

This scientific information is intended for healthcare professionals.

## **Omega-7/9 + Hyaluronic acid + B vitamins + SOD + Astaxanthin + Minerals**

### **Applications and recommended use**

Inner cosmetic (skin and hair care), support for healthy mucous membranes, cardiovascular support, stress relief.

### **Typical indications for seabuckthorn oil:**

- Atopic dermatitis
- Dry eyes (e.g. contact lens wearers)
- Supportive management of gastric ulcers
- Supportive care in chronic vaginal inflammation

### **Typical indications for oral hyaluronic acid with seabuckthorn oil, astaxanthin and zinc + vit. B<sub>2</sub> + biotin + SOD:**

- Dry skin, fine wrinkles (anti-aging, UV-protection)
- Supporting skin integrity

### **Typical indications for zinc + biotin + copper:**

- When losing clumps of hair
- Supporting hair integrity and hair colour

### **Typical indications for hydroxytyrosol from olives with seabuckthorn oil, astaxanthin and folic acid + vit. B<sub>6</sub> + vit. B<sub>12</sub>:**

- Atherosclerosis prevention
- Prevention of LDL-cholesterol oxidation
- Dyslipidaemia
- Hyperhomocysteinemia

### **Typical indications for SOD:**

Symptoms of stress and fatigue (sleeping problems, irritability, loss of concentration)  
Anti-aging (primary antioxidant)

## Interactions and precautions

No side effects are known when is used correctly. Do not use during pregnancy and lactation.

## Scientific information

### **Inner cosmetic: skin care**

**Seabuckthorn pulp oil** (*Hippophae rhamnoides*) is rich in both the omega-7 fatty acid palmitoleic acid (22-33%) and the omega-9 fatty acid oleic acid (10-28%). Aged skin contains less of these monounsaturated fatty acids as compared to young skin, which is the reason why an extra supply might be beneficial for the elderly.<sup>1</sup> Free fatty acids such as palmitoleic acid are vital components of the skin's lipid barrier, and contribute to pH level, moisture regulation and suppleness.<sup>2,3</sup> Seabuckthorn oil's beneficial effects on the skin are also partly due to its content of carotenoids (e.g. beta-carotene) and phytosterols (e.g. sitosterol with anti-inflammatory potential). Patients with atopic dermatitis experienced symptom improvements after 4 months of oral application of seabuckthorn oil.<sup>4</sup>

**Hyaluronic acid** is a glycosaminoglycan (GAG) and important component of the extracellular matrix. Half of the body's hyaluronic acid content is located in the skin where it contributes to proper skin hydration.<sup>5</sup> The hyaluronic acid derived from biofermentation (and with a MW of 300 kd) was tested for 6 weeks in 61 women (aged 35-60 years) suffering from dry skin. As soon as 3 weeks after daily oral use this hyaluronic acid (120 mg/day) had induced significant increases in the moisture content measured in the stratum corneum of the right cheek, even compared to placebo. After 6 weeks of daily use the facial skin of participants in the hyaluronic acid group showed improved lustre and suppleness and less fine wrinkles than those in the placebo groups.<sup>6</sup>

**Zinc, vitamin B<sub>2</sub> and biotin** have physiological roles in the maintenance of a healthy skin. Zinc shortage may induce skin rash and impaired wound healing.<sup>7</sup> Vitamin B<sub>2</sub> deficiency is associated with skin lesions, probably due to reduced maturation of skin collagen.<sup>8</sup> Biotin shortage induces a scaly, red skin due to impaired fatty acid metabolism.<sup>9</sup>

**Superoxide dismutase (SOD)** is active as an antioxidant at sites in the body where oxygen radicals arise, which happens in all cells because 3-10% of the oxygen that is needed in cellular energy production escapes as oxygen radicals. Since an oxygen radical is a direct descendent of the oxygen molecule it is called a primary radical. If oxygen radicals do not get neutralised they will damage all cell structures (DNA, fatty acids, proteins, ...). Then, these cell structures consequently become free radicals themselves (e.g. lipid radicals in the case of fatty acids), and induce a chain reaction of free radical formation that further damages the tissues (e.g. drastic tissue aging). Since SOD offers protection at a very early stage (i.e. at the development of a primary oxygen radical), this enzyme is also called a primary antioxidant. As a primary antioxidant SOD combats skin aging, since skin is often exposed to oxygen radicals (e.g. in contact with UV radiation, ozone, detergents, cigarette smoke). SOD neutralises the superoxide radical ( $O_2^-$ ), and works very well with catalase and glutathione peroxidase in order to also disable the hydrogen peroxide radical ( $H_2O_2$ ). Therefore, it

is interesting that the SOD of Extramel® quality also contains catalase ( $\pm 15.5$  IE/mg) and glutathione peroxidase ( $\pm 1.55$  IE/mg), next to SOD (140 IE/mg guaranteed).<sup>30</sup>

**Astaxanthin** promotes the production of collagen by skin fibroblast and protects the skin against UV radiation.<sup>10,12</sup> These effects help to explain the cosmetic benefits that are shown in clinical studies after 8-12 weeks of supplementation with 2 to 6 mg astaxanthin per day: better hydration of the skin, improvement in skin elasticity and reduction of crow's feet.<sup>11,12</sup>

#### **Inner cosmetic: hair care**

**Zinc, biotin and copper** have physiological roles in the maintenance of healthy hair. Zinc shortage may lead to patchy hair loss and hypopigmentation (the hair acquires a reddish hue).<sup>13</sup> Biotin deficiency induces a thinning of the hair and eventually leads to hair loss.<sup>14</sup> Copper is needed for the synthesis of melanin in both skin and hair, as component of the enzyme tyrosinase (which action is considered the rate limiting step in melanogenesis).<sup>15</sup>

#### **Dry, irritated mucous membranes**

**Seabuckthorn pulp oil** has the potential to support the integrity of mucous membranes. Preclinical research and preliminary human studies showed beneficial effects in the relieve of gastric ulcers (supporting the gastric mucosa),<sup>16,17</sup> in chronic vaginal inflammation (support for dryness of the vaginal mucosa)<sup>16</sup> and in the treatment of dry eyes (supporting the eye mucosa).<sup>18,19</sup>

#### **Cardiovascular health**

**Extra virgin olive oil** containing high amounts of polyphenols such as **hydroxytyrosol** protects against the oxidation of LDL cholesterol. Studies demonstrated significant protections with daily use of 9.15-14.6 mg total polyphenols and 5-10 mg hydroxytyrosol (corresponding to the hydroxytyrosol content of 3 to 6 olives).<sup>20-22</sup> Hydroxytyrosol is a powerful antioxidant and mild inhibitor of platelet aggregation, with potential in atherosclerosis prevention.<sup>23,24</sup>

**Astaxanthin** also offers cardiovascular benefits. It is a powerful antioxidant and anti-inflammatory agent.<sup>31</sup> In patients (n = 61) with mild hypertriglyceridemia (TG up to 200 mg/dl) supplementation with astaxanthin (6 mg/day) induced a significant 10% increase in HDL cholesterol after 12 weeks of use.<sup>32</sup> A trial in football players (n = 40) showed that a 3 months' supplementation with astaxanthin (4 mg/day) increased paraoxonase 1 activity significantly. Paraoxonase is the antioxidant enzyme present on HDL cholesterol particles that protect LDL cholesterol particles against oxidation.<sup>33</sup>

In a placebo-controlled trial isolated **palmitoleic acid (the omega-7 fatty acid from seabuckthorn oil)** at 220 mg/day had a positive effect on the lipid profile of adults with dyslipidaemia. CRP, triglyceride and LDL cholesterol levels reduced with 44%, 15% and 8% respectively in the treatment group as compared to the control group.<sup>25</sup>

**Folic acid with the vitamins B<sub>6</sub> and B<sub>12</sub>** is a perfect combination to reduce elevated levels of homocysteine. Hyperhomocysteinemia (fasting homocysteine > 15 mmol/L in plasma) is an independent risk factor for cardiovascular diseases.<sup>26,27</sup> Methylcobalamin is the chemical form of vitamin B<sub>12</sub> that actively participates to homocysteine metabolism (conversion of homocysteine to methionine). This conversion simultaneously requires active folic acid, as the chemical form 5-methyltetrahydrofolate (e.g. directly ingested as the calcium salt in the form of calcium-L-methylfolate = calcium-5-methyltetrahydrofolate).<sup>28</sup>

### **Stress relief**

Two placebo controlled clinical studies in 131 healthy volunteers showed that the SOD of Extramel® quality induced a reduction in the experience of everyday stress and fatigue. The participants to these studies had an active professional life and used either placebo or 10 mg SOD (140 IU) per day for 4 weeks. SOD supplementation significantly reduced perceived stress and fatigue symptoms, such as pain, sleep troubles, loss of concentration and irritability.<sup>29,30</sup>

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