



EXPLORING THE EFFICACY OF ICE APPLE AND ALOE VERA-ENRICHED FACE SERUMS: A COMPREHENSIVE REVIEW"

SAHIL CHAVAN¹, SIDDHI RIKAME², NILAM NILE³

^{1 2 3} Chhatrapati Shivaji Maharaj University, Panvel, Navi Mumbai, India.

ABSTRACT:

Face serum can be use for eaveryday life , hydrate, and protect your skin while helping to clarify and clear acne. The serum works to enhance your skin's natural airborne regeneration with the incorporation of mild ingredients, natural fragrances and most importantly no harsh chemicals and parabens face serum are lightweight. quick-absorbing facial serum that delivers concentrated active ingredients into the skin. Packed with potent antioxidants, moisturizers, and revitalizing compounds, it leaves your skin looking smoother and plumper while diminishing the signs of age and promoting a luminous, even complexion. Ideal for all skin types, this serum helps support the skin's natural environmental defenses, and enhances the appearance of dry or damaged skin.

KEYWORDS:-, Anti-inflammatory, Natural coolant , Tropical fruit skincare ,Ayurvedic skincare.

INTRODUCTION: 1

"Hydration From the Heart of Nature." As the largest organ, skin is constantly exposed to environmental influences that can take their toll in the form of UV radiation, pollution, and dehydration. These can cause premature aging, dryness, irritation and the like. 'Hydrating serums, often light and easily absorbed solutions, are an essential cog in the skin care while when it comes to adding moisture and actives into the epidermis, The best face hydrating serums are also formulated with ingredients to help reinforce and support the stratum corneum. Thus, formulating a hydrating face serum with Ice Apple as a major bioactive would cater to this contemporary preference of consumers for natural, multifunctional , and gentle skincare solutions .

WHAT ARE FACE SERUM ?

- A concentrated skincare product with active ingredients is called a face serum.
- It is thinner than moisturizers or creams and has a light, quickly absorbing texture.
- Made to deliver targeted treatment by penetrating deeply into the skin Depending on the skin issue, they are frequently water-, oil-, or gel-based

OBJECTIVE OF USING FACE SERUM

- Face serum help in dehydration, dullness, pigmentation, wrinkles, and acne.
- The deeper layers of the skin receive intense moisture from ingredients like hyaluronic acid.
- It also help in discoloration, smoothes the skin, and refines pores.

ACTIVE INGRIDIENT USED IN FACE SERUM :

1.ICE APPLE [*Borassus flabellifer* L.]²

- Common Name: Ice Apple, Sugar Palm Fruit, Taal, Tadgola
- Botanical Name: *Borassus flabellifer*
- Kingdom: Plantae
- Clade: Angiosperms
- Clade: Monocots
- Order: Arecales
- Family: Arecaceae (Palm family)
- Genus: *Borassus*
- Species: *Borassus flabellifer*



IMAGE OF ICE APPLE

Geographical classification

Ice Apple (*Borassus flabellifer*), also known as Tadgola in India or Nungu in Tamil, is the translucent, jelly-like fruit of the palmyra palm. It's commonly found in tropical regions, particularly in South and Southeast Asia. Ice Apple grows in: India – Particularly in Tamil Nadu, Andhra Pradesh, Maharashtra and Sri Lanka

CHEMICAL COMPOSITION

The majority of the ice apple (*Borassus flabellifer*) is water (more than 85%), with only a small amount of fat, 0.5–1% protein, and 9–11% carbs. It also contains minerals like calcium, iron, and potassium, as well as vitamins A, C, and B-complex. The fruit is nourishing and refreshing because it contains bioactive compounds and antioxidants.

Benefits of Ice Apple for Skin

Hydrates and Moisturizes: The high water content of ice apples (above 85%) keeps the skin hydrated, supple, and soft, which is particularly advantageous in hotter climates.

Prevents Pimples and Acne: Its anti-inflammatory and cooling qualities can lessen skin irritation and stop heat-related breakouts like pimples and acne.

Combats Skin Infections: Antioxidants and antibacterial substances found in ice apples may help shield the skin from rashes and minor infections.

Encourages Skin Healing: The antioxidants and nutrients aid in the regeneration and repair of skin cells, hastening the healing process after irritation or sunburn.

Enhances Skin Glow: Consistent use helps the skin glow naturally by increasing blood circulation and eliminating toxins.

Reduces Skin Inflammation: Redness, itching, and other inflammatory skin conditions are alleviated by its anti-inflammatory properties.

2. ALOE VERA 3

- Kingdom- Plantae
- Order- Asparagales
- Division- Spermatophyte
- Subdivision- Angiospermae
- Class- Monocotyledoneae
- Genus- Aloe
- Species- Barbadensis Mill
- Botanical name: Aloe barbadensis miller
- Synonyms: Aloe, Musabbar, Kumari
- Family: Asphodelaceae (Liliaceae)



Biological source: Aloe is the juice that has been dried out by a process of cutting at the base of the leaves of different species of Aloe.

Geographical source :-4

Aloe is indigenous to eastern and southern Africa, and is cultivated in countries such as Cape Colony, Zanzibar, and Socotra. It is also grown in the Caribbean, Europe and to a limited extent in parts of India (eg the North West Himalayas). Aloe grows naturally in arid climates and is common in Africa, India, and other dry areas.

Chemical Composition: 4

It consists of polysaccharides including acemannan that is good for moisturizing and hydration of the skin. Aloe contains glycoproteins, vitamin A, C and E. It also contains enzymes such as amylase and lipase and also minerals like calcium, zinc.

Aloe Vera benefits for skin:5

- Moisturized skin - Keeps skin hydrated and avoiding dryness.
- Relieves and calms - Relieves irritation, inflammation and cools the skin.
- Manages acne - Antibacterial ingredients aid in minimizing pimples and breakouts.
- Anti-aging impact - Generate collagen, and reduce wrinkles.
- Antioxidant and antibacterial - Helps to guard skin against free radicals and manages germs.
- Plant Compounds - Contains skin-friendly and health-promoting vitamins, enzymes, and minerals.
- Helps control dental plaque - Good for keeping the teeth clean.
- Heals mouth ulcers - Aids in the treatment of canker sores.
- Relieves constipation - Natural laxative (use with caution).
- Reduces blood sugar - Can assist in regulating blood sugar levels in diabetics.
- Healing - Accelerates healing of cuts and burns.

Almond Oil :- 6



Almond Oil relieves and heals skin irritation and minor wound. It is also beneficial for tone and complexion. The oils are deeply moisturizing without any greasiness. It fights acne and bacteria, thanks to its antibacterial properties and vitamin A. It reduces signs of ageing, sun damage and scars, because of the vitamin E it contains. The skin oils are rapidly absorbed and make the skin feel smooth. It can also be a light wash to cleanse the skin and take off makeup.

Coconut oil :- 7



Coconut oil: Coconut oil is an edible oil extracted from the kernel or meat of mature coconuts harvested from the coconut palm (*Cocos nucifera*). Recognized for its unique flavor, fragrance and myriad uses in cooking, beauty and medicine. It has moisturizing fatty acid and linoleic acid in addition to other skin essentials that help prevent premature aging.

Rose water :- 8



This amazing pH balancing property of rose water makes it a great skin toner. The main phytoconstituents of rose water are flavonoids, triterpenoids, tannins, and polyphenolic compounds. It is mainly these components that are responsible for the anti-inflammatory and antioxidant properties of the water

Other ingredients used for the formulation of the face serum :-

- Glycerin
- Vitamin E
- Tween 20
- Sodium Benzoate

Material and Collection:

SR NO	INGRIDIENTS	CATEGORY
1	ICE APPLE	ANTI ACNE
2	ALOE VERA EXTRACT	ANTI AGING
3	GLYCERINE	TONER [SKIN HYDRATE]
4	COCONUT OIL	MOISTURIZER
5	VITAMIN E	ANTI OXIDANT
6	ROSE WATER	TONER

7	TWEEN 20	EMULSIFYING AGENT
8	SODIUM BENZOATE	PRSERVATIVE

Extraction Method :-

Extraction Method of ice apple water :-10

The ice apple fruit was procured from a nearby farm. It is carried in 2–4 cluster seeds and is enveloped by a black husk. The fruit has to be sliced off from the top for the sweet, translucent pale-white jelly seed sockets to be scooped out. The jelly fruit is full of watery juice within and is covered with a thin, yellowish-brown skin. An 18-gauge needle was introduced into the jelly portion of the fruit through the yellowish brown in color skin, the fluid was aspirated in a sterile syringe and filtered through syringe filter (0.45 µm).

Extraction Method of aloe vera 11

Freshly cut leaves of Aloe vera were washed and sterilized with 70% ethanol. With the use of a sterile hood and knife, the inner gel (flesh) was carefully peeled from the outside leaf rind. The inner gel was triturated with a mortar and pestle to obtain a homogenate and was then filtered through 0.45-mm filter paper to get AVE. About 60 ml of AVE was diluted with 140 microliters of DMEM solution to obtain 30% of AVE.

Preparation of serum for face Emulsion (o/w) of formulation was prepared as per formula.¹²

1) Preparation of oil phase: almond oil, tween 20 and coconut oil were incorporated and then mixed well continuously for 10 minutes to obtain a homogenous oil solution

2) Preparation of water phase: The water portion of the emulsifier is also prepared at the same time by mixing ice apple extract, aloe vera extract, glycerin, sodium benzoate and rose water upto qs.

3) Emulsification method: Emulsion was obtained by slowly adding oil phase to liquid phase dropwise under mechanical agitation at 25000 rpm to form o/w biphasic emulsion. The extracted final product is placed in an amber color glass bottle.

4) Take evaluation parameter of Face Serum.

EVALUATION OF FACE SERUM :-

Physical appearance :- Formulation was viewed visually for Colour and appearance. It was also added from the beginning of the formulation of the extracts was uniform. This test was corroborated by vision and by feeling.¹³

pH Value :- The standard buffer solution was used to calibrate the pH meter. Appropriate weight of the face serum (approximate 1 ml) was weighed and dissolved in 50 ml of distilled water and ultimately pH of the resulting solution was measured. 5.The skin is an acid environment, and the pH of the skin serum should be 4.1 - 6.4. ¹³

Microbiological Analysis :- The methods involve introducing the mixed culture directly into tubes of liquid agar medium, diluted appropriately. The medium is kept as a liquid at 45. ¹⁴

Measurement of spreadability: 2 gm of serum sample was spread over the one side table. One end of the slide was joined to a pan to which 20 gm wt. was added. The time needed to remove the upper slide from the surface was considered as an indication for spreadability.¹⁴

Stability testing : When a new and probably modified formulation of a medicinal product has been developed, it must be subjected to an appropriate programme of stability testing to determine its physical, chemical and microbiological stability and to establish its safety.¹⁵

Cyclical Temperature: It is not performed in fixed temp and relative humidity. In the present testing temperature was varied on a daily basis. At room temperature and in frizzling temperature to encourages the temperature differences. ¹³

Patch Test :- Test a little serum on the inside of your forearm or behind the ear. Leave it on for 24 hours. Look for redness, itchiness or swellings. If there is no reaction, it is probably safe to use on the face.¹⁶

CONCLUSION

The hydrating face serum containing aloe vera and ice apple combines two powerful natural ingredients known for their skin benefits. Aloe vera is rich in vitamins, enzymes, and antioxidants that deeply moisturize and soothe the skin, while ice apple offers a cooling effect and hydrates with its high water and mineral content. Used together, they enhance each other's effects—aloe vera improves skin absorption, and ice apple boosts hydration and freshness. This combination shows great potential for natural skincare, and future research will be carried out to explore its full effectiveness, safety, and long-term benefits.

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