Arctic berry seed oils

Beauty **from within**

Berry seed oils rich in essential fatty acids, natural antioxidants and vitamins as well as plant sterols are nature's offer for a targeted oral supplementation of bioactive components enhancing the beauty of the skin from within, as Dr. Baoru Yang , Research and Development Manager of Aromtech explains.

The unique composition of the oils extracted from arctic berry species perfectly meets the needs of human skin

Linoleic and α-Linolenic acids are essential fatty acids (EFA), which need to be acquired through diet to maintain a healthy human body. Insufficient, unbalanced intake of EFA, as well as deficiency in EFA metabolism result in dry, sensitive and easily inflamed skin. Linoleic acid is an essential component of skin ceramides, a key group of compounds in the skin's lipid barrier structure. Replacing linoleic acid with other fatty acids, e.g. oleic acid, in skin ceramides leads to an increased permeability, sensitivity, and dryness of the skin. Linoleic acid is the precursor of 13-hydroxyoctadecadienoic acid (13-HODE), an anti-hyperproliferative compound in the epidermis. An EFA deficiency decreases the level of 13-HODE in the epidermis, resulting in scaly skin. Linoleic and α-Linolenic acids inhibit UV-induced hyperpigmentation and reduce age-related skin spots and uneven skin tones.

A healthy diet for the skin should contain sufficient amounts of EFA with a balanced ratio between Omega 3 and Omega 6 fatty acids. Δ6-Desaturasation is the rate-limiting step in the EFA metabolism pathway. Deficiency in Δ6-desaturase is commonly found in people with atopic skin and in the elderly. γ-Linolenic acid and stearidonic acid should be added to the diet of these people to overcome the deficiency in this key step in EFA metabolism.

In order to survive temperatures as low as minus 50°C, the arctic berry species have developed a highly unsaturated lipid profile. Seed oils from arctic berries are enriched with linoleic and α-Linolenic acids, the two essential fatty acids together constituting up to 90 % of the total fatty acids. In addition to the two essential fatty acids, oil from berries such as blackcurrant also contains γ-Linolenic and stearidonic acid, two fatty acids overcoming the Δ6-desaturation step in EFA metabolism and known for their anti-inflammatory properties. The special fatty acid composition makes arctic berry seed oils a valuable source of EFAs for both internal and external care of the skin.

Tocopherols and tocotrienols are the major lipid-soluble antioxidants in cell membranes. Four tocopherols and four tocotrienols exist in nature. α-Tocopherol from both synthetic and natural sources has been the major antioxidant in food. In dietary supplementation natural α-tocopherol has a higher bioavailability than synthetic α-tocopherol. Tocotrienols have superior mobility in cell membranes and are often more potent radical scavengers than α-tocopherol. γ-Tocopherol is very efficient in scavenging reactive nitrogen-containing molecules. Synergy between different isomers of tocopherols and tocotrienols may present far more protection of cellular components from oxidation stress than any single isomer.

The skin probably needs γ-tocopherol more than other tissues in the body. While most skin care products have included α-tocopherol as an antioxidant, γ-tocopherol has been largely neglected.

Peroxynitrite is produced during UV-irradiation and inflammation. Nitric oxide, nitrogen dioxide and nitrous acid are present in the air due to pollution. These reactive nitrogen species

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are potent oxidants and mutagenic agents that cause damage to the DNA. γ-Tocopherol efficiently deactivates these harmful nitrogen molecules by forming stable 5-nitro-γ-tocopherol. Compared with γ-tocopherol, α-tocopherol is much less efficient in quenching reactive nitrogen molecules.

The latest research evidence suggests that γ-tocopherol has great potential in reducing inflammation. In addition to topical application, oral supplementation effectively supplies the skin with natural γ-tocopherol.

Raspberry seed oil contains the highest level of γ-tocopherol among the berry seed oils. Cloudberry seed oil, blackcurrant seed oil and strawberry seed oil are also excellent sources of γ-tocopherol. These oils are excellent active ingredients for oral skin care products, protecting the skin from air pollution and UV radiation.

Tocotrienols have higher efficiency in radical scavenging and in the regeneration of themselves by other antioxidants and are thus more potent antioxidants compared to tocopherols. Under specific conditions, α-tocotrienol was up to 60 times more effective than α-tocopherol in inhibiting lipid peroxidation in microsomal membranes.

Cranberry seed oil and lingonberry seed oil contain as much as 0.18 % γ-tocotrienol, being the richest natural sources of this unique antioxidant. Bilberry is also rich in γ-tocotrienol.

Both the seed oil and pulp oil from sea buckthorn berries contain all the natural isomers of tocopherols and tocotrienols. α-Tocopherol is the major isomer in the pulp oil, whereas the seed oil contains almost equal levels of α- and γ-tocopherols. Sea buckthorn seed oil and pulp oil are also rich in natural carotenoids, a group of antioxidants working synergistically with tocopherols and tocotrienols by quenching oxygen and scavenging oxygen containing free radicals. The unique combination of multiple natural antioxidants provides the skin with a synergistic protection against oxidation induced by UV, stress and ageing. The antioxidative, anti-inflammatory and tissue regenerating effects of sea buckthorn oils have been proven by extensive studies.

Human intervention studies

An oral supplementation for four months of capsules of supercritical CO_2-extracted sea buckthorn seed oil and pulp oil produced by Aromtech improved the conditions of atopic skin. The oil supplementations also led to increases in the proportion of essential fatty acids in the plasma of the atopic subjects. Seed oil supplementation increased the level of α-linolenic acid in plasma phospholipids. The level of eicosapentaenoic acid, a metabolite of α-linolenic acid, was also increased in the plasma lipids of patients, suggesting active conversion of α-linolenic acid to longer chain, more unsaturated PUFAs. The symptom improvement in the seed oil group was positively correlated with the changes in the fatty acid profile of the plasma lipids.

BC634, a standardized blackcurrant seed oil, contains Omega 3 and 6 fatty acids at a ratio of 1 to 4 including α-linolenic, stearidonic, linoleic and γ-linolenic acids. Dietary supplementation of BC634 increased the level of dihomo γ-linolenic acid in plasma lipids, indicating anti-inflammatory potential of the oil. In addition, supplementation of blackcurrant seed oil BC634 resulted in a significant decrease in serum LDL cholesterol level compared with fish oil. These results clearly demonstrated the beneficial effects of BC634 on the health of the skin and the general well-being of the human body.

The full article, references as well as product information on the oils described can be found on the Internet – see Internet button

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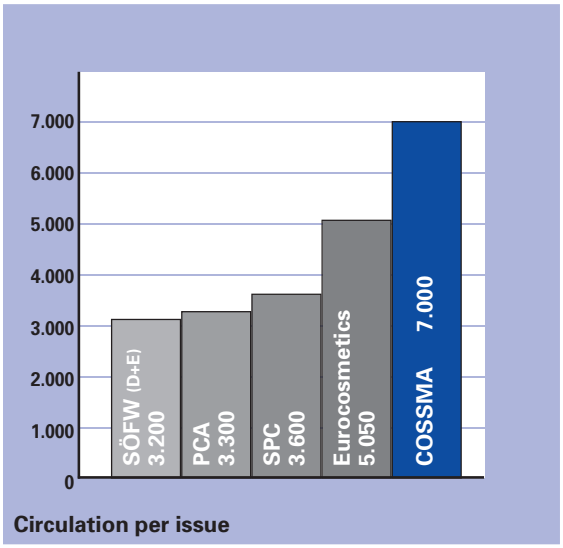

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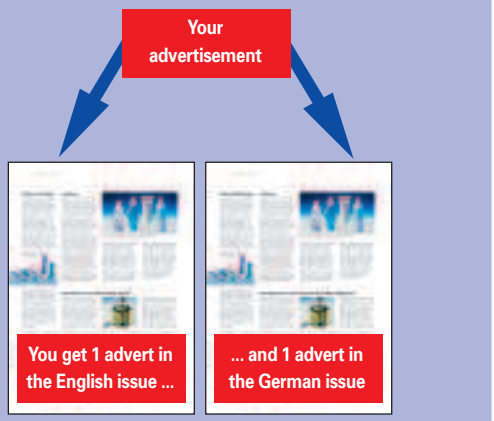

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