

Formulation And Evaluation Of Herbal Moisturizing Cream

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Abstract - Moisturizing cream are semi solids preparation used for reduces the chances of skin problems and fights wrinkles. The main aim of the reaserch work is to prepare the moisturizing creams using different herbs and the prepared moisturizing cream are evaluated for the efficacy. The herbs used in the preparations are dried bael leaves powder, amla powder, neem powder, turmeric. The formulated moisturizing creams are evaluated for the various irritancy, wash ability, pH, viscosity, phase separation, spread ability, compatibility test. The results shown that all formulation gave satisfied results.

Key Words: Herbal cosmetics, amla, neem, beael leave, turmeric.

1. INTRODUCTION (Size 11 , cambria font)

The term 'Cosmetic' is a word derived from a Greek word – 'kosmestikos' that is used to adorn. From then any materials used in beautification or promoting appearance is termed cosmetic. The term "cosmetics" actually has its origin in its use in Ancient Rome. They were usually prepared by female slaves known as "cosmetae" which is where the term "cosmetics" originated. Cosmetics are used to ornament the appearance. Makeup has been in existence for centuries. The first people to put on makeup for beauty reasons were the Egyptians. In those times, makeup just consisted of eye coloring or some material on the body. (1) Makeup nowadays plays a significant part of both men and women lives. Usage of cosmetics increased rapidly because most people wish to be young and good-looking. Cosmetics have been available in the form of creams, lipstick, perfumes, eyeshadows, nail polishes, hair sprays, etc. Other cosmetics like face powder make the skin glow after applying the base cream. Lipsticks, then again, are widely used by many women of all ages. They are waxed and cocoa butter in the desired amount. Cream, gel, and cologne are everyday products used by women and men.

In many places, creams work as a remover on the face. Not many ages ago, ant age creams were produced; that can maintain the look of you younger skin for many ages. The best cleaning product is cleaning cream, soap, and water. These cosmetic creams are a good source of nutrition for really tough, dry, or chapped skin. Simplicity can be said like this: it just oils, softens, and clears the unwanted dirt off the skin. Some of the common oils used include Vaseline and Lanolin. Thick creams are used in soap and gelatin which is a base of the skin. An important balance between water content in the stratum corneum and skin surface lipids maintains the appearance as well as the function of the skin. The most superficial layer of the body represents the skin, and so this tissue is constantly exposed to a variety of environmental stimuli. External factors as well as endogenous factors may disrupt such balance. (2) In addition, the same repeated use of soaps, detergents and topical irritants like alcohol and hot water can strip off the skin surface lipids. The disturbance of the skin barrier caused the different types of skin problems. Among them, the most common condition is the loss of water content that leads to dryness of the skin, as well as roughness, scaling, cracks, redness, and an uncomfortable feeling of tightness, which sometimes may be accompanied with itching and stinging.

This keeps the integrities of skin as well as its health intact and allows it to look wholesome because of the application of the product.

While thousands of such products are marketed as natural, safe, organic, herbal, the basic properties of humectancy, occlusivity, and emolliency are about the same for all moisturizers.

Most of the marketed moisturizers use synthetic adhesives, emulsifiers, perfuming agents, pigments, surfactants, and thickeners to form the base. There is a vast necessity to replace the toxic synthetic agent from the base with the help of natural agents.

1.1 Cream

Topical preparations applied directly to the skin are creams. The forms described as a "viscous liquid or semi-solid emulsions of either the oil-in-water or water-in-oil type have consistency, which varies with oil and water.

These creams are applied cosmetically to cleanse, beautify, enhance appearance, for protection, or for a therapeutic purpose. These topical preparations are used for localized effect for the delivery of the drug into the layer beneath the skin or mucous membrane. These preparations are intended to be administered topically for the site specific better delivery of the drug into the skin in cases of skin diseases.

These creams are considered a pharmaceutical product because they are prepared based on techniques developed in the pharmaceutical industry. Besides, the unmedicated and medicated creams are highly used for the treatment of various skin conditions or dermatoses. Creams can be ayurvedic, herbal, or allopathic that are used by people according to their needs for their skin conditions. They contain one or more drug substances dissolved or dispersed in a suitable base. On the basis of phases, creams can be classified as o/w or w/o type of emulsion. Traditionally, the term 'cream' has been applied to semisolid formulated either as water-in-oil (e.g.: cold cream) or oil-in-water (e.g.: vanishing cream).

1.2 TYPES OF SKIN CREAMS :

They are classified as follows :

Oil-in-Water (O/W) : Creams which are a type of emulsion having small oil droplets distributed within the continuous phase are said to be an emulsion with oil dispersed throughout the water phase is oil in the water (O/W).

Water-in-Oil (W/O): creams consisting of small droplets of water dispersed in a continuous oily phase. When water is the dispersed phase and an oil the dispersion medium, the emulsion is of the water-in- oil (W/O) type. (11-13)

CLASSIFICATION OF CREAMS :

Types of creams according to function, characteristic properties and type of emulsion:

1.Make-up cream (o/w emulsion):

a)Vanishing creams.

a)Cold cream or moisturizing creams.

4.All-purpose cream and general creams.

5.Night cream and massage creams.

6.Skin protective cream.

7.Hand and body creams.

2.GENERAL INGREDIENTS USED IN SKIN CREAMS :

The raw materials which are used in a manufacturing of skin creams include:

Water: This is the most important and widely used raw material in any cream formulation. These are the cheapest and easily available. In skin creams, water is used as solvent to dissolve other ingredients of creams. It can be used for the formulation of creams which contain water and contains any toxins, pollutants, microbes, etc. Water is itself an emulsifier or can form emulsions, it depends upon the quantity of water used in the formulation, and hence sometimes referred as oil-in-water emulsions and sometimes referred as water-in-oil emulsions depending up on the quantity of the oil phase and water phase used. (18)

Oil, fats and waxes: Oil, fats and waxes and derivatives there form constitute an essential portion of creams. Waxes act as an emulsifier, fats act as a thickener and oil act as a perfuming agent, preservative, etc. according to its function. Oil may be two types' mineral and glyceride.

Mineral oil: Mineral oil is composed of hydrocarbons extracted from petroleum oil. Mineral oil is colourless, odourless, and highly refined oil and it is largely used in cosmetics. Mineral oil hardly causes allergic reactions and it cannot become solid and block pores of the skin. It is light weight and inexpensive, it reduces water loss from the body and keeps body moist. A number of mineral oils are used in cream formulation.

Examples:

Light liquid paraffin

Heavy liquid paraffin

Liquid petroleum

Glyceride oil: Glyceride oil is essentially vegetable oils. Few of the examples of glyceride oils are almond oil, arachis oil, castor oil, coconut oil, olive oil etc.

Vegetable oil: Form a barrier on the surface of the skin and retard water loss, thereby supporting plumpness of the skin. Vegetable oils are also added to thicken the lipid or oil base of a cream or personal care product. (19)

Example: Almond oil, germ oil, avocado oil, sunflower oil etc.

Waxes: Beeswax, carnauba wax, ceresin, spermaceti, etc are the waxes used in preparing cream. Waxes is used in cosmetics as it aids in preventing an emulsion from separation of oil and liquid components. These also enhance the thickness of lipid portion and sticks to the surface of the skin.

Fats There are various kinds of fats used in making up creams. These materials can be of animals, plants or mineral origin. Glyceride oils and fats may be of animals or vegetable origin. They consist of combinations of higher fatty acids and glycerin. When saponified they form soap, or fatty acid and glycerin, depending upon process used. The most common of these fatty acid are lauric, margaric, palmitic, stearic, saturated group. Oleic acid is the most liquid and popular unsaturated fatty acid. More specially, the oil most commonly used in other cosmetics are olive oil, almond oil, sesame oil, peanut oil, coca butter fat, mutton tallow, lard and beef stearine. (20)

Lanolin: It is obtained from the fat of wool of a sheep. Lanolin come in two types- the hydrous lanolin contains 25%-30% of water. Anhydrous lanolin has the melting point of 38°C-42°C and has a slight odor. The ingredients act as a lubricant on the surface of skin, which makes it to appear soft and smooth. Lanolin is also effective in forming an emulsion and mixes with other matter used in cosmetics and toiletries.

Colours: Before the discovery of modern technology, colours were essentially derived from natural materials, including turmeric, saffron, indigo, etc. After the 19th century, colours began to be synthesized in the laboratory and proved much more lightfast with a higher degree of colour intensity. Additionally, they could be manufactured without the need to cultivate wild plants. (21)

Emollients: Emollients, or moisturizers, are products that soften skin or treat dry skin. Most emollients are a type of oil or grease, including mineral oil, squalene, and lanolin. They function by enhancing the skin's capacity to retain water, creating an oil layer that protects the skin from losing water, and moisturizing the skin. (22)

Humectants: These are very important multi-functional ingredients of most skin care formulations. Humectants are organic hygroscopic compounds. These are the materials that absorb or retain moisture. It has many benefits such as moisturization, exfoliation, etc. Some examples of humectant are glycerin, Hydroxyethyl urea, betaine, sodium PCA, Sodium-L-Lactate, etc. (23)

Perfumes: Perfume is a substance that provides a scent or order, including a sweet and pleasing smell. Examples of natural perfumes used in creams are-

White Blossoms:

Rosy Dreams

Orange Blossom (24)

Vitamins: Vitamins plays an important role in maintaining the physiological function of whole body and the skin. Vitamin A, B, C, E etc. are generally used in formulation of the creams.

Preservatives: The use of preservatives in cosmetics prevents alteration due to microorganisms and contamination when the cosmetic is prepared, shipped, and stored as well as when it comes into contact with the consumer. Some may also act as antioxidants by protecting from alteration caused by oxygen. Synthetic preservatives can function effectively even in low concentrations. (25)

Moisturizer: Moisturizer or emollient is a cosmetic product used to protect, moisturize, and lubricate the skin. Normal body functions by healthy skin have the support of sebum, and thus, this comes from a Latin verb; mollire, which can be understood as softening. Generally, water has always been lost from a deeper level of the human's skin as it moves about freely through something called transepidermal water loss, TEWL. By regulating its water content, human skin naturally maintains a dry, easily shed surface as a barrier against pathogens, dirt, or damage, while protecting itself from drying out and becoming brittle and rigid. The ability to retain moisture depends on the lipid bilayer between the corneocytes. Moisturizers modify the rate of water loss, with active ingredients of moisturizers falling into one of two categories: occlusives and humectants.

Occlusives: A true petrolatum-based ointment creates a barrier at the surface of the skin such that moisture cannot evaporate. The thicker the formulation, the more potent the effect. Ointments are thicker, or more occlusive, than aqueous creams, and aqueous creams are more occlusive than lotion. Water loss through the skin is typically around 4-8 g/(m²·h). Application of a film of petrolatum to healthy skin can reduce that loss by as much as 50-75% for several hours. Natural lubricants produced by the human body naturally add moisture due to this same mechanism.

Humectants: They absorb water. They absorb this water from the air and moisturize the skin when the humidity is more than 70%, but more often draw the water from the dermis into the epidermis, thereby making the skin drier. A paper published in Skin Research and Technology in 2001 reported that there was no association of humectants with the moisturizing effect. They are used alone in almost all practical applications in combination with occlusives. Moisturizers generally have water in them. The water is a temporary hydrator and at the same time allows some ingredients to be absorbed and the moisturizer itself to evaporate.

Types of Moisturizers :

There are many forms of moisturizers. Amongst these, petrolatum is probably the most effective one; however, people usually find it unattractive in terms of texture as it is oily. Other commonly used emollients are cetyl alcohol, cetearyl alcohol, cocoa butter, isopropyl myristate, isopropyl palmitate, lanolin, liquid paraffin, polyethylene glycols, shea butter, silicone oils, stearic acid, stearyl alcohol and castor oil besides other oils. Moisturizers can

be in various forms such as lotions, creams, ointments, bath oils and soap substitutes. Mineral oils as well as waxes, are not affected by oxidation or rancidity. For this reason, they Moisturizer cosmetics may include antioxidants, ceramides, emulsifiers, fragrances, penetration enhancers, preservatives, and solvents. Some even market their products with terms such as anti-wrinkle and skin enhancing benefits. Many plant and animal extract have been used with numerous claims of skin benefits without good scientific evidence.

Uses:

☑Moisturizers are used in some treatments of diseases of the skin, such as: psoriasis, ichthyosis vulgaris, xerosis, and pruritus in atopic dermatitis. They are more commonly acting as bases or vehicles for the topical drugs, like for example, Whitfield's ointment. Generally, they are compounded with humectants, among which salicylic acid and urea.

☑Moisturizers find extensive use in sunscreens, antiperspirants, skin cleansers, shaving creams, aftershaves, and hair tonics.

Moisturizers are applied in disposable napkins to prevent dry skin and napkin dermatitis.

Benefits of moisturizers :

- ◆ Moisturizing reduces the chances of having problems on your skin.
- ◆ Moisturizing might make other blemishes to disappear.
- ◆ Moisturizing helps keep your skin young.
- ◆ Moisturizing fight wrinkle.
- ◆ Drawbacks of moisturizers.
- ◆ Over -moisturization
- ◆ Allergens.
- ◆ Risk of fire.

Table -1: Role of ingredient

Sr. No	Ingredients	Roles
1	Beal	Anti-bacterial, antifungal, anti-inflammatory
2	Amla	Anti-ageing, hydrates and protect the skin, anti-oxidant
3	Termeric	Anti-inflammatory, anti-oxidant, anti-microbial, anti ageing.
4	Neem	Promote wound healing, relieves skindryness, itching and redness.
5	Bees Wax	Emulsifying agent, stabilizer and gives thickness to the cream.
6	Liquid paraffin	Lubricating agent
7	Borax	Alkaline agent which reacts with emulsifyingagent to form soap
8	Methylparaben	Preservative
9	Rose oil	Fragrance

Material and Methods:-

Plant profile and chemicals

Aegle Marmelos (Beal) :

Aegle marmelos (L) Correa commonly known as Bael or Bilva belonging to family

Rutaceae has been widely used in indigenous systems of Indian medicine due to its various medicinal properties. Aegle marmelos tree is held sacred by Hindus and offered in prayers to deities Lord Shiva and Parvati and thus the tree is also known by the name Shiva duma (the tree of Shiva). Bael tree is native to Eastern Ghats and Central India. It is also native to Indian subcontinent and is mainly found in tropical and subtropical regions. (26)

Bael has been known to be one of the most important medicinal plants of India. More than 100 phytochemicals have been isolated from its different parts including phenols, flavonoids, alkaloids, cardiac glycosides, saponins, terpenoids, steroids, and tannins. These have been well

known to display biological and pharmaceutical activity against chronic diseases such as cancers and cardiovascular and gastrointestinal disorders. Antioxidant, Antiulcer, Antidiabetic, Anticancer, Antiinflammatory, Antimicrobial effects have been reported on various animal models by the crude extract of this plant.

Table No. 1.scientific classification

Kingdom:	Plantae
Order:	Sapindales
Family:	Rutaceae
Subfamily:	Aurantioideae
Genus:	<i>Aegle</i> Corrêa
Species:	<i>A. marmelos</i>

Synonyms : Belou marmelos

Biological Source : Bael consists of the unripe or half-ripe fruits or their slices or irregular pieces of *Aegle marmelos* Corr., belonging to family Rutaceae

Geographical Source : Sub-Himalayan tract and throughout India, especially Central and Southern India, Burma, occurring as wild and also cultivated.

Chemical Constituents : The chief constituent of the drug is marmelosin A, B and C (0.5%), which is a furocoumarin. Other coumarins are marmesin, psoralin and umbelliferone. The drug also contains carbohydrates (11–17%), protein, volatile oil and tannins. The pulp also contains good amount of vitamins C and A. Two alkaloids O-methylhalfordinol and iso-pentylhalfordinol have been isolated from fruits. Other alkaloids reported in the drug are angelinine, marmeline and dictamine.

Uses : Drug is very popular in Ayurveda and is used in diarrhoea and dysentery. Action is attributed to mucilage. Leaves contain alkaloids and are considered useful in diabetes. The oil obtained from seeds possesses antibacterial, antiprotozoal and antifungal properties. The root of *bael* is one of the constituents of well-known ayurvedic preparation Dasmula. In large doses it may lead to abortion, therefore, it can be used as abortifacient agent and hence it should not be used in pregnant women.

Substitutes : Mangosteen fruits: *Garcinia mangostana* Linn (Guttiferae) is a substitute for this fruit, and it can be identified by the darker rind and the wedge shaped radiate stigmas.

Wood apple : *Limonia acidissima* Coor (Rutaceae) is a five lobed fruit with rough exterior part. **Pomegranate rind:** *Punica granatum* Linn (Punicaceae) contain

triangular impressions on the seeds and has astringent taste.

Amla:

Synonyms: Emblica, Indian goose berry, amlk

Biological Sources: - This consists of dried, as well as fresh fruits of the plant *Emblica Officinalis* Gaertn. *Phyllanthus emblica* Linn. Belonging to family Euphorbiaceae.

Geographical Source :- It is a small or medium tree found in all deciduous forests of India. It is also found in Sri Lanka & Myanmar. The leaves are feathery with small oblong pinnately arranged leaflets. The tree is characteristic greenish grey with smooth bark.

Cultivation & Collection :- Amla is grown by seed germination. Amla propagated by budding or cutting. The drip irrigation is most suitable for amla. Plant bears male & female flowers separately. The extent of fertilization is 25 – 30 %. Cultivated plants bear large fruits. The tree flowers in hot season & the fruits ripen during the winter.

Macroscopic Characters :-

Colour :- The green colour changes to lightly yellow or brick red at maturity.

Odour :- Odourless.

Taste

Size :- 1.5 & 2.5 cm in diameter.

Shape :- The fruits are depressed, globular.

Chemical Constituents :- Amla fruits are a rich natural source of vitamin C (Ascorbic Acid) and contain 600–750 mg per 100 g of the fresh pulp. Fruits also contain 0.5 % fat, phyllembelin and 5 % tannin. The fresh fruits contain 75% moisture. The fruits are dehydrated and stored.

Activity : Amla, being a rich source of vitamin C, is considered important to slow ageing process. It improves skin health. Ageing is a cumulative result of damage to various cells and tissues, mainly by oxygen free radicals. Vitamin C is a scavenger of free radicals which breaks them down. ⁽²⁹⁾

Uses :-

- Amla fruits are largely used in Indian medicines.
- It is used as an astringent, diuretic, refrigerant & laxative.
- Dried fruits are given in diarrhoea & dysentery.
- They are also administered in jaundice, dyspepsia and anemia with iron compound.

Tumeric:

Synonym- Indian saffron, haldi, haridra

Biological Name- curcuma longa

Biological Source: Turmeric consists of dried as well as, fresh rhizomes of the plant *Curcuma longabelonging* to the family

Zingiberaceae. **Family-** zingiberaceae

Geographical source- Native to southern India and Indonesia, turmeric is widely cultivated on the mainland and in the islands of the Indian Ocean.

Phyto-constituents: Turmeric contains a yellow coloured substance known as curcuminoids. The chief component of curcuminoids is known as curcumin (50-60%). It also contains volatile oil, resin, camphor, camphene etc.

Neem:

Synonym :- Margosa .

Biological Sources :- It Consists of all aerial parts of plant known as *Azadirachta indica* , Family *Meliaceae*.

Geographical Source :- It Is Found in India , Pakistan , Banglades , Sri Lanka, Thailand , Malaysia , Mauritius, Fiji, South Africa and East Africa.

Chemical Constituents :- Chemicals are isolated from the plant belong to the classes diterpenes (Sugiol), nimbol (Bark) , triterpenes : stimersterol (leaf) etc. The neem leaves contain not less than 1.0% w/w of Rutin.

Activity : Relieves skin dryness, anti-bacterial, antifungal.

Formulation of cream :

Heat liquid paraffin and beeswax in a borosilicate glass beaker at 75 °c and maintain that heating temperature (oil phase). In another beaker, dissolve borax, methyl paraben, in distilled water and heat this beaker to 75 °c to dissolve borax and methylparaben and to get a clear solution. The slowly add this aq.phase to heated oily phase. The add a measure amount of beal extract, turmeric extract, amla extract, neem extract, and stir vigorously until it form a smooth cream the add a few drops of rose oil as fragrance

Evaluation parameters for moisturizing cream :**Physical evaluation-**

Irritancy: Mark the area (1 cm²) on the left-hand dorsal surface. Then the cream was applied to that area and the time was noted. Then it is checked for irritancy, erythema, and edema if any for an interval up to 24 h and reported.

Wash ability : A small amount of cream was applied on the hand and it is then washed with tap water.

Ph : 0.5g cream was taken and dispersed in 50 ml distilled water and then PH was measured by using digital PHmeter.

Viscosity : Viscosity of cream was done by using Brooke field viscometer at a temperature of 25 °C using spindle No. 63 at 2.5 RPM .

Phase separation : Prepared cream was kept in a closed container at a temperature of 25-100 °C away from light. Then phase separation was checked for 24 h for 30 d. Any change in the phase separation was observed/checked .

Spreadability : The spreadability was expressed in terms of time in seconds taken by two slides to slip off from the cream, placed in between the slides, under certain load. Lesser the time taken for separation of the two slides better the spreadability. Two sets of glass slides of standard dimension were taken. Then one slide of suitable dimension was taken and the cream formulation was placed on that slide. Then other slide was placed on the top of the formulation.

Spreadability= m.l/t

Where, m= standard weight which is tied to or placed over the upper slide (30g).

L= length of glass slide (5cm)

T= time taken in seconds

Greasiness Here the cream was applied on the skin in the form of smear and if the smear was oily or grease-like

Result:

Test	Poor	Good	Very Good	Excellent
Irritancy				✓
Washability			✓	
PH		✓		
Viscosity		✓		
Phase separation			✓	
Spreadability			✓	

3. CONCLUSIONS

Thus, from the results, in the study Aegle Marmelos was explored for its moisturization property on skin. It can be concluded Aegle Marmelos extract increases the skin hydration. can be effectively used as skinmoisturising agent in formulated cream. Moisturising cream with 3% Aegle Marmelos extract gives good moisturization as compared to simple cream base. The water extract of Aegle Marmelos gives better skin hydration as compared to chloroform extract.

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BIOGRAPHIES (Optional not mandatory)

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