

Formulation and Evaluation of Herbal Moisturizer

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Abstract:

Herbalism or Botanical medicine is generally used to describe Herbal Medicine, is the use of herbs for their therapeutic or medicinal value. The herb is a plant or plant part valued for its medicinal, aromatic qualities. Herbal cosmetics are the preparations used to improve the individual appearance. The aim of the present research study was to formulate the herbal moisturizer using different herbal plants such as Aloe vera, Cucumber, Neem along with glycerin, coconut oil, rose water, vitamin E, vitamin C and evaluate for its efficacy by physical appearance, pH, spreadability, Greasiness, irritancy, etc. for moistening, nourishing and cure of various diseases of the skin. Compared to synthetic creams, herbal creams provide several benefits. The majority of currently available moisturizers provide more benefits and are made from medications of synthetic origin, but they also have several undesirable side effects, including irritation and allergic reactions. These adverse effects are not present in herbal moisturizing creams, which nourish the skin without them. The only motive behind to choose the mixture of herbal product was to bring true upon the effectiveness of these formulation without any side-effects. According to the study gives the satisfied results.

Keywords: Herbal moisturizer, Medicinal Herbs, Medicinal Herbs, Hydration.

1. Introduction:

The use of herbs in cosmeceutical production has greatly risen in recent years in the personal care system, and there is a high demand for herbal cosmetics. Herbal products in cosmetics or in herbs in cosmetics can also be referred as botanical origin products in cosmetics. Cosmetics are substances that are applied to the human body with the purpose of cleansing, beautifying, increasing attractiveness, and changing appearance without harming the body's structure or functions. The herbal cosmetics can be grouped in to following major categories.

1. For enhancing the appearance of the facial skin.
2. For hair growth and care.
3. For skin care, especially in teenager (acne, pimples, sustaining)
4. Shampoos, soap, powder and perfumery etc.
5. Miscellaneous products.

Among the above mentioned categories, skin care will dominate cosmetically demand in the coming years especially for the professional products used for appearance enhancing facial implants. Cosmetics like creams, gels, and colognes are used on a daily basis by both women and men. Creams act as a cleanser

for the face in many circumstances. Treatment with moisturizer aims at maintaining skin integrity and well-being by providing a healthy appearance of the individual.

Moisturizer:

A moisturizer is a cosmetic preparation used for protecting, moisturizing, and lubricating the skin and moisturizer is a liquid that is used for softening the skin, especially for naturally dry skins. They increase the skin's water content by reducing evaporation. Moisturizers are designed to either impart or restore hydration. There are variety of moisturizer available in market. most of the available moisturizers use synthetic adhesives, emulsifiers, perfuming agents, pigments, surfactants and thickeners to form the base. There is extensive need to replace toxic synthetic agent by using natural herbs.

Ideal characteristics of moisturizer:

It should not be irritating and poisonous.

It should be non-inflammatory and non allergic.

It should be easy to spread over the skin and give pleasant feeling during application.

It should able to leave the skin feeling soft rather than sticky.

It should reduce dryness and improve dull appearance of skin.

Mechanism of Action of moisturizer:

Water regularly evaporates from the deeper layers of the skin of the human body, a phenomenon known as transepidermal water loss.

Human skin naturally maintains a dry, easily shed surface as a barrier against viruses, debris, or harm by managing its water content, while also keeping itself from drying out and becoming brittle and inflexible. The ability of corneocytes to retain moisture is determined by the lipid bilayer that exists between them.

Moisturisers alter the rate of water loss, with active substances falling into one of two categories: occlusives and humectants.

- Occlusives generate a layer on the skin's surface that prevents moisture from escaping. The more occlusive the formulation, the stronger the effect. Ointments are more occlusive than aqueous creams, which are more occlusive than lotion. Water loss through the skin is normally about 4-8 g/(m²-h). Petrolatum can minimise that loss by 50-75% for several hours when applied to normal skin. The human body naturally produces oils that moisturize using the same process.
- Humectants take up moisture. When the humidity is above 70%, they can absorb this water from the air and moisturise the skin, but more frequently, they suck water from the dermis into the epidermis, drying up the skin. Water is a common ingredient in moisturizers, serving as both a brief hydrating agent and a conduit for the absorption of some ingredients and the evaporation of the moisturizer.

Advantages:

1. The main advantage of herbal moisturizer is that it enhances the Skin Dryness without any side effects.
2. It reduces the further chances of skin problems.
3. This moisturizer helps to fight wrinkles.
4. Less greasy compared to other ointments

5. Moisturizing help your skin stay young.
6. With small quantity they are very effective as compared to synthetic cosmetics.

Disadvantages:

1. Herbal drugs have slower effects as compare to Allopathic dosages form Also it requires long term therapy.
2. Manufacturing process are time consuming and complicated.
3. Most of herbal drugs are not easily available.
4. They are difficult to hide taste and odor.
5. Less stable as compare to ointment.

Topical Drug Delivery:

Drugs have been administered to the human body by a variety of routes throughout the past few decades, including oral, sublingual, rectal, parental, topical, inhalation, etc., to cure illnesses.

Topical delivery is the application of a drug-containing formulation to the skin to treat a cutaneous disorder or the cutaneous manifestations of a general disease (such as psoriasis), with the goal of containing the pharmacological or the effect of the drug to the surface of the skin or within the skin.

Semisolid formulations in all their variety predominate the system for topical delivery, but foams, spray, medicated powders, solutions, and even medicated toothpaste can also be used

Benefits Of Using Topical Drug Delivery:

- ❖ Convenient and simple to use.
- ❖ Prevent first pass metabolism.
- ❖ Alternative to oral administration.
- ❖ Fewer risk for gastrointestinal difficulties.
- ❖ Fewer risk of abuse.

Basic Structure Human Skin:

The skin is the largest organ of the body, making up 16% of bodyweight, with a surface area of 1.8m². There are three structural layers to the skin: the epidermis, the dermis and subcutis. Hair, nails, sebaceous, sweat and apocrine glands are regarded as derivatives of skin. The epidermis is the outer layer, serving as the physical and chemical barrier between the interior body and exterior environment; the dermis is the deeper layer providing the structural support of the skin, below which is a loose connective tissue layer, the subcutis or hypodermis which is an important depot of fat.

Epidermis:

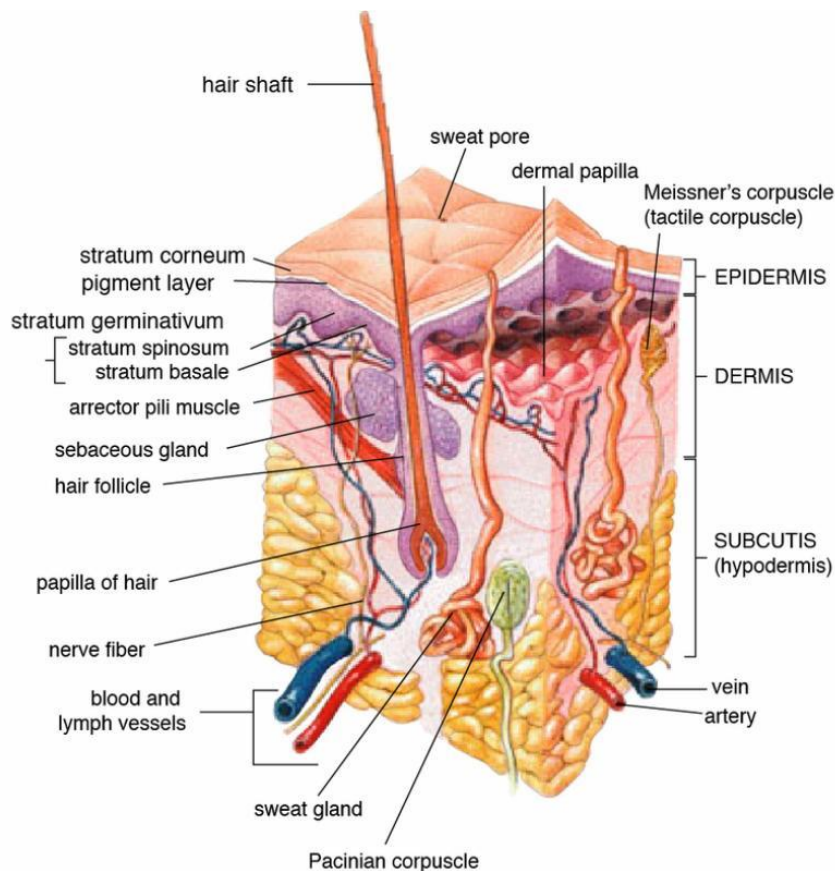
The epidermis is the skin's most superficial layer, made up of stratified keratinized squamous epithelium that varies in thickness across the body. It is thickest on the palms of the hands and the soles of the feet. The epidermis lacks blood vessels and nerve endings, but its deeper layers are soaked in interstitial fluid from the dermis, which gives oxygen and nutrients and drains away as lymph. Moving from the lower layer upward to surface ,the four layer of epidermis are:

Stratum basale (basal or germinativum cell layer)

Stratum spinosum (spinous or prickle cell layer)

Stratum granulosum (granular cell layer)

Stratum corneum (horny layer)



Cross section of skin

Dermis:

The dermis is tough and elastic layer varies in thickness, ranging from 0.6 mm on the eyelids to 3 mm on the back, palms and soles. It is found below the epidermis and is composed of a tough, supportive cell matrix. Two layers comprise the dermis:

A thin papillary layer

A thicker reticular layer

The dermis is made up of fibroblasts, which produce collagen, elastin and structural proteoglycans, together with immune competent mast cells and macrophages. Collagen fibres make up 70% of the dermis, giving it strength and toughness. Elastin maintains normal elasticity and flexibility while proteoglycans provide viscosity and hydration. fibroblast, macrophages and mast cells are the cells found in dermis.

Subcutis (Hypodermis):

This is made up of loose connective tissue and fat, which can be up to 3 cm thick on the abdomen. It protects the body from external trauma and insulates from cold. It acts as a main storage site for fat and therefore energy. There are many blood and lymphatic vessels and nerves passing through the subcutis.

Functions of skin:

- Prevents loss of moisture.
- Provides a protective barrier against mechanical, thermal and physical injury and hazardous substances.
- Protection against infection and chemicals.

- Protection against Ultraviolet radiations.
- Maintaining regular body temperature
- Receiving stimuli from outside world.
- Absorption and excretion.
- Nutrients and water storage.

2. Material and Methodology:

Collection of Herbs: The Herbs including Aloe vera, Neem, Cucumber were collected from garden of my house. Moisturizing agent delivers smoothing property to the skin. Auxin and gibberellins are two hormones found in aloe vera gel. These two hormones have anti-inflammatory effects that lessen skin irritation and promote wound healing. Psoriasis, acne, and eczema are just a few of the chronic skin conditions that aloe is used to effectively treat.

Aloe Vera –

The Aloe vera plant has been known and used for centuries for its health, beauty, medicinal and skin care properties. It is also known as miracle plant. Today, the Aloe vera plant has been used for various purposes in dermatology such as treatment of acne, glowing skin, hydrate the skin, etc.

Synonyms: Aloe, Musabbar, Kumari.

Biological source: Aloes are the dried juice obtained by transversely cut leaves of various species of

- *Aloe barbedensis* Miller,
- *Aloe perryi* Baker,
- *Aloe spicata* Baker and *Aloe Africana* Miller.

Family: Liliaceae

Chemical constituents: Anthracene glycosides (11 to 4), Barbaloin, Isobarbaloin, aloe-emodin and aloesone. Resins (resinotannol + cinnamic acid or coumaric acid). 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, Moisture base cleanser, Shampoo and facewash

Cucumber:

Cucumber are great for dehydrated skin due to its hydrating properties and oily skin due to its astringent properties. They are also suitable for sensitive or irritated skin. Fresh cucumbers can be used directly on your skin to tighten it. Cucumber extract is anti-inflammatory and soothes skin. It may also help with dark circles and puffiness around the eyes. Rich in minerals like potassium, it may help firm skin which can help reduce some of the signs of aging.

Synonym: cucumber, Khira

Biological source: it is fruit which is obtained from plant *cucumissativus*.

Family: cucurbitaceae

Chemical constituents: water (95%) and small amounts of protein (0.6%), lipids (0.1%) and carbohydrates (2.2%).



Uses: Hydration, Cancer removal, Bad breath problem, Arthritis and gout pain, Diabetics and hypertension, Weight loss, Hair and nail growth.

Neem:

The use of neem as a medicinal herb is fairly common. Because of their antibacterial, anti-inflammatory, antioxidant, and therapeutic characteristics, neem leaves and their extracts are frequently utilised. Fatty acids, vitamins, and minerals that are essential for good skin and hair are abundant in this wonderful herb. It contains medicinally effective active ingredients including nimbidin, nimbolide, and azadirachtin that can help you treat any skin and hair issues.

Synonym: Neem, Nimtree, Margosa,

Biological sources: It is consist of Leaves and other aerial parts of *Azadirachta indica*.

Family: Meliaceae

Chemical constituents: Azadirachtan, Nimbin, Nimbidin, Nimbidol, Salannin, Quercetin, etc.

Uses: anti fungal, anti bacterial, anti-inflammatory, antiarthritic, antipyretic, hypoglycemic, antigastric ulcer, and antitumouractivities, etc.



➤ Extraction of Aloe Gera :

- Aloe vera leaves must first be collected from a botanical garden, cleaned with distilled water.
- Then the outer portion of the leaf must be chopped longitudinally with a knife.
- Then, we took out colourless parenchymatous tissue and placed it in a 400 ml beaker.
- Next, using a stirrer mixer, we must stir the aloe vera gel.
- After that, it was filtered to remove various contaminants using muslin cloth.
- Finally, cover the beaker with filter paper or silver foil to protect it from microbial development and other environmental effects.

➤ Extraction of Cucumber with Glycerin :

- Firstly take a fresh cucumber and washed it .
- prepare the cucumber by peeling it and slicing it.
- After sliced the cucumber, it can further cut it into smaller pieces that fit well into the container which is use for the extraction process.
- Take a clean glass jar and Add the cucumber pieces to the jar ,cover them with weigh amount of glycerin.
- Cover the jar with silver foil paper and set it aside for a few days.
- After a few days, there more significant changes in the appearance of the cucumber pieces. At this point, you can strain them out.

- Strain the extract by pouring the cucumber mixture through a sieve into a clean jar below. Again, it's helpful to weigh out the final amount of extract. You can then compare to the original amount of glycerin added to know how much cucumber juice has been infused into the glycerin.
- Store the cucumber – glycerin extract by covering the jar.

➤ **Extraction of Neem :**

- Fresh neem leaves were weighed, sterilized (1% sodium hypochlorite), and were washed thrice with sterile distilled water.
- Leaves were ground in mortar and mixed with 10 mL sterile distilled water. The mixture was allowed to stand for 4 hours .
- the homogenate was filtered with Whatman filter paper .Filtrate was plated on nutrient agar to check its sterility.
- If minimum inhibitory concentration (MIC) showing no growth of microbes then use it for further experiment.

Methodology:

1. The moisturizer was prepared by using Aloe vera , Cucumber , Neem , Glycerin , coconut oil , Rose water , Vitamin E capsule , Vitamin C tablet, etc.
2. Different slab techniques and methods were used to mix all different kinds of excipients, particularly herbal extracts.
3. By using extraction, we filtrate pure gel of Aloe vera from Aloe vera leaves and by using slab techniques we developed three different batches of our herbal cream.
4. The various types of batches designed as F1, F2, & F3.
5. The formulation as well as evaluation for each batch done separately.
6. By using parameters like pH, Viscosity, Irritancy, Phase separation etc. we evaluated all formulations of herbal cream.

3.Formulation Development:

1. In order to create a herbal cream, we must first gather various glassware items, such as beakers, spatulas, measuring cups, petri dishes, or other tools, such as stirrers and mixers.
2. After that we have to extract pure Aloe vera gel from leaves of Aloe barbadensis miller.
3. Take 10 min distilled water in a beaker and placed into the water bath. When water is start to warm, add agar agar into it until completely dissolve. after which three separate formulations, designated F1, F2, and F3, must be made.
4. For F1, we used 30 ml of aloe vera gel, 10 ml of cucumber-glycerin extract , 1 ml of Neem extract , 10 ml of agar agar solution, 1ml coconut oil , 2ml Rose water, 1 capsule of vitamin E, 2 tablets of vitamin C.
5. For F2, we used 25 ml of aloe vera gel, 15 ml of cucumber-glycerin extract , 2 ml of Neem extract , 10 ml of agar agar solution, 1ml coconut oil , 2ml Rose water, 1 capsule of vitamin E, 2 tablets of vitamin C.
6. For F3, we used 20 ml of aloe vera gel, 20 ml of cucumber-glycerin extract , 1 ml of Neem extract , 10 ml of agar agar solution, 1ml coconut oil , 2ml Rose water, 1 capsule of vitamin E, 2 tablets of vitamin C.

7.

Sr. No.	Ingredients	F1	F2	F3
1	Aloe vera gel	30 ml	25 ml	20 ml
2	Cucumber + glycerin extract	10 ml	15 ml	20
3	Neem extract	1 ml	2 ml	1 ml
4	Agar agar solution	10 ml	10 ml	10 ml
5	Coconut oil	1ml	1 ml	1 ml
6	Rose water	2 ml	2 ml	2 ml
7	Vitamin E capsule	1 capsule	1capsule	1 capsule
8	Vitamin C tablet	2 tablet	2 tablet	2 tablet

Formulation table:

4.Evaluation Test For Moisturizer:

- Physical evaluation:** This mostly serves to evaluate the cream's colour, odour, texture, and stability.
- Viscosity:** Basically, the purpose of this test is to determine how the ingredients in cream will behave in real life. Its primary purpose is to evaluate efficacy.
- Washability:** The quality of cream is also tested using this method. In this first of all we have to add small amount of cream which was applied on the hand. We must then wash with tap water after that.
- Irritancy:** The cream was applied on left hand dorsal side surface of 1 sq.cm and observed in equal intervals up to 24hrs for irritancy, redness and edema. The did not produce any irritation or redness on skin.
- Spreadability:** The spread ability test showed that the formulated cream has good spreadable property.
- Greasiness:** This test is mostly used to determine whether cream is greasy or oily in nature. We can conclude from the results that none of the formulations were greasy.
- pH test:** Basically, this is talking about how acidic different compounds are. The pH (cream)) range is often between 4 and 7. Either a digital pH metre or pH paper was used to measure the results of this test.
- Phase separation:** Generally, this test is checked every 24 to 30 hours. For this, cream must be heated to between 30 and 80 °C in a covered container. Keep this mixture out of the light.

5.Resultand Observations:

After formulation and evaluation of herbal moisturizing cream, we observed following various types of results –

1.Result of physical evaluation:

Sr.no.	Parameters	F1	F2	F3
1	Colour	Yellowish	Yellowish	Yellowish
2	Odour	Organic	Organic	Organic
3	Texture	Smooth	Smooth	Smooth
4	State	Semisolid	Semisolid	Semisolid

2. Result of Irritancy, pH, Phase Separation:

Sr.No.	Formulations	Irritancy	pH	Phase Separation
1	F1	Nil	6.7	No phase separation
2	F2	Nil	5.2	No phase separation
3	F3	Nil	5.6	Phase separation

3. Result of washability ,Greasiness, spreadability:

Sr.no.	Formulations	Washability (seconds)	Greasiness	Spreadability
1	F1	8	No greasy	Spreadable
2	F2	9	No greasy	Spreadable
3	F3	12	Slightly greasy	Spreadable

6.Discussion:

When various evaluation criteria were applied to created moisturizer compositions, the findings fell within the parameters indicated in the previous result. All of the formulations had a smooth texture and a yellowish colour. The pH of the formulation varied from 5.2 to 6.7. The formula's washability varies from 8 to 12 seconds, as does its viscosity. The formulations are proven to be less oily and to not irritate skin .

7.Summary and Conclusion :

Formulation and Evaluation of Herbal Moisturizer by using herbal ingredients was successfully developed that met the relevant pharmaceutical characteristics. Aloe vera and cucumber were therefore investigated based on the study's findings for its ability to moisturise skin while also reducing skin pigmentation.It was determined that Aloe vera and cucumber extract boost skin moisture and work well as skin moisturisers. The cream is inexpensive since it was made with basic components and simple procedures. Based on the findings, we conclude that all three formulations F1,F2 and F3, are stable, effective, non-toxic, and suitable for use on skin.

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