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DavosLife Tocotrienols: Proven deep skin-depigmenting and sun protective mechanism beyond antioxidation

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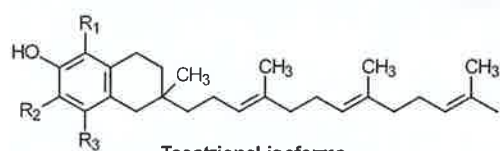
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The skin care industry, in particular the skin-whitening and anti-ageing segments, is constantly searching for powerful ingredients to meet the evolving demands of its consumers. Tocotrienol is fast gaining the worldwide attention of consumers and multinational players in the skin care industry because of its strong antioxidation and unique skin protection capabilities.

TOCOTRIENOL – NATURALLY POWERFUL ANTIOXIDANT

Tocotrienol is scientifically proven to be a powerful antioxidant derived from natural plant sources such as the oil palm (*Elaeis guineensis*). It exhibits



Tocotrienol isoforms

α: R₁=CH₃ R₂=CH₃ R₃=CH₃ β: R₁=CH₃ R₂=H R₃=CH₃

γ: R₁=H R₂=CH₃ R₃=CH₃ δ: R₁=H R₂=H R₃=CH₃

Figure 1 – Chemical structure of tocotrienols.

up to 60 times more superior antioxidant activity compared to the standard vitamin E tocopherol (1). In addition to being a powerful lipid-soluble antioxidant, tocotrienol's distinct chemical structure (Figure 1) enables its cellular uptake in biological systems by up to 70 times higher than tocopherol (2). In animal models, tocotrienol is 15 times more likely to be distributed in the skin than is tocopherol (3).

TOCOTRIENOL-ACTION BEYOND ANTIOXIDATION

Tocotrienol is non-skin irritant, non-mutagenic and is ready for incorporation in cosmetics and personal care products. In 2010, it was granted Generally Regarded As Safe (GRAS) status by the US FDA.

TOCOTRIENOL – NATURAL SKIN CARE BENEFITS

Skin Depigmentation

Tocotrienol possesses anti-melanin activity suggesting its role in skin depigmentation. As published

Melanin content on day 9 after treatment with Natural e³, sodium lactate and kojic acid

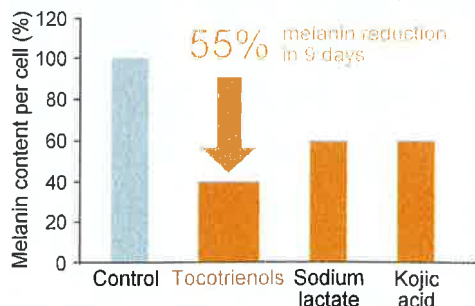


Figure 2 – Reduced melanin synthesis (5).

in the leading *Pigment Cell & Melanoma Research*, DavosLife research showed tocotrienol's ability to promote skin depigmentation through inhibition of the key protein tyrosinase in melanin synthesis. In the study, tocotrienols reduce melanin production by 55% (Figures 2) through tyrosinase inhibition that is up to 150 times more potent as compared to other skin-depigmenting agents (5).

Sun Care Protection (Photoprotection)

Due to ultraviolet (UV) radiation which is found in sunlight, excessive and prolonged sun exposure can indirectly cause severe skin damage through increased production of free radicals (7). As excellent antioxidants with a radical skin factor (RSF) of 4.15, tocotrienols provide sun protection by dramatically reducing the amount of UV-induced free radicals in the skin by up to 76% (8). Moreover, to further demonstrate its superior photoprotective activity, tocotrienol enhances the skin's built-in antioxidant capacity by up to 150% (8).

Anti-Skin Ageing

Antioxidants either applied topically or taken as food supplements have been used to prevent, delay and treat the early signs of skin ageing caused by oxidative stress (9). Excellent antioxidant properties of up to 60 times greater than tocopherol, confer tocotrienol the ability to help protect the skin from photoageing and sun-induced skin damage (1).

Skin Hydration and Skin Repair

Either singly or in combination with other ingredients, tocotrienol helps maintain skin hydration by decreasing TransEpidermal Water Loss (TEWL) and strengthening the skin's barrier function (8). Interestingly, a separate test demonstrated that tocotrienols trigger the movement of cells called fibroblasts suggesting their potential role in wound healing and skin repair (8).

TOCOTRIENOLS – ANTI-SKIN CANCER MECHANISMS

In addition to its ability to penetrate the skin's deepest layers and neutralize the damaging effects of UV-induced free radicals, tocotrienol acts on key proteins within skin cancer (melanoma) cells to induce cell death to help prevent cancer growth. Moreover, tocotrienol when given in combination with an anti-cancer agent enhances the response of melanoma cells to the drug (10).

DAVOSLIFE NATURAL e³ – DERIVED FROM NATURE, DRIVEN BY SCIENCE

In response to a growing body of evidence on tocotrienol's role in the skin care market, DavosLife produces Natural e³, a balanced blend of tocotrienol-rich complex extracted using state-of-the-art technology from GMO-free palm fruits traceable to its parent company's plantations. It has the world's largest manufacturing facility and R&D centre dedicated to the production and research of tocotrienols and supplies the world's highest purity palm tocotrienols of up to 97% purity for various isomer grades. For its commitment in advancing tocotrienol research, DavosLife is a distinguished recipient of the 2010 Asia Pacific Frost & Sullivan Excellence Award in the Vitamin E Market.

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Davos Life Science (DavosLife) was established in 2004 as the world's largest tocotrienol manufacturer and research company. Currently, DavosLife Tocotrienols are sold to leading international nutraceutical and cosmeceutical finished product manufacturers under the brand name, Natural e³.

For further information please visit www.davoslife.com

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