

Alpha Hydroxy Acid (AHA) / Beta Hydroxy Acid (BHA)

Hydroxy Acids are some of the most widely used and studied anti-aging skincare ingredients. Clinical studies have shown just how effective these ingredients are in reversing the effects of photoaging and significantly improving wrinkles, skin hydration, elasticity and tone.

At Naturopathica, we employ these powerful and effective Alpha and Beta Hydroxy Acids in our treatment products. These ingredients are used at active levels to deliver the skincare benefits supported by clinical evidence.

Background

Hydroxy acids play a major role in skin care and dermatology therapy, with their popularity continuing to rise as research into what causes wrinkles and the effects of photoaging advances. There are two types of hydroxy acids- alpha and beta.

Alpha Hydroxy Acids (AHAs)

Alpha hydroxy acids (AHAs) are naturally occurring carboxylic acids found in many foods, including glycolic acid (sugar cane), lactic acid (milk), citric acid (citrus fruits), and malic acid (apples) among others. The most commonly used alpha-hydroxy acids are glycolic and lactic acids.

AHAs act on both the epidermal and the dermal levels. When applied to the skin, AHAs stimulate the exfoliation of epidermal cells in the stratum corneum (s.c.) by interfering with the ionic bonding between these cells. This results in the sloughing off dull, rough skin and promotes cellular renewal.¹ Initially used for treatment of hyperkeratosis and other skin conditions affecting s.c. turnover, AHAs were found to promote softer, smoother skin, faded wrinkles, lightened age spots, and decreased blemishes.^{2,3} Further studies have shown AHAs to improve the s.c. barrier function, increase epidermal proliferation and thickness, and restore hydration and plumpness through an increase in hyaluronic acid.⁴

AHAs are also able to travel deeper into the dermis where they are shown to effectively reverse the signs of photoaging.⁵ Research has found AHAs to increase acid mucopolysaccharides, improve the quality of elastic fibers, increase collagen density, and increase dermal thickness. They also promote increased gene expression of collagen and hyaluronic acid in the dermis.⁶⁻⁹ These effects result in a significant improvement in wrinkles, skin hydration, and dermal mechanical properties such as skin elasticity and tone.

Clinical Studies

An early study reported 4 weeks of treatment of 12% lactic acid resulted in a 19% increase in epidermal thickness and increased amounts of glycosaminoglycans and collagen in the dermis.¹⁰ Other colleagues comparing 25% glycolic acid treatment for 6 months reported a 25% improvement in skin thickness, and significant dermal changes with increased mucopolysaccharides, collagen density, and elastin quality.⁶

Concentration of AHAs is an important element for results. Exfoliation is directly proportional to the duration of application, and higher concentrations of acids have more

potent anti-aging effects. A study comparing 5% versus 12% lactic acid found that while 5% effectively modulates epidermal changes it did not reach the dermis, whereas the 12% solution was found to influence both the epidermis and the dermis.¹¹ A study using slightly lower (8% glycolic acid) revealed a significant number of patients with improvement of some aspect of photoaging, demonstrated by decreasing sallowness, hyper-pigmentation, and roughness.¹²

Safety and Efficacy

Higher concentrations of AHAs, though more active, can have an irritating effect on the skin causing redness and inflammation. Newer formulations combine glycolic acid with an amino acid such as arginine and form a time-release system that reduces the risk of irritation without affecting glycolic acid efficacy.

The FDA has established that AHAs are safe in cosmetic products at concentrations of 10% or less, at a pH of 3.5 or greater and formulated to avoid increasing the skin's sensitivity to the sun or accompanied by directions to use sun protection daily. These can be used daily and tolerated by most except very sensitive skin types.

Stronger formulations of AHAs (concentrations up to 30% or more and a pH as low as 3.0) are safe if applied only by trained professionals. Such use should be brief, discontinuous, and followed by thorough rinsing and accompanied by directions to use sun protection daily.

It is not just the percentage of AHAs that are important, but also the pH of the formulation. AHAs are more bioavailable and work best at their native lower pH. For daily products (10% or less) optimal pH should be around 3.5- 4.0.¹³

Beta Hydroxy Acids

Beta Hydroxy Acids (BHAs), such as salicylic acid, are very similar to AHAs but are lipid-soluble instead of water-soluble. This structure allows it to penetrate into the skin through sebaceous follicles, making it appropriate for patients with oily skin and open comedones. BHAs have also been found to be less irritating to the skin than AHAs. In a recent study results showed short-term topical application of glycolic acid in a cosmetic formulation increased the sensitivity of human skin to the UV radiation, while a comparable treatment with salicylic acid did not.¹⁴ It's also worth noting that salicylic acid has anti-inflammatory activity, which may reduce irritation.

Beta hydroxy acid found in skin-care products works best in a concentration of 1% to 2% and at a pH of 3.0 to 4.0.¹⁵

Glycolic Acid

Glycolic Acid, derived from sugar cane and other sugar crops, is the smallest of AHA molecules. Once applied to the skin, glycolic acid acts on the upper layers of the epidermis, weakening the bonds that hold the dead cells together. This allows for

exfoliation of the outer skin cells revealing the underlying smoother looking skin. Helps to improve skin texture and diminish the appearance of wrinkles and hyper-pigmentation.

The benefits of AHA's are well known and include exfoliation, moisturization, reduction of fine lines and wrinkles, collagen synthesis, firming and skin lightening. A negative side effect of AHA treatments can be a stinging or burning sensation directly after product application, particularly on people with sensitive skin.

At Naturopathica, we use a patented time-release delivery system that helps to prevent irritation. Clinical studies show that this form of time released Glycolic Acid is suitable even for sensitive skin. In our complex, Glycolic Acid is bound to the amino acid, Arginine, which is responsible for the slow release of Glycolic Acid to the skin. This allows for a lower immediate concentration of the AHA, which allows for less irritation. As a result, skin irritation is virtually eliminated, which allows us to extend the benefits of AHAs to even more sensitive skin types.

Naturopathica Products containing Glycolic Acid:

Glycolic Refining Peel (Skin Renewal Gel 10%)

Glycolic Refining Peel 15% (Skin Renewal Gel 15%)

Glycolic Purifying Peel (Skin Renewal Gel 10% for Overactive Skin)

Salicylic Acid

Salicylic Acid occurs naturally in Willow Bark, Sweet Birch and other *Salix* species. It is a Beta Hydroxy Acid (BHA) which has keratolytic, anti-acne and anti-inflammatory properties. Salicylic acid peels are particularly useful for patients with oily skin and open comedones, and have been found to be less irritating than traditional glycolic peels.

Naturopathica Products containing Salicylic Acid:

Sweet Cherry Brightening Enzyme Peel

Sweet Cherry Brightening Enzyme Peel 15%

Pear Fig Polishing Enzyme Peel

Pear Fig Polishing Enzyme Peel 15%

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