. The oil phase causes it to provides the skin with emollience. The purpose of the cold cream is to cool the body, release waste products from the pores, and restore moisture in dry skin. It is simple to clean, wash, and remove with simplicity. When applied to the skin, they don't cause irritation.

Cold Cream Benefits: [23,27]

The advantages of cold cream are fairly simple. Anyone who wants to increase their skin's hydration can use cold cream because it is designed to moisturise the skin topically. But individuals with dry, itchy skin or extremely sensitive skin would get greatest benefit from using it every day to enhance the texture and the way their skin looks. These effects most likely originate from the cold cream's capacity to assist the skin regain its natural barrier function against the environment, which is compromised by excessive dryness.

Ingredients Used in Our Cream

1. **Aloe Vera**[28,29]

Synonyms - Aloe, Musabbar, Kumari.
Family –Liliaceae.
Biologicalsource: aloes are dried juice obtained by transversely cut Leaves of various species of .
Aloebarbadense Miller. .
Aloe perryi Baker.
Aloe spicata Baker
and Aloe Africana Miller.
Chemical constituents: - Anthracene glycosides, Barbaloin, Isobarbaloin, aloe-emodin and aloesone.Resins Also contains Aloetic acid, homonataloin etc.
Uses: - Purgative,

- Laxative,
- Used for Ulcers and burns,
- Aloe found many Uses in cosmetics nowadays like, Hair conditioner,
- Hand and body lotion,

2. Neem plant Leaves[30]

Synonyms: –Neem, Nimtree, Margosa.
Family: –Meliaceae.
Biological source: –It is consisting of Leavesand other aerial parts of Azadirachtaindica.
Chemical constituents: –Azadirachtan, Nimbin,Nimbidin,Nimbidol,Salannin ,Quercetin , etc.
Uses: –anti inflammatory

- fungal
- anti-bacterial
- antiarthritic
- anti antipyretic

3. Rose water

Synonyms – Velvet petal, Floral petal, Silken petal, rosette fragment, Floral segment.
Family- Rosaceae
Biological Source – It is obtained from the Rosa species,
Rosa damascene
Rosa centifolia
Rosa gallica
Rosa indica
Chemical constituents- It contains essential oils (geraniol, Nerol, Eugenol, linalool) , Flavonoids (Myricetin, Quercetin, Kaemferol), Tannins (Gallic acid, Ellagic acid), Polysaccharides (Pectins, Mucilage)
Uses- Hydrates and refreshes skin

- Soothes irritation and redness,
- Anti-aging benefits
- Natural cleanser and astringent

4. Borax Powder[30]

In cosmetic products, borax is sometimes used as an emulsifier, buffering agent, or preserving agent for nourishing products, creams, shampoos, gels, lotions, bath bombs, scrubs, and bath salts. It is also used in hand soaps to help remove oil or grease from the hands, and its alkaline nature makes it an ideal ingredient in cleaners and toners. Borax is often combined with wax to make these cosmetic products.

5. Turmeric[31]

Family- Zingiberaceae
Biological Source- It is obtained from the Curcuma longa
Chemical constituents- It contains Curcuminoids (3-5%), Essential Oils (volatile oils) i.e. Turmerone, Ar-turmerone, Zingiberene, Polysaccarides i.e. ukons Proteins , resins, and starch.
Roles:

- Anti-inflammatory
- Anti-oxidant
- Anti-microbial
- Anti-ageing

6. Tulsi leaves[31,32]

Family – Lamiaceae
Biological Source – It is obtained from the Ocimum sanctum also known as Ocimum tenuiflorum.
Chemical constituents – It contains
Essential Oils (Eugenol, linalool, camphor, Germacrene)
Flavonoids (Luteolin, Apigenin, Orientin, Vicenin)
Phenolic Compounds (Rosmarinic acid, Caffeic acid)

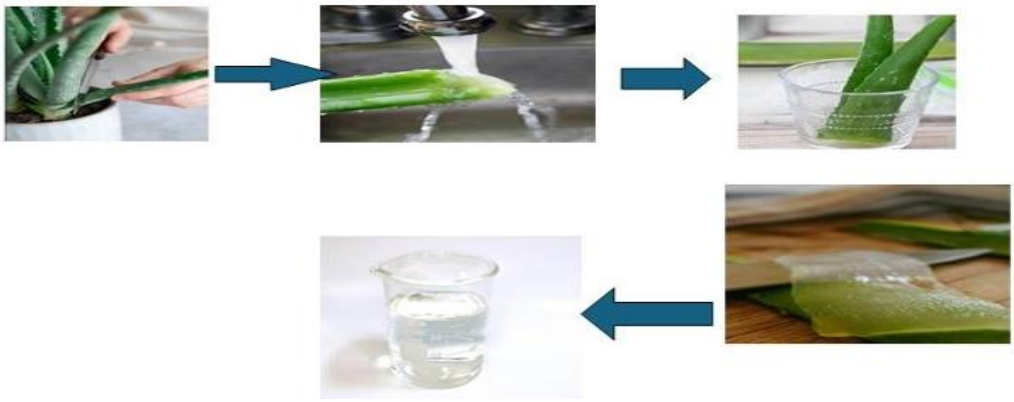
Alkaloids and Tannins (Ocimarin, Ursolic acid)
Terpenoids (Oleanolic acid, Ursolic acid)

Uses-

- Natural immunity booster
- Good for skin health
- Fight acne
- Helping anti-aging

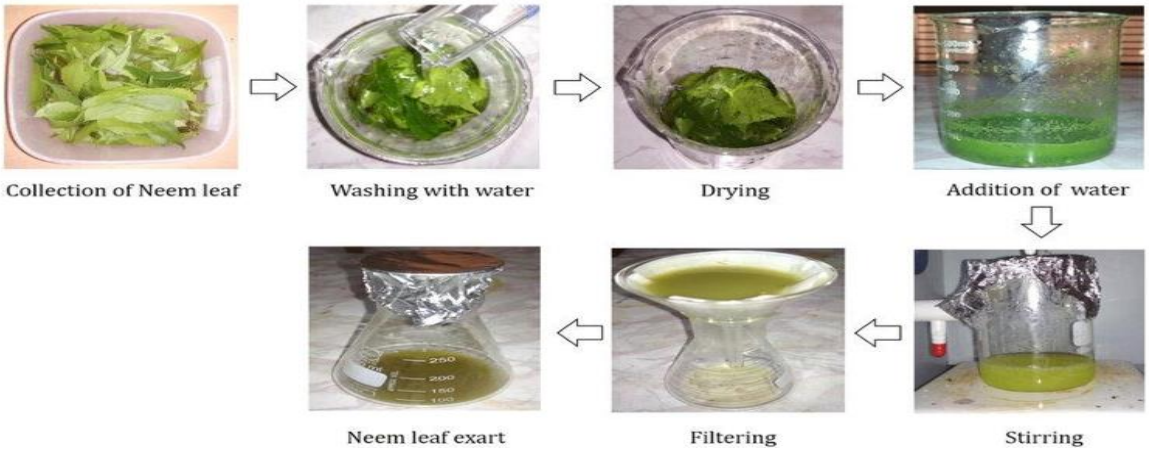
Methods and Material

Extraction of Aloe-vera[28,29]



Choose a thick, healthy aloe vera leaf from the outer section of the plant. These leaves tend to contain more gel. use a sharp knife to cut the leaf off at the base. Rinse the leaf under cool water to remove any dirt or debris.place the leaf cut-side down in a container and let it drain for about few minutes to allow the yellow resin (aloin) to drip out. this discharge contains latex, which may cause allergic reactions in some people.Once drained, lay the leaf flat on a cutting board. Use the knife to cut off the spiky edges on both sides of the leaf.Carefully slice through the top layer of skin lengthwise from one end of the leaf to the other. Open the leaf to expose the gel inside. scoop out the clear gel from inside the leaf. for a smoother consistency, you can place the gel in a blender and blend for few seconds.

Extraction Of Neem Leaves[30]



Take a neem leaves and dry them in an oven at 50 C until they are completely dry grind the dried leaves into a fine powder.mix the powdered leaves in a ratio 1;2. heat the mixture to 60-70C which is a safe

temperature range that allows for efficient extraction without damaging the active compounds. Maintain this temperature and stir the mixture continuously for about 30 to 60 minutes. After heating, strain the mixture through a Waltmanfilter to separate the liquid extract from the solid residue. Store the liquid extract in a clean airtight container.

Formulation of Herbal Cream

Sr. No.	Ingredients	F1	F2	F3	Uses
1	Aloe vera Gel	6 gm	14 gm	14 gm	Moisturizing agent
2	Neem extract	8 ml	5ml	5 ml	Antiseptic, Antiacne
3	Powder borax	4 gm	4 gm	4 gm	Alkaline agent
4	Turmeric	5 gm	6 gm	6 gm	Anti-ageing, antimicrobial
5	Rose water	6 ml	6ml	6ml	Cleansing property
6	Tulsi leaves extract	5 ml	7 ml	7 ml	Fight acne , Skin tightening and whitening
7	Distilled water	Q.S.	Q.S	Q.S	Vehicle

Evaluation Parameters[33.34]

a. **Physical evaluation**: It is mainly used for cream color, smell, texture and stability
b. **Viscosity**: Basically, the purpose of this test is to determine how the cream ingredients work behave in real life. Its main purpose is to estimate power.
c. **Washability:** This method also tests the quality of the cream. Here is our first and foremost add a small amount of lotion that was used on the hands. Then we have to wash with tap water after that.
d. **Irritancy**: the cream was applied to the surface of the back of the left hand for 1 square cm and observed at equal intervals up to 24 hours for irritation, redness and swelling. Did not cause irritation or redness of the skin.
e. **Spreadability**: The lubricity test showed that the prepared cream has good lubricity property
f. **Greasiness**: This test is mostly used to determine whether a cream is greasy or oily in nature. U.S from the results it can be concluded that none of the formulations were greasy.
g. **pH test**: Basically we are talking about how acidic different compounds are. pH (cream)) the range is often between 4 and 7. Either a digital pH meter or pH paper was used for measurement the results of this test.
h. **Phase Separation**: This test is usually checked every 24-30 hours. That's what cream should be for heated to 30-80 °C in a covered container. Keep this mixture away from light.

Conclusion:

Herbs such as tulsi aids to enhance immunity naturally, neem promotes wound healing, and rose water reduces wrinkles and removes dead skin cells. Turmeric was found to exhibit anti aging and antioxidant properties. Aloe-vera extract are excellent moisturizers and increase skin hydration. Because it was created with simple ingredients and methods, the cream is affordable.

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