

FORMULATION AND EVALUATION OF MOISTURIZING CREAM CONTAINING BANANA AND CENTELLA asiatica



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ABSTRACT

Moisturizers are one of the most widely used preparations in cosmetics and have been extensively used to soften the skin for consumers. Moisturizers work effectively in combating dry skin which may cause pain, tightness, itch, stinging, and/or tingling. Dry skin is a common skin aging process. The aging process is related to the increase in the level of radical compound or known as oxidative stress. A cream is a topical preparation usually to the application to the skin. creams are semisolid emulsion that is mixture of oil and water. The dosage forms available for the delivery of topical agents include lotion, ointment paste and powder. The creams unique blend of natural and dermatologically tested ingredients aims to replenish and retain the skin's moisture barrier, preventing dryness and improving skins overall texture. Moisturizers bridge the gap between medicine and consumer goods by being used to make the skin more beautiful and healthier. The main motive of the study aims to prepare a moisturizing cream containing centella extract and banana extract to be used on sensitive skin.

INTRODUCTION

The importance of beautification to the mankind has been known since the prehistoric time and the desire to look beautiful and healthy has been developing the society. In recent times fitness, good health, way of presenting oneself are been counted as one of the qualities of personality, nowadays people are also being judged on the factors hence today there is a necessity and desirable requirement to give more attention to the looks and beautification for social acceptance as well as professional success. The cosmetic surgery industry is dynamic and growth levels reached record height in 2016, the total UK cosmetic surgery was worth an estimated 528.9 million. In recent times cosmetic surgery market is booming due to the development of various technologies especially due to non -surgical techniques being developed.

The term cosmeceutical, uniting the words cosmetic and pharmaceutical was popularised by Dr Albert Kligman in 1980s. Cosmeceuticals are topical agents that offer properties of both cosmetics which beautify or enhance appearance and drugs which therapeutically alter the skin physiology and reverse the disease process. They typically contain at least one distinguishing ingredient and purport beneficial effects beyond the abilities of purely cosmetic products, commonly claiming to improve skin function, texture, tone, radiance, or firmness. Cosmeceutical affects biological functioning of the skin depending upon the ingredients present in them. They increase collagen growth in the skin and reduces the harmful effects of free radicals thus maintain the structure of keratin in good condition and making the skin healthier. Cosmeceuticals include most of the bioactive food components such as milk peptides certain vitamins and minerals, phytonutrients from herbs, various oils and botanical extracts. Cosmeceutical markets in nowadays more flourished with several botanicals having a history of their use in traditional cultures. More and more cosmeceuticals are being used in cosmetic products due to there fewer side effects and added advantage of multifunctionality.

The appearance and function of the skin are maintained by an important balance between the water content of the stratum corneum and skin surface lipids. The skin represents the most superficial layer of the body, and so it is constantly exposed to different environmental stimuli. Exposure to external factor as well as endogenous factors may disrupt this balance. In addition, frequent use of soaps, detergents, and topical ingredients such as alcohol and hot water can remove the skin surface lipids. Disruption of skin barrier leads to the various types of skin problems most common condition is a loss of water content which leads to dryness of skin such as, scaling, cracks, redness, and an uncomfortable feeling of tightness, sometimes with itching and stinging. Transepidermal water loss (TEWL) is the amount of water that passively evaporates through skin to the external environment due to water vapor pressure gradient on both sides of the skin barrier and is used to characterize skin barrier function. The average TEWL in human is about 300–400 mL/day; however, it can be affected by environmental and intrinsic factors. In high humidity, the amount of water loss will decrease due to the drop in the water vapor pressure gradient. TEWL varies in different anatomic sites and is inversely related to the corneocyte size. Skin sites with smaller corneocytes have higher TEWL values.^{26–28} Multiple instruments are commercially available to measure TEWL, providing valuable data with applications in clinical settings, toxicology, and product

development. TEWL is a sensitive indicator of skin irritation and is widely used in objective analysis of irritancy potential or protective properties of topical products. The accuracy of TEWL measurements can be influenced by environmental factors such as humidity, temperature, ventilation, and intrinsic factors. It is essential that these measurements be conducted under standard conditions. Maintains of an optimal level of hydration by the stratum corneum (SC) is largely depend on several factors first, intercellular lamellar lipids, organised predominantly in an orthorhombic gel face, provide an effect barrier to the passage of water through the tissue. Secondly, the diffusion path length also retards water loss, since water must traverse the tortuous path created by the stratum corneum layers and corneocyte envelope. Thirdly, an equally important is natural moisturizing factors (NMF), a complex mixture of low-molecular weight water soluble compounds first formed within the corneocytes by degradation of histidine rich protein known as filaggrin. Each maturation step leading to the formation of an effective moisture barrier including corneocytes strengthening, lipid processing, and NMF generation is influenced by the level of stratum corneum hydration. these processes as well as the final step of corneodesmolysis that mediates exfoliation, are often disturbed upon environmental challenge, resulting in dry flaky skin conditions.

Thus, to maintain skin in good and healthy condition use of moisturizing product with good and effective barrier agent and moisturizing agent is essential. Moisturizers provide a thin protective film of oil and water over the skin surface which prevent evaporation of natural moisture and replace the skin natural oil when these are depleted by variations in climatic and living conditions. Treatment with moisturiser aims at maintaining skin integrity and well-being by providing a healthy appearance of the individual. Numbers of moisturisers are available under the label of natural, safe, organic, herbal while the basic properties of humectant, occlusivity and emolliency are consistent across all moisturizers. Most of the available moisturizers used synthetic adhesives, emulsifiers, perfuming agents, pigments, surfactants, and thickeners to form the base. There is extensive need to replace toxic synthetic agents from the base using natural agents. Moisturizer includes emollients, occlusives and humectants. They are the most useful product for the management of various skin conditions (examples psoriasis, aging skin, atopic dermatitis).

An ideal moisturizer should:

- Reduce and prevent trans epidermal water loss
- Restore lipid barrier, i.e., duplicating and enhancing skin moisturizing retention mechanisms
- Hypoallergic, no sensitizing, fragrance free, non-comedogenic
- Absorbed immediately, providing immediate hydration
- Cosmetically acceptable
- Affordable

BANANA



Fig 1: Banana

Banana is an edible fruit and is herbaceous flowering plant belonging to family genus *Musa* and family *Musaceae*. All the edible banana fruits are seedless and belong to two main species, *Musa acuminata* Colla and *Musa balbisiana* Colla. Bananas contains vitamin B6, C and a high percentage of water, which nourishes and hydrates the skin. These nutrients also help to maintain elasticity of skin. Banana plants are widely used for various purpose of human life and are known as multipurpose plant because, in addition to the fruit, other plant parts can also be used, ranging from tubers to their leaves (Cahyono,2009). In the field of medicine, bananas are known for their beneficial effects on digestion and cell rejuvenation effects. Banana help retention of calcium, phosphorus, and nitrogen which help to regenerate tissue. Also, bananas have benefit to overcome constipation and diarrhoea overcome dysentery, reduce the symptoms of arthritis and gout, treat anaemia, uremia, treat menstrual problems, and allergies (Arya,2014).

Banana contains:

- Potassium
- B-vitamins
- Vitamin A
- Zinc
- Vitamin C
- Vitamin E
- Amino acids
- Carotenoids
- Phenolic compounds
- Antioxidant compounds

Benefits include:

- Vitamin A in the banana extract heals the dry skin and act as skin moisturizer to make it soft.
- It contains alpha hydroxy acids(AHA) which act as a great exfoliator and controls oil and sebum on the skin surface.
- Banana extract help treat acne because of the many nutrients they have (including vitamin A , zinc and manganese), which have anti-inflammatory property.
- The level of antioxidant and contents of vitamins in the banana extract allow the user to prevent wrinkles and it has anti-ageing effect.
- Banana peels are naturally anti-microbial due to their high polyphenol content and are an excellent method to cleanse the skin. These polyphenols also have antioxidant effect which is why banana peel oil is a fantastic component to use in face serums.

Potential side effects of using banana on skin

Although unusual an allergic response to banana is likely. People who are allergic to banana or latex are advised not to use it. Pollen allergies might increase chances of developing banana allergies.

The following symptoms may indicate an allergic response to banana face mask:

- Itching skin
- Swelling of the skin
- Sneezing
- Wheezing and other asthma symptoms

A severe allergic response from banana is also possible. Anaphylaxis is a potentially fatal disorder that need immediate medical attention. breathing difficulty, face puffiness and fainting are all symptoms.

CENTELLA ASIATICA



Fig 2: Centella asiatica

Centella asiatica, also known as Gotu kola is a herbaceous, perennial plant in the flowering plant family Apiaceae. It is indigenous to the Indian subcontinent, southeast Asia and parts of Australia. It is widely available in multiple skin treatments, from moisturizers to toners to creams. It is effective in improving treatment of small wounds, psoriasis and scleroderma. The mechanism of action involves promoting fibroblast proliferation and increasing the synthesis of collagen and intracellular fibronectin content and also improvement of the tensile strength of the newly formed skin as well as inhibiting the inflammatory phase of the hypertrophic scars and keloids. The naturally occurring antioxidant, anti-inflammatory compounds and carbohydrates in *Centella asiatica* may also make the herb effective in improving skin hydration and providing anti-aging action. As a result, the manufacturers often include the herb in moisturizers that target dry and sensitive skin.

It is also used in folk medicine as an antipyretic, diuretic, rheumatic, antibacterial and antiviral medicine as well as for boosting cognition, reducing anxiety and acting as an anti-cancer agent. It was once used to treat epilepsy, hysteria, leprosy, minor itching and bug bite. The saponins contained in it such as asiaticoside, asiatic acid, madecassoside and madasiatic acid are responsible for the plant's skin benefits.

It is highly recommended for dermatological disorders; reduce skin irritation by restoring the skin barrier function, reduce redness and lowering the pH of the skin. Our endeavour has been to formulate moisturizer with banana extract and *Centella asiatica* to evaluate its efficacy and safety parameters has compared to available commercial moisturizer.

Centella asiatica contain:

- Carbohydrates
- Tannins
- Steroids
- Terpenoids
- Alkaloids
- Flavonoids
- Cardiac glycosides
- Saponins

The benefits of Centella asiatica in skincare

- It moisturizes dry, sensitive eczema prone skin, it does a great job by keeping the skin hydrated. It also helps the skin barrier retain moisture and reduce redness and inflammation. that's especially important for people with conditions like eczema or rosacea which can dry out and sensitise the skin.
- It helps with burns and wound healing. Antioxidants help fight off free radicals, which are small molecules that eat up the good parts of our defense system, damaging DNA and skin barrier. Centella increases antioxidant level to help fight off those free radicals.
- It is used to remove stretch marks and cellulite, centella extract can improve microcirculation and regulate connective tissue cell metabolism.
- It has anti-ageing benefits. Centella was found to be effective at increasing collagen, particularly type I collagen. Madecassoside is thought to increase collagen expression by activating specific signalling pathways, and vitamin C stimulate collagen by using a different pathway , so when combined these maybe effective at increasing collagen levels in the skin due to different mechanism of action.