Technical Data Sheet

ABS Viola Tricolor Extract PF



promotes hyaluronic acid synthesis wrinkle reduction aquaporin-3 production perfect anti-aging ingredient

BACKGROUND

Wild pansy, better known as *Viola tricolor*, is a perennial herb with characteristic tricolored flowers that was considered beneficial for diseases of the heart, hence its other name, Heartsease. It was employed as an herbal remedy for its anti-inflammatory, antipyretic, mucilaginous, demulcent and expectorant properties. *Viola tricolor* contains an active chemical, principle-violine, in addition to, flavonoids (rutin), mucilage, salicylic acid, tannin and tocopherol. Another important constituent are polysaccharides, which when utilized on the skin to boost the water retentive capacity.

SCIENCE

Typically, personal care products designated for increasing moisture act as film formers or improve barrier function. The polysaccharides from *Viola tricolor* have been shown to improve epidermal moisturization by increasing aquaporins-3 activity within the dermis. In the skin, aquaporins-3 function as the mechanism that allows water to move against the concentration gradient to where water is deficient. Improving osmotic function is a novel approach for improving skin moisture. Research studies have indicated that aquaporin-3 are involved in skin hydration, elasticity, barrier function and wound healing.

BENEFITS

ABS Viola Tricolor Extract PF may be used to increase the concentration of hyaluronic acid within the epidermis to enhance the skins' water binding properties; as well as increase the synthesis of the CD44 membrane receptor which binds hyaluronic acid in the skin. Optimal epidermal hydration can increase cellular metabolism so cells function more efficiently. By increasing cellular efficiency, certain cellular activities such as protein production also increase. Proteins such as collagen are vital to epidermal integrity. Increasing intracellular production may not only improve the skin, but also decrease the appearance of fine lines and wrinkles. **ABS Viola Tricolor Extract PF** may be utilized in a variety of skin and hair care formulations to increase epidermal hydration and improve cellular function.



Code Number: 10346PF

 INCI Name: Hydrolyzed Viola Tricolor Extract
INCI Status: Conforms
REACH Status: Complies
CAS Number: 9015-54-7
EINECS Number: 310-296-6

Origin: Botanical

Processing: GMO Free No Ethoxylation No Irradiation No Sulphonation

Additives:

Natural Antimicrobial: Leuconostoc/ Radish Root Ferment Filtrate Preservatives: None Antioxidants: None Other additives: None

Solvents Used: Water

Appearance: Clear to Slightly Hazy, Amber Liquid

Soluble/ Miscible: Water Soluble 89.25% Biodegradability

Microbial Count: <100 CFU/g, No Pathogens

Suggested Use Levels: 2.0 - 4.0% Suggested Applications:

Moisturizing, Hyaluronic Acid Synthesis, Anti-aging

Benefits of **ABS Viola Tricolor Extract PF:**

- Hyaluronic Acid Synthesis
- Acquaporin-3 Synthesis
- Moisturizing

ABS Viola Tricolor Extract PF

EFFICACY

An *in-vitro* study was conducted to assess the ability of **ABS Viola Tricolor Extract PF** to increase the prevelance of CD44 receptors. CD44 is the cellular receptor with specificity for Hyaluronic Acid. The effects of **ABS Viola Tricolor Extract PF** on the increase in the CD44 receptor were determined using the flow cytometry method on human keratinocytes. A 2% concentration of **ABS Viola Tricolor Extract PF** was observed to increase the proliferation of CD44 receptors by 43% compared to the negative control and by 7% more than the positive control. The use of **ABS Viola Tricolor Extract PF** as a means to increase the prevalence of the CD44 receptor appears to be dose dependent.



Increase in CD44 Receptors

An *in-vivo* study was conducted to evaluate the epidermal hydration activity of **ABS Viola Tricolor Extract PF** when applied to a participant's skin. **ABS Viola Tricolor Extract PF** was evaluated at 2.0% in a base lotion compared to a control lotion alone. Measurements of epidermal hydration were taken with a Corneometer after a single application to the calf regions on the subject's legs. The results indicate that **ABS Viola Tricolor Extract PF** may be used to increase the level of epidermal hydration over the course of 24 hours. Compared to the placebo, **ABS Viola Tricolor Extract PF** may increase epidermal hydration by more than 10%.

In addition, we evaluated the long term hydration of this product over a period of 28 days. The results indicate that **ABS Viola Tricolor Extract PF** may be used to effectively hydrate the epidermis for an extended length of time. Compared to the placebo, **ABS Viola Tricolor Extract PF** is capable of hydrating the skin by more than 10% after a period of 14 days, and almost 20% over the period of 28 days.



Increase in Hydration



Figure 1. Results of the increase in CD44 receptors following treatment with test materials.

ABS Viola Tricolor Extract PF





Figure 3. Results of long term hydration study after 14 and 28 days.

An *in-vitro* study was performed to evaluate the ability of **ABS Viola Tricolor Extract PF** to increase the percent concentration of hyaluronic acid. Hyaluronic acid is capable of improving epidermal elasticity by maintaining the water content of the intercellular matrix of epidermal tissue. Although most believe that the presence of hyaluronic acid is limited to the body's joints, it is actually found throughout the body with a surprisingly high concentration in subcutaneous tissue. It is suspected that the viscous hyaluronic acid acts as a natural guard against subcutaneous desiccation. An ELISA assay was used to measure the synthesis of Hyaluronic acid by cultures of human keratinocytes. The assay is based on the specificity of hyaluronic acid to a hyaluronic acid-binding protein. The results indicated that **ABS Viola Tricolor Extract PF** is capable of increasing the percent concentration ofhyaluronic acid by approximately 42%. Therefore **ABS Viola Tricolor Extract PF** may be useful for retaining epidermal moisture.



Hyaluronic Acid Production



ABS Viola Tricolor Extract PF



An in-vivo study was conducted to assess the ability of ABS Viola Tricolor Extract PF to reduce wrinkles on the skin. The anti-wrinkle effects of ABS Viola Tricolor Extract PF were examined using a panel of 25 female subjects. Silicone mold replicas of test subjects' outer eye area were used to determine a decrease in total wrinkle surface, total wrinkle length and total number of wrinkles. The results indicate that using 2% ABS Viola Tricolor Extract **PF** in a base lotion, twice daily for 28 days is effective for decreasing the number of wrinkles presents in the outer eye area while also minimizing the total wrinkle surface and wrinkle length.



Mean Changes in Wrinkle Characteristics

An in-vitro study was conducted to evaluate the ability of ABS Viola Tricolor Extract PF to increase the production of aquaporin-3 synthesis. Aquaporins-3 is synthesized by human keratinocytes as a means to enhance moisture of the skin by increasing osmosis between the dermis and the strateum corneum. ABS Viola Tricolor Extract PF is capable of improving the production of Aguaporins-3, thus effective at increasing eipdermal hydration.



Aquaporin-3 Synthesis

Figure 6. Results of the increase in Aquaporin-3 synthesis following application of the test materials.



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Figure 5. Mean changes in wrinkle characteristics utilizing 2.0% ABS Viola Tricolor Extract PF.