

Review on Face Serum

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Abstract

Face serums are specialty skincare concoctions that target particular issues and produce noticeable results by deeply delivering powerful active ingredients into the skin. These thin, highly concentrated products are usually made with a combination of healthy ingredients such as retinol, hyaluronic acid, Vitamin C, or alpha-hydroxy acids. Depending on how they are made, face serums can have a wide range of effects, but they frequently have hydrate, anti-aging, brightening, exfoliating, soothing, and oil-control properties. You can address your specific skincare concerns and achieve healthier, more radiant skin by adding the right serum to your skincare routine. Over the past 10 years, the cosmetics industry has consistently expanded. The large and expanding youth population is one of the main factors driving growth in this category. Indian women today are more concerned with keeping their skin youthful and radiant by minimizing wrinkles and changing the color of their skin. This has led to an increase in the market for skin care products of all kinds. Like any other cream, serum is a highly concentrated product based on water or oil. A small number of ingredients in the serum are intended to maximize the availability of the active ingredient, which could be a growth factor, vitamin, botanical extract, etc. Because the serum has a lower viscosity, it absorbs more quickly and penetrates the skin's deep layers to target different areas and provide the most nourishing skin. Face serums address a variety of skincare needs by providing hydration, anti-aging benefits, brightening effects, exfoliation, soothing qualities, and oil control. Face serums, which provide customized solutions for attaining healthier, more radiant skin, have become essential components of contemporary skincare routines due to their lightweight texture and potent efficacy. Photodamage and ultraviolet exposure can cause unwanted outcomes such as wrinkles on the face and aging of the skin. The deep formula of the serum has a high concentration of active ingredients, a non-greasy finish, quick absorption, and the capacity to penetrate the skin's deep layers. The goal of the research was to create a serum using a polyhedral extract based on these features. Face serum is a highly concentrated cosmetic product made of olive oil, betel fruit extract, and *Aloe vera* gel. Face serum made with *A. vera*, bael fruit extract, and olive oil is a very potent cosmetic. *A. vera* serum can absorb quickly and penetrate deeper, which gives us immediate cosmetic benefits as well as psychological satisfaction.

Key words: Effect of face serum, history of face serum, key ingredient of face serum, types of face serum

INTRODUCTION

Growing awareness of the potential benefits of botanical ingredients has led to a noticeable shift in skincare products in recent years toward natural and herbal options. Herbal face serums have become a well-liked option among these for people looking for gentle yet effective skincare products. With a holistic approach to skincare, these serums use the power of nature to address a range of skin concerns. Herbal face serums are made of natural ingredients such as oils and concentrated botanical extracts, and they are lightweight and quickly absorbed.^[1] The purpose of these serums is to provide the skin with powerful antioxidants, vitamins, minerals, and nutrients, resulting in a complexion that is healthy and glowing. Serums are more effective

at addressing particular skincare issues because they have higher concentrations of active ingredients than traditional moisturizers do. Serums are a kind of moisturizing skin care product that can penetrate the skin more deeply and release active ingredients. A good face serum can increase hydration, minimize pore size, and give your skin a smoother, firmer structure. Antioxidants, chemicals that interact with cells, and skin-like ingredients should be present in every one of these products — moisturizer, anti-wrinkle, anti-aging,

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or face serum.^[2] For every skin type, these ingredients are essential for the healthiest possible complexion. Gel and liquid preparations are ideal for oily and combination skin; serum and light lotion are ideal for normal to dry skin; and more emollient lotions and hydrating cream are ideal for extremely dry to extremely dry skin.

The skin, the largest and most protective organ of the body can sometimes appear for several reasons, such as exposure to ultraviolet (UV) radiation, pollutants, and makeup that has been worn overnight and may have caused allergic or irritated reactions. *Aloe vera* and bael fruit extract are two different anti-oxidant and anti-aging ingredients that can maintain the appearance of young, healthy skin.^[3] The leaf gel is useful topically for cuts, burns, and abrasions; it can also be applied topically for skin conditions that cause itching, such as shingles and psoriasis. Combining *A. vera*'s excellent moisturizing properties with essential oils results in products that are great for both skin smoothing and sun protection. Ayurveda recommends *A. vera* for a variety of skin conditions because of its refreshing and calming qualities. *A. vera* extract's antibacterial and antifungal qualities may also be helpful in the treatment of mild cutaneous conditions. The phenolic acid and *Marmelos* found in *Aegle marmelos* fruit are excellent antioxidants.^[4] The increased cost of living across the globe has led to a rise in the demand for cosmetic products. The cosmetics industry, headquartered in Malaysia, is one of the most important sources of economic resources. With the rise in society's desire to feel and look young and attractive, cosmetics have become more and more valuable. An effective way to transfer active substances to the skin is through a serum, which can be a gel, light moisturizer, or lotion. More hydration, elasticity, smoother texture, and the appearance of smaller pores can all be achieved with an excellent skin serum. Cell-derived compounds, antioxidants, and skin-like substances should be present in all skin care products, including serums, anti-aging, anti-wrinkle, and moisturizing cosmetics. The healthiest possible skin requires these components for all skin types. The best products for oily skin are gel preparations and liquids; for normal to dry skin, serums, and light lotions; and for extremely dry to very dry skin, creams with a greater emollient content.^[5] The largest and most protective organ of the body, the skin can occasionally become dry for a variety of causes, such as exposure to UV radiation, grime, and cosmetics left on overnight that may irritate or create allergies. To apply the ingredients straight to your skin, use a skin care product called skin serum after cleansing but before moisturizing. Due to its small molecule composition, which allows it to completely penetrate the skin and deliver a highly concentrated concentration of active substances, the serum is especially well suited for this purpose. At present, they help identify certain skincare concerns such as aging and color markers. As stated in the Health Sciences Authorities, Revised 2014 Guide to the Control of Cosmetic Products, a "cosmetic product" is any item designed to be integrated with the lips, eyes, teeth, hair system, and oral mucosa, among other external body parts,

with the main objective being to clean, perfume, change their appearance, control body odor, protect, or maintain them in good functioning order. Skin care products, hair care products, and perfumes are the three main types of readily available cosmetics. Products for maintaining and caring for the skin include creams, oils for massage, moisturizers, antimicrobial oils, and fairness creams. The serum is a non-oily skin care product that is perfect for the skin. Its active composition is highly concentrated, making it one of the best cosmetic products for delivering nourishment to the deepest layer of the skin. The way cosmetic serum is absorbed and reaches the skin's deeper layers determines its classification. Cosmetics are extremely necessary in today's world, and many people use them daily.

HISTORY OF FACE SERUM

Given that the dictionary defines a serum as the clear, yellowish fluid obtained by separating whole blood into its solid and liquid components after it has been allowed to clot, it is not unexpected that the forebears of current serums were based on horse blood, egg albumin, and beef placenta. The sterility of the ampoules containing oxyquinoline (and later parabens) was utilized to ensure the items' commercial availability. When products had short shelf lives and tiny batches had to be made and eaten immediately to avoid rotting, this technique has been used since then. People valued cleanliness, physical activity, and skincare highly in the 1800s. Even though skin lightening with zinc oxide was the goal, allergic responses were common. Hygiene products became more widely available and less costly.^[6] To help the skin and lessen imperfections, harsh cleansers, egg yolks, honey, and oatmeal were frequently used. In addition, the skin was naturally bleached a few shades lighter with lemon juice. In addition, during this time, products used in skincare routines such as chapstick, baby powder, and vaseline were developed. In terms of easily accessible skincare products for women, the 1900s saw an explosion. Both Burt's Bees and Murad's lines were introduced in the 1980s and 1989, respectively. The Food and Drug Administration approved Botox in 2002 for the treatment of facial frown lines. In just a few treatments, bacteria are killed and rendered invisible by the Zeno, a hand-held, battery-operated gadget that was introduced in 2007. Since^[7] their introduction in the 1930s, serums have undergone significant change and have progressed significantly.^[8] At that point, the first facial serums were made available for purchase. Naturally, their shelf life was quite short due to their high susceptibility to bacterial and fungal infections; however, the underlying principle of these products was developed. The original serums were designed to tighten the face and minimize wrinkles. These serums were typically based on albumin, which is a tightening agent found in egg whites and has been used as a facial mask by women for centuries worldwide.^[9] After separating the egg whites from the yolks, whisking them up, and applying them to the face and neck for 15–20 min, the mixture was removed with

cold water. Similar to a serum, this resulted in a lifted and tightened appearance. Small molecules in most cases allow a serum to penetrate all layers of the skin without blocking pores with oil, glycerin, or other comedogenic fillers.^[10]

TYPES OF FACE SERUM

The oil serum

Naturally occurring substances such as oils and concentrated botanical extracts go into making herbal face serums, which are lightweight and easily absorbed. Strong antioxidants, vitamins, minerals, and nutrients are what these serums are meant to supply the skin with, leaving it with a radiant, healthy-looking complexion. Given that serums contain higher concentrations of active ingredients than traditional moisturizers, they are more effective at treating specific skincare issues. Aside from providing extra active ingredients to address particular skincare issues such as aging, dryness, or dullness, oil serums are designed to provide the skin with intense hydration and nourishment.^[11] A combination of plant-based oils, such as rosehip, argan, or jojoba oils, which are high in antioxidants and fatty acids, is frequently found in oil serums. By re-establishing the lipid barrier of the skin, these oils aid in retaining moisture and raising general hydration levels. Apart from oils, active ingredients such as vitamins, peptides, or botanical extracts that target particular skin concerns can also be found in oil serums. For instance, hyaluronic acid (HA) can plump and hydrate the skin, whereas Vitamin C can help even out skin tone and brighten it.^[12] Oil serums have become quite popular in the skincare industry, drawing in beauty enthusiasts with their opulent textures and powerful advantages. These specialty formulas, which are frequently enhanced with a mixture of botanical oils, offer the skin a multitude of benefits, from intense moisturization to antioxidant defense. Let's explore the ins and outs of oil serums and see why they are such a valued part of contemporary skincare regimens. Concentrated mixtures of natural oils are used in oil serums, which are thoughtfully chosen to provide the skin with an abundance of nutrients, antioxidants, and emollients. Oil serums offer a higher concentration of lipids than traditional moisturizers, which are primarily composed of water-based ingredients. This makes them especially effective at strengthening and nourishing the lipid barrier of the skin. They are extremely hydrated oil serums rich, emollient composition enables them to deeply penetrate the skin, rehydrating and sealing in moisture for long-lasting hydration. Those with dry skin and those who live in arid climates will particularly benefit from this. An oil serum is usually used before moisturizing but after cleansing and toning. Since oil serums are so concentrated, a tiny amount is usually plenty. Use upward motions to gently massage the serum into the skin until it is completely absorbed.^[13] While oil serums can be helpful for a variety of skin types, people with oily or acne-prone skin may want to use them in moderation or choose oil-free

serums to prevent aggravating breakouts. Patch testing is always a good idea before using any skincare product, and seeing a dermatologist is advised if you have any concerns or particular skin conditions. They have formulas that are rich in nutrients. A wide variety of botanical oils, each packed with vital fatty acids, vitamins, and antioxidants, are frequently featured in oil serums. Together, these nutrients nourish the skin and fight the signs of aging, resulting in a healthier, more radiant complexion.^[14]

The gel serum

A kind of skincare product known as “gel serum” combines the qualities of a gel and a serum. Gel serums absorb into the skin quickly and do not leave a greasy or heavy residue because of their lightweight and gel-like consistency. Like traditional serums, they are usually made with a high concentration of active ingredients to address particular skincare issues. Gel serums give the skin a “tightening” feeling that makes your customer's skin appear temporarily lifted or tightened in specific facial areas.^[15] Because this formulation is water-based, the gel serum allows you to incorporate some amazing water-based (hydrophilic) plant extracts. The ability of gel serums to hydrate skin without leaving it feeling greasy or heavy is one of their main selling points. They frequently include humectants, such as glycerin or HA, which draw moisture to the skin and support skin hydration throughout the day. Because of this, gel serums are especially suitable for people with combination or oily skin types who might be more likely to experience breakouts or congestion from thicker formulas.^[16] To address particular skincare concerns, gel serums may also contain other beneficial ingredients such as antioxidants, vitamins, or peptides in addition to hydration. For instance, peptides can support the formation of collagen and gradually improve the firmness of the skin, whereas Vitamin C can help protect against environmental damage and brighten the complexion. In general, gel serums are a popular option for people looking for lightweight yet powerful formulations for their skincare routine because they provide a refreshing and efficient way to deliver targeted skincare benefits without weighing down the skin. Because of their lightweight texture, gel serums are usually applied after cleansing and toning but before moisturizing. This allows them to penetrate the skin more effectively.^[17] Usually, a tiny bit of product is enough, and it can be thoroughly absorbed into the skin by gently massaging it in upward motions. The majority of gel serums are non-greasy and lightweight, which means that all skin types including combination and oily skin can use them. They are perfect for use during the day or in humid climates because they hydrate the skin without feeling heavy. They have got an elevated concentration of active components gel serums have a high concentration of active ingredients such as peptides, vitamins, antioxidants, and HA, just like traditional serums do. These components help with fine lines and wrinkles, uneven skin tone, dullness, and dehydration, among other skin care issues. Gel serums'

gel-like consistency allows for rapid absorption into the skin, allowing powerful ingredients to be absorbed deep into the skin's underlying layers.^[18] Effective hydration and nourishment of the skin are facilitated by this quick absorption. In general, gel serums possess versatility as they can be applied either independently or in combination with other skincare products such as sunscreen or moisturizers. In addition, you can incorporate them into your skincare routine in the morning and the evening. They have obtained sensitive or irritated skin and can benefit greatly from gel serums' cooling and soothing properties, which are attributed to their lightweight and refreshing texture. When using a gel serum, it is usually applied before moisturizing, but after cleansing and toning. As gel serums are very concentrated, a tiny amount is usually plenty. Use upward motions to gently massage the serum into the skin until it is completely absorbed.^[19]

The water-based serum

While gel-based serums may or may not contain thickeners and gums, they are comparable to water-based serums. The high-performance hydrophilic plant extracts trapped against the skin beneath a cream or lotion would be applied with a water-based face serum. Applying an anti-aging face mist first under an emulsion and then oil is the ideal method to promote increased absorption of water-based compounds into the skin and transport their high-performance components a little bit deeper into the skin layers.^[20] Higher component penetration will be facilitated by the occlusive barrier that the oils will create. Water-based serums are thin skincare formulas with water as the primary ingredient. This makes them perfect for providing skin with hydration without leaving the skin feeling weighed down or oily. These serums usually have a high concentration of active ingredients that dissolve or float in water to facilitate the skin's rapid absorption. Intense hydration is one of the main advantages of water-based serums, which makes them ideal for all skin types – including oily and acne-prone skin. They frequently include humectants, which are substances that take moisture from the air and transfer it to the skin to plump and hydrate the complexion. Examples of these include HA, glycerin, and *A. vera*. Water-based serums not only hydrate but can also address specific skincare concerns by including vitamins, antioxidants, or botanical extracts, among other beneficial ingredients. For instance, panthenol, or Vitamin B5, can help relax and soothe irritated skin, and niacinamide, or Vitamin B3, can help reduce the visibility of pores and enhance the texture of the skin. Since their lightweight texture makes them more effective at penetrating the skin, water-based serums are usually applied after cleansing and toning but before moisturizing. It is usually sufficient to use a small amount of serum, which can be gently massaged or patted into the skin until it is fully absorbed. All things considered, water-based serums are a flexible and useful complement to any skincare regimen, offering subtle moisture and delivering strong active ingredients to help enhance the general health and appearance of the skin. Water-based

serums are a popular option in skincare routines because they provide several benefits. First of all, they work well on all skin types, even those with oily or acne-prone skin, thanks to their lightweight and non-greasy texture. Water-based serums are perfect for use both morning and night because they absorb into the skin quickly and leave no residue, unlike heavier oil-based formulations.^[21] The potent hydration that water-based serums offer is one of their main advantages. They usually have high concentrations of humectants, which draw moisture to the skin and aid in its moisture retention all day. Examples of humectants are glycerin and HA. Because of this, water-based serums are especially good at reducing dryness and enhancing the suppleness and elasticity of the skin. Apart from providing hydration, water-based serums frequently incorporate other advantageous components such as vitamins, antioxidants, and botanical extracts.^[22] Certain skincare issues such as dullness, uneven skin tone, fine lines, and wrinkles can be helped by these ingredients. For instance, Vitamin C, which can help brighten the complexion and shield against environmental damage, is frequently found in water-based serums.^[23] Water-based serums also have the benefit of being versatile. They do not feel heavy or cause pilling, so they can be effortlessly added to skincare routines that already exist or layered with other products. This enables people to take advantage of light hydration while tailoring their skincare routine to their specific skin concerns.^[24]

The emulsion serum

An emulsion-based face serum is a type of moisturizer that delivers high-performance ingredients to the skin and fortifies the skin's barrier function. An emulsion is made up of two "immiscible" phases – phases that do not want to mix, such as water and oil. Water and oil are bound together and kept in a stable state by the use of an emulsifier. An emulsion offers the best chance of introducing potent active ingredients deeply into the skin's tissues. Although it is extremely difficult for any cosmetic item to penetrate the dermis due to the skin's barrier function, an oil and water mixture is the most appropriate for achieving this amazing feat. The moisturizing properties of the emulsion will reinforce the skin's barrier function.^[25] Innovative skincare products are known as "emulsion serums" combine the advantages of a serum with the airy texture of an emulsion. These formulas fill the gap between moisturizing emulsions, which are lighter and more readily absorbed into the skin, and traditional serums, which are frequently highly concentrated with active ingredients. Emulsion serums' capacity to provide a well-balanced combination of hydration and active ingredients is one of their primary characteristics. Compared to traditional serums, they usually have a higher concentration of water-based ingredients, which makes them more hydrating and appropriate for a larger variety of skin types.^[26] Furthermore, moisturizing ingredients such as glycerin or HA are frequently included in emulsion serums. These ingredients help to seal in moisture and maintain the skin's hydration levels throughout the day.

Emulsion serums are hydrating, but they also have strong active ingredients that address particular skincare issues. Depending on the formulation, these could include vitamins, peptides, antioxidants, or botanical extracts.^[27] For instance, peptides can promote the formation of collagen and enhance skin firmness, while antioxidants such as Vitamin C or green tea extract help shield the skin from environmental damage and brighten the complexion.

Emulsion serums absorb easily into the skin due to their lightweight texture, leaving the skin feeling hydrated, smooth, and soft – all without leaving a greasy afterglow. Usually, they are applied before more intense moisturizers or creams but after cleansing and toning. Usually, a small amount of emulsion serum is enough, and it can be thoroughly absorbed by gently massaging it into the skin with upward motions. Emulsion serums' light texture is one of their main benefits. The skin feels hydrated, smooth, and soft after using emulsion serums; unlike thicker creams or moisturizers, they absorb quickly and leave no greasy aftertaste. Because they hydrate and nourish without feeling heavy or occlusive, this makes them, especially well-suited for use during the day.^[28]

Moreover, high concentrations of active ingredients that address particular skincare issues are frequently found in emulsion serums. Depending on the formulation, these could include peptides, vitamins, botanical extracts, or antioxidants. Emulsion serums can directly address concerns such as dullness, uneven skin tone, fine lines, and wrinkles by delivering powerful ingredients to the skin. This leaves the skin looking more youthful and radiant. The adaptability of emulsion serums is an additional benefit. They can be combined with other skincare products to form a multi-step routine or used on their own as a light moisturizer. This enables people to take advantage of the advantages of targeted treatment and hydration while tailoring their skincare regimen to their specific skin concerns. The possibility of skin irritation or sensitivity is another possible drawback of face serums, especially for people with sensitive skin or specific skin conditions. Active ingredients found in serums, such as retinoids, alpha hydroxy acids (AHAs), or Vitamin C, can result in redness, dryness, or peeling if applied improperly or if the user is sensitive to these substances. To reduce the chance of irritation, it is critical to patch-test new serums and incorporate them gradually into the skincare regimen.

Furthermore, not every skin type should use every serum. For example, people with oily or acne-prone skin may find that oil-based serums worsen their acne or congestion, and people with extremely dry skin may find that water-based serums do not hydrate their skin sufficiently.^[29]

The pressed balm serum

A balm serum contains active ingredients that are oil-soluble (lipophilic) and may benefit the skin in addition to the traditional balm base of butter, waxes, and oils. The

occlusive barrier that the butter and waxes create on the skin nourishes and hydrates it, enabling the active ingredients in the pressed serum to work. Numerous fascinating, one-of-a-kind butter and waxes can be blended with thousands of fine plant oils to create a balm serum. Redressed balm serums, which combine the concentrated efficacy of a serum with the richness of a balm, represent an inventive convergence of skincare formats. This hybrid product targets particular skincare issues and has a unique texture that melts when it comes into contact with the skin, delivering intense hydration and nourishment. Pressed balm serums frequently have an opulent, velvety texture that melts into the skin and delivers a decadent application experience.^[30] One of the main benefits of pressed balm serums is their deep moisturizing and calming properties, which are especially helpful for people with dry skin. These creams usually include a combination of nourishing oils, butter, and emollients, such as squalane, cocoa butter, or shea butter, which help to seal in moisture and restore the skin's lipid barrier. Furthermore, strong active components such as vitamins, antioxidants, or peptides may be added to pressed balm serums to target particular skincare issues such as wrinkles, fine lines, or uneven texture. The adaptability of pressed balm serums is another benefit. For people with normal to dry skin, they can be used as a stand-alone moisturizer or as a targeted treatment added to already-existing skincare routines.^[31] Pressed balm serums are generally more expensive, but because they are concentrated, you only need a small amount for each application, making them an affordable choice. In addition, pressed balm serums frequently come in handy packaging such as jars or compacts, which makes it simple to carry and apply on the go. In addition to being less likely to leak or spill than conventional liquid serums, these solid serums also minimize waste and mess. Face serums with pressed balms differ from conventional skincare products in several ways. First of all, their special formula combines the advantages of a serum and a balm to deliver concentrated treatment and intense hydration in a single handy product. Pressed balm serums have a rich, velvety texture that enables deep moisturization; this makes them, especially useful for people with dry skin. In addition, this richness fortifies the skin's protective layer, assisting in retaining moisture and preventing its loss throughout the day.^[32]

The adaptability of pressed balm face serums is an additional benefit. For people with normal to dry skin, they can be used as a stand-alone moisturizer or as a targeted treatment added to already-existing skincare routines. Pressed balm serums are generally more expensive, but because they are concentrated, you only need a small amount for each application, making them an affordable choice. Pressed balm serums are also less likely to leak or spill than traditional liquid serums due to their solid consistency, which reduces waste and mess.

To target particular skincare issues, pressed balm face serums frequently include strong active ingredients such as vitamins, antioxidants, or peptides. Over time, these components may help to enhance the texture of the skin, lessen the visibility

of wrinkles and fine lines, and encourage a more radiant complexion.^[33] Furthermore, adding a pressed balm serum to your skincare routine can be a luxurious sensory experience that enhances relaxation and self-care. Although pressed balm serums have many advantages for skincare, using them may also have some drawbacks. The possibility of pore blockage or breakouts is a major drawback, especially for people with oily or acne-prone skin. Pressed balm serums' rich, emollient texture can occasionally be too heavy for oily skin types, which could exacerbate already-existing congestion or lead to fresh breakouts. Furthermore, certain oils or butter that are frequently included in pressed balm serums may have a higher comedogenic rating than other ingredients, which increases the risk of pore blockage and acne.

Pressed balm serums may feel excessively greasy or heavy on the skin, which is another drawback, particularly in hot or muggy weather. Although the rich texture of these serums can offer intense moisture to people with dry skin, people with combination or oily skin may find it occlusive or uncomfortable.^[10] Pressed balm serums may be less appropriate for use during the day, especially when worn under makeup, due to their heaviness, which could potentially cause issues with product application and wear.

Moreover, pressed balm serum packaging which usually comes in jars or compacts can raise hygienic issues. Skin irritation or infection may eventually result from repeatedly dipping fingers or applicators into the product, which can introduce bacteria and other contaminants. Pressed balm serums, in contrast to conventional liquid serums, which are frequently packaged in airtight pumps or dropper bottles, maybe more contaminated if not handled with caution. Last but not least, pressed balm serums are typically more expensive than conventional skincare products. This could be a drawback for some people, especially those with limited funds. Pressed balm serums are more expensive because of their opulent formulation and potent active ingredients, which limits their accessibility.^[5]

AN ESSENTIAL COMPONENT OF FACE SERUMS

HA

A sugar molecule called HA is found naturally in the skin and is particularly good at hydrating dry, parched skin. HA's highly anionic properties allow it to draw in water, which causes it to swell, add volume, and support structural integrity. Our skin's structure is derived from the collagen in our dermis. The plumpness of skin is caused by natural HA, which is linked to water molecules on one side and bound to collagen on the other. Collagen and HA production in the skin declines with age. Its capacity to bind with water and hold up to 1000 times its weight in water makes it one of the most effective skin hydrators available. HA, in essence, makes the

skin more hydrated. Because of its remarkable capacity to hydrate and plump the skin, HA is a widely used component in face serums.^[18] HA is a naturally occurring substance found in the body. It is well known for its capacity to hold 1000 times its weight in water, which makes it a perfect ingredient for providing the skin with intense hydration. HA is usually formulated in different molecular weights in face serums to ensure optimal penetration and hydration at different skin levels. HA's ability to draw moisture from the air and bind it to the skin is one of its main benefits in face serums; this helps the skin stay optimally hydrated all day. This enhances the moisture content of the skin while also firming and plumping it, making wrinkles and fine lines less noticeable and encouraging a more youthful complexion. HA is also ideal for all skin types, even oily and acne-prone skin, due to its lightweight texture and quick absorption into the skin without leaving a greasy or sticky residue.^[37] HA helps to reinforce the skin's natural barrier function, which promotes general skin health in addition to its hydrating qualities. HA helps shield the skin from environmental aggressors such as pollution and UV radiation, which can cause skin damage and premature aging. It does this by strengthening the skin's moisture barrier. HA is also advantageous for people with sensitive or irritated skin because of its calming and anti-inflammatory qualities.^[17]

Vitamin C

This necessary nutrient is very important for healthy skin. It is a potent antioxidant that shields the skin from harmful free radicals brought on by stress and everyday environmental conditions. Because of its many skincare benefits, Vitamin C, also referred to as ascorbic acid, is a powerful ingredient that is frequently used in face serums. Vitamin C functions as an antioxidant to help shield the skin from free radical damage, which can cause premature aging and dullness of the skin. Vitamin C acts as an antioxidant when applied topically in the form of a serum, lowering oxidative stress and encouraging a more youthful complexion.^[4]

Brightening and leveling out skin tone is one of the main benefits of Vitamin C in face serums. Over time, Vitamin C can help fade acne scars, hyperpigmentation, and dark spots by inhibiting the production of melanin. Frequent use of Vitamin C serums can enhance overall skin tone and leave the complexion looking more radiant and luminous. Furthermore, Vitamin C increases the skin's synthesis of collagen, which enhances the elasticity and firmness of the skin. Vitamin C serums can help minimize the look of fine lines and wrinkles by encouraging the synthesis of collagen, leaving the skin looking smoother and younger. Because of its anti-aging properties, Vitamin C serums are a preferred option for people who want to prevent aging signs and keep their complexion looking younger. Moreover, Vitamin C has anti-inflammatory qualities, which makes it advantageous for people with sensitive skin or acne. Vitamin C serums can lessen the intensity of acne breakouts, speed up the

healing of blemishes, and soothe redness and irritation. Even people with sensitive skin can benefit from the regular use of Vitamin C in skincare routines because of its calming properties.^[1] To guarantee effectiveness, it is critical to select a stable formulation with the right amount of Vitamin C in serums. To prevent light and air from deteriorating the Vitamin C molecule over time, Vitamin C serums should be kept in opaque or dark-colored bottles.^[2] Overall, Vitamin C serums provide brightening, anti-aging, and soothing properties for a more youthful-looking complexion, making them a flexible and useful addition to skincare regimens. The most researched and physiologically active is L-ascorbic acid. Because the stratum corneum is hydrophobic, L-ascorbic acid has poor penetration into the skin due to its hydrophilic and unstable nature. The fact that L-ascorbic acid is a charged molecule also restricts its penetration. Enhancing the stability and permeability of ascorbic acid can be achieved by lowering its acidity to a pH of <3.5.^[9]

Retinol (Vitamin A)

One of the anti-aging ingredients with the greatest clinical proof currently on the market is retinol. In addition to firming and plumping the skin, they target any existing fine lines, sagging, or wrinkles. Tissue inhibitors of metalloproteinases are also enhanced by retinol, which also inhibits matrix metalloproteinases. Because of its exceptional capacity to encourage skin renewal and rejuvenation, retinol, a Vitamin A derivative, is a powerful ingredient in face serums and is widely used in skincare products. When retinoic acid is applied topically, it transforms from retinol and promotes the production of collagen, speeds up cell turnover, and helps lighten hyperpigmentation and dark spots. Retinol is a potent anti-aging ingredient that targets uneven skin texture, fine lines, and wrinkles because of these qualities.^[14] The ability of retinol to promote the synthesis of collagen is one of its main benefits when used in face serums. As we age, our body produces less collagen, which causes sagging and wrinkles. Collagen is a protein that gives skin structure and firmness. Retinol improves the elasticity and firmness of the skin by increasing the production of collagen, giving the complexion a smoother, younger-looking appearance. Furthermore, retinol encourages cell turnover, which accelerates the removal of dead skin cells to reveal healthier, younger skin beneath. Renowned for their ability to unclog pores, minimize the visibility of imperfections, and avert future breakouts, retinol serums are especially advantageous for people with acne or congested skin. Furthermore, by preventing the synthesis of melanin and encouraging the shed of pigmented skin cells, retinol has been demonstrated to reduce hyperpigmentation, dark spots, and sunspots. Utilizing retinol serums regularly can help balance out skin tone and enhance overall skin clarity, resulting in a complexion that appears more radiant and brighter. Retinol, for all its advantages, can irritate the skin, especially when added to a skincare regimen for the 1st time. Especially in those with sensitive skin, common side effects include redness, dryness, and peeling. Starting with a

lower concentration of retinol and gradually increasing usage over time is crucial to minimize irritation. Furthermore, maximizing benefits and minimizing potential side effects can be achieved by combining retinol serums with moisturizers and sunscreen. It increases the synthesis of collagen, which results in firmer skin. Retinol increases the number and activity of fibroblasts, which in turn stimulates them to produce collagen fibers.^[15] It also promotes angiogenesis, increases the production of elastin fibers, and improves skin elasticity by removing degenerated elastin fibers.

Salicylic acid (SA)

SA, a beta-hydroxy acid (BHA), helps to encourage the skin's natural exfoliating mechanism. It was initially made from the bark of a variety of plants, such as white willow and wintergreen leaves. Nowadays, laboratories are the most common place to produce SA.^[13] Because of its superior exfoliating and acne-fighting qualities, SA is a BHA that is frequently found in face serums. Due to the oil-soluble nature of this ingredient, excess oil, dead skin cells, and other impurities that can cause breakouts and acne can be dissolved deep within the pores. When it comes to treating acne-prone skin and common issues like blackheads, whiteheads, and blemishes, SA is especially useful. SA's ability to gently exfoliate the skin is one of its main benefits when used in face serums. SA helps to shed dead skin cells and expose smoother, younger skin beneath by breaking down the bonds holding them together. Furthermore, SA can help control the production of sebum, which is advantageous for people with oily or combination skin.^[12] SA serums are a popular option for people who struggle with oiliness and shine throughout the day because they can help mattify the appearance of the skin and reduce shine by controlling excess oil production. Despite all of its advantages, SA can cause skin irritation or drying, particularly when applied in high concentrations or by people with sensitive skin. It is crucial to begin with a lower SA concentration and progressively increase usage over time to reduce potential side effects. Furthermore, minimizing dryness and sensitivity and optimizing outcomes can be achieved by combining SA serums with moisturizers and sunscreen. SA is an excellent ingredient for people with oily, acne-prone skin, especially for helping to minimize blackheads and whiteheads.^[7] Being oil-soluble, SA can reach below the surface to remove extra sebum from pores and lessen oiliness.

AHAs

Because they can exfoliate and revitalize skin, AHAs are frequently used in face serums. These water-soluble acids mandelic, lactic, and glycolic acids, among others, work by progressively dissolving the connections that keep dead skin cells together, facilitating their shedding. By revealing smoother, more radiant skin underneath, this exfoliation procedure helps reduce the visibility of fine lines, wrinkles,

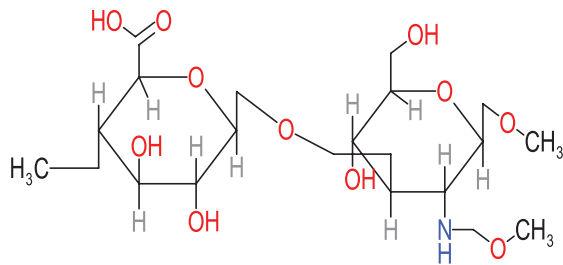


Figure 1: Hyaluronic acid

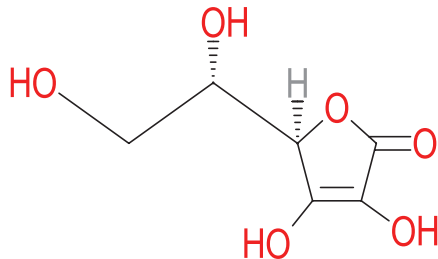


Figure 2: Ascorbic acid

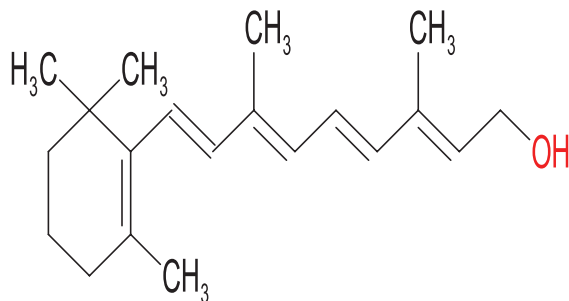


Figure 3: Retinol

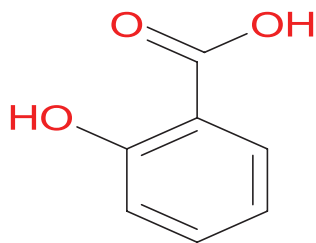


Figure 4: Salicylic acid

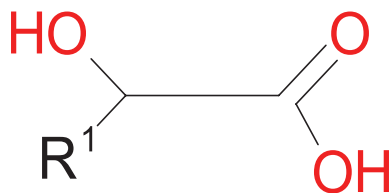


Figure 5: Alpha hydroxy acid

and uneven skin texture. One of the key advantages of AHAs in face serums is their ability to promote skin rejuvenation. By accelerating the elimination of dead skin cells and exposing healthier, younger-looking skin, AHAs help in cell turnover. In addition to promoting a more even and radiant skin tone over time, this renewal process can also help fade hyperpigmentation, sun damage, and dark spots. AHAs can also draw moisture

to the skin and aid in maintaining hydration levels because of their humectant characteristics. Due to their ability to enhance moisture retention and fend off dryness and flakiness, AHAs are especially advantageous for people with dry skin.^[3] Furthermore, by clearing the skin's surface of extra oil, grime, and debris, AHAs can aid in pore cleaning and acne prevention. AHA serums help to minimize the formation of blackheads, whiteheads, and other blemishes by maintaining clear, unclogged pores, which leaves the complexion looking more balanced and clear. AHAs have a lot of advantages, but they can also irritate skin, especially when used for the 1st time in a skincare regimen. Redness, tingling, or sensitivity are common side effects, especially in people with sensitive skin. It is crucial to begin with a lower concentration of AHA and progressively increase usage over time to reduce potential side effects [Figures 1-5].

FACE SERUM EFFECTS

Concentrates provide the skin with the required amount of active substances in a form that is easier for it to absorb right away. The concentrated active ingredients work similarly to creams in terms of moisturizing, renewing, lifting, etc. The only distinction is that when concentrates are used properly, observable results can be obtained more quickly. Apart from providing moisture, numerous face serums also have anti-aging properties. Retinol, Vitamin C, peptides, and growth factors are a few examples of ingredients that can increase the production of collagen, decrease the visibility of fine lines and wrinkles, and enhance the firmness and elasticity of the skin. These serums can help to minimize aging signs and encourage a more youthful complexion when used consistently. Another common outcome of face serums is brightening. AHAs, niacinamide, and Vitamin C are among the substances that can help reduce hyperpigmentation, dark spots, and sun damage, giving the complexion a more radiant glow and more even tone. Another important benefit of some face serums is exfoliation. AHAs, or BHAs, as well as enzymes, function to eliminate dead skin cells and clear clogged pores, leaving behind smoother, more radiant skin with fewer blackheads, whiteheads, and imperfections. In addition, a few face serums have calming and soothing properties. These serums are helpful for people with sensitive or reactive skin because of the anti-inflammatory qualities of ingredients such as niacinamide, chamomile, or *A. vera*, which can help reduce redness, irritation, and inflammation in the skin.^[18]

Based on the resultant effect, all serum is strictly classified into the following categories:

- Nourishing
- Moisturising
- Revitalizing
- Anti-inflammatory
- Anti-stress
- Smoothing.

HOW TO USE FACE SERUM

1. Cleanse your skin: Wash your face first. To get rid of any debris, oil, and pollutants from your skin, use a mild cleanser that is suitable for your skin type. Dry your skin using a fresh towel
2. Tone (optional): Use a toner only after cleansing if you use one as part of your skincare regimen. Toners can help bring the skin's pH levels back into balance and prime it for better absorption of the next skincare products
3. Apply serum: Using your fingertips, apply a pea-sized quantity of face serum. You do not need to use a lot of serum because, as you may recall, a little goes a long way
4. Apply to face: Starting in the middle of your face and working your way outward, gently pat the serum onto your skin. Be careful around the sensitive eye area and refrain from tugging or pulling at the skin
5. Massage in apply the serum to your skin using gentle, upward strokes. Concentrate on problem areas or areas where you wish to address particular skincare concerns, such as wrinkles, dark spots, or fine lines
6. Allow absorption: Before using any more skincare products, let the serum absorb completely into the skin for a few minutes. This facilitates the deep penetration and efficient operation of the active ingredients
7. Moisturize the skin: After the serum has been absorbed, apply a moisturizer to the skin to seal in moisture and provide it with additional nourishment
8. Sunscreen (daytime): Use a broad-spectrum sunscreen at the end of your skincare routine to shield your skin from damaging UV rays if you use the serum in the morning
9. Nighttime routine (optional): You can apply the serum at night instead of the sunscreen and then use any other nighttime skincare products, such as face oil or eye cream
10. The secret to great results is consistency. Use the face serum daily as part of your morning or evening skincare routine. Include it in your routine every day, or as advised by a skincare expert or dermatologist.

CONCLUSION

Those who are interested in skincare products that are mild but effective can find a natural and efficient solution in herbal face serums. By combining the potency of herbal infusions, essential oils, and botanical extracts, these serums provide the skin with a multitude of advantages. Herbal face serums address many different skincare needs, from nourishing and hydrating to relaxing and revitalizing, while lowering the possibility of negative reactions that are frequently linked to synthetic ingredients. Herbal face serums are an eco-friendly and adaptable option that offers a comprehensive skincare regimen that enhances both appearance and well-being, particularly in light of consumers' growing preference for clean and green beauty products. Herbal face serums are

a rejuvenating option for individuals wishing to cultivate healing properties from nature because of their capacity to harness those properties. Herbal face serums use plant-based ingredients and botanical extracts to revitalize and nourish the skin, providing a natural and holistic approach to skincare. These serums offer a gentle yet efficient solution for addressing a range of skincare concerns because they are enhanced with a variety of herbs recognized for their therapeutic properties. Herbal face serums are suitable for all skin types and offer a versatile range of benefits, from brightening and revitalizing to hydrating and soothing. Herbal face serums are a great way to reap the benefits of nature's bounty and improve the health and brightness of your skin. Herbal face serums are a revitalizing and invigorating treatment that can be used alone or in conjunction with other skincare products to leave your skin feeling and looking its best.

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