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Astashine Silver Capsules: An Excellent Choice to Maintain Healthy Skin

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ABSTRACT

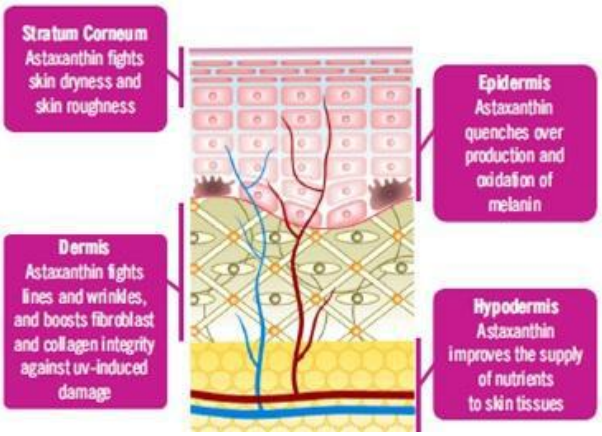
Excessive exposure of unprotected skin to sunlight results in sunburn and can also lead to photo-induced oxidation, inflammation, immunosuppression, aging and even carcinogenesis of skin cells. Pre-clinical studies show that typical dietary antioxidant, could reduce such damages. Astaxanthin is believed to protect the skin against UV-light photo-oxidation and the in vitro protective effect of astaxanthin against UV-induced photooxidation was stronger when compared with β-carotene and lutein. These findings suggest that astaxanthin has an excellent potential as an oral sun-protectant. L-Carnitine is Traditionally used as a nutritional supplement in applications such as Weight management programs, Promotion of heart health as well as Enhancement of exercise recovery. L-Carnitine Acts at a cellular level to deliver advanced skin health appearance benefits. Several studies shown that Astaxanthin & L-Carnitine Combination in Astashine silver capsule is supportive of skin health and in particular Contributes to skin strength and elasticity and thus Promotes maintenance of effective skin barrier to maintain healthy skin hydration.

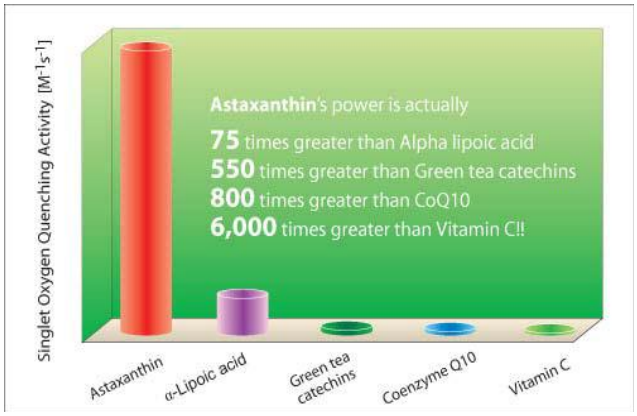
Keywords: Astashine silver capsules, skin strength, elasticity and barrier.

1. INTRODUCTION

Research has demonstrated that the antioxidant activity of astaxanthin is approximately 10 times stronger than other carotenoids tested (e.g., zeaxanthin, lutein, tunaxanthin, canthaxanthin, beta-carotene) and 100 times greater than those of vitamin E (alpha-tocopherol). This resulted in one researcher stating "astaxanthin has the properties of a 'super vitamin E. Other research has also demonstrated superior antioxidant activity of astaxanthin over carotenoids and vitamin E. It is astaxanthin's marked antioxidant activity that seems to be the primary source of its health promoting properties. These properties include improvements in cardiovascular health, diabetic nephropathy, muscle endurance, eye fatigue, H. pylori/dyspepsia, skin, fat metabolism, stress and immune function. The cosmetic effects on human skin by 4 mg per day astaxanthin supplementation were demonstrated in a single-blind, placebo-controlled study30 using 49 healthy, middle-aged American women. Based upon dermatologist's assessment and instrumental assessment at week six compares to baseline initial values, the results were more than a 50 percent reduction in fine lines and wrinkles, about a 50 percent improvement in the moisture content of skin and more than a 50 percent improvement in skin elasticity.

In addition, self-assessment of patients indicated a reduction of skin roughness by more than 40 percent. L- Carnitine Acts at a cellular level to deliver advanced skin health appearance benefits as Potential to enhance skin's cellular energy and enable faster skin cell turnover to promote the appearance of younger-looking skin. Helps to up-regulate expression of key components of the skin's extracellular matrix (ECM).L-Carnitine also Contributes to skin strength and elasticity thus Promotes maintenance of effective skin barrier to maintain healthy skin hydration, Enables inhibition of degradative skin enzymes which can destroy skin's collagen and lead to appearance of wrinkles and skin aging.





1.1 Composition of Astashine silver capsules

Astaxanthin - 2mg (Naturally derived from Haematococcus pulvialis algae extract, which is microencapsulated) and L-Carnitine L-Tartarate 368 mg.

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2. CLINICAL STUDY REPORTS ON ASTAXANTHIN IN ASTASHINE SILVER CAPSULES IN SKIN HEALTH.

Human clinical trials established the use of astaxanthin to improve visible signs of premature aging and general skin health, a double-blind placebo controlled study (Yamashita 2002) [6], showed that astaxanthin in combination with tocotrienol, (a superior form of vitamin E), improved several aspects of overall skin condition.

Eight female subjects with dry skin conditions (mean age 40 yrs) received daily doses containing 2 mg astaxanthin and 40 mg natural tocotrienols. Several types of data were collected at 2 and 4 weeks and compared to the initial baseline readings. Measurable differences were observed starting just 2 weeks after supplementation. By the 4th week, the treated subjects with dry skin characteristics exhibited the following: increased moisture levels ($p<0.05$), (Figure 1); consistent natural oils; reduction of fine wrinkles, (Figure 2).

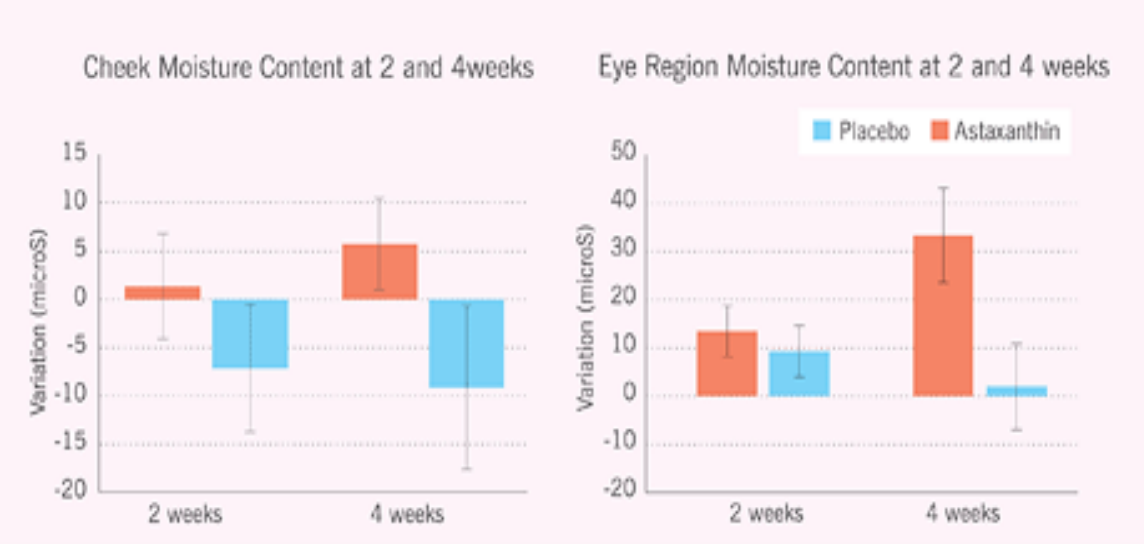

Figure 1

Figure 2

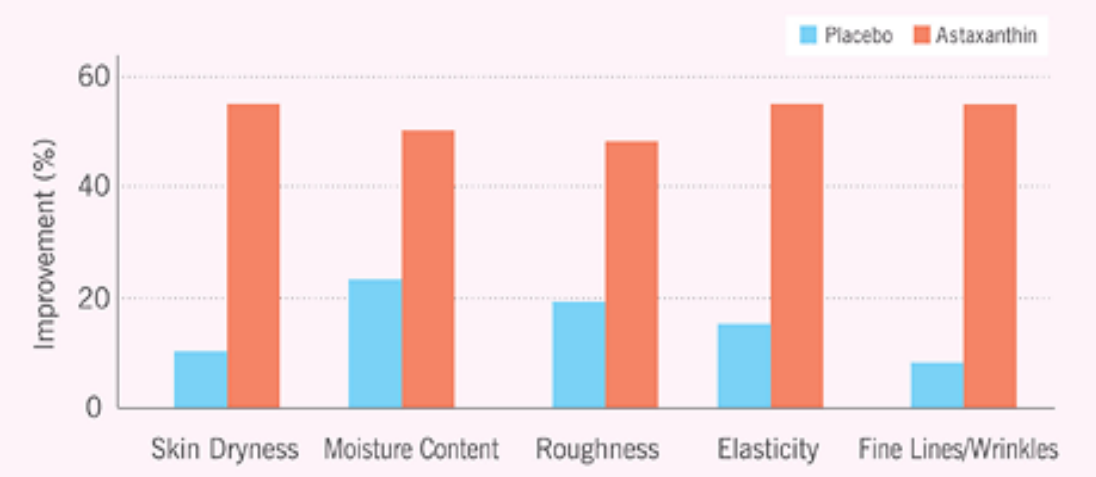

Figure 3. Subject response after 6 weeks astaxanthin supplementation

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In the second study by Yamashita (2006)[1], female subjects with a variety of skin types (n=49, mean age 47 yrs) were given either 4 mg (2 x 2 mg) astaxanthin or placebo in a single-blind, randomized, controlled study. After six weeks of consuming 4mg astaxanthin per day, the results of a standard questionnaire showed that the treated group of women all felt that their skin condition had improved significantly (Figure 3).

2.1 Skin improvements seen in all categories after astaxanthin supplementation

Instrument analysis proved that the treated group had indeed achieved positive results in hydration ($p<0.05$) and elasticity ($p<0.05$). Furthermore, a dermatologist's inspection showed wrinkle reduction ($p<0.05$) and improved elasticity ($p<0.05$) in the treated group especially between weeks 3 and 6 (Figure 4). The results were significant since skin regeneration usually takes between 4-5 weeks. The greatest improvement seen at week 6 supports the theory that astaxanthin protects and allows skin to regenerate.

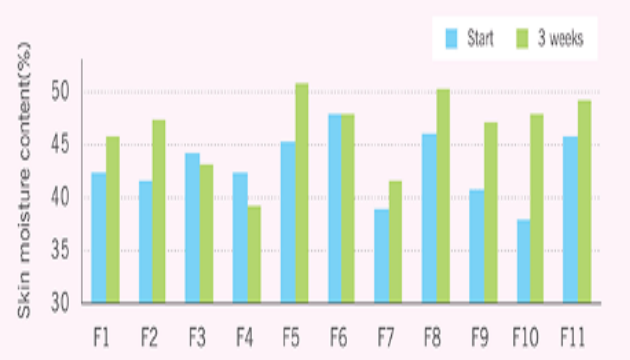

Figure 4

2.2 Astaxanthin in Astashine silver capsules Protects the Skin's Natural Antioxidant Network and DNA

Oxygen radicals formed from UV radiation attack skin cells in a variety of ways. As demonstrated by O'Connor &amp O'Brien (1998)[9], UVA light is capable of producing oxidative stress in living cells in-vitro. By monitoring catalase (CAT), superoxide dismutase (SOD) levels and thiobarbituric acid reactive substances (TBARS), Astaxanthin is capable of reducing oxidative stress ($p<0.01$, $n=6$) after UVA light irradiation at very low concentrations (5-10 nM). Astaxanthin has shown to be approximately 100-200 times more effective than other carotenoids, including lutein and beta-carotene (1.0µM).

Similar reports by Lyons et al,(2002)[5] demonstrate that UVA irradiated skin cells pre-treated with astaxanthin (10µM) suffered significantly less DNA damage. Furthermore, astaxanthin protected the skin's endogenous antioxidants SOD and glutathione (GSH) from oxygen radical attack.

2.3 Astaxanthin and Skin Cancer

The risk of skin cancer is increased in skin which is frequently damaged by the sun. Although skin cancer is almost 99% curable if detected early, 1 out of 90 people in the USA or 1 out of 150 people in the UK will develop melanomas. Those in the highest risk category are people exposed to frequent short bursts of strong sunlight. Sun screens can block the UV rays, but dietary carotenoids such as astaxanthin can be vital for skin protection as well.

In another study on hairless mice, Black (1998)[8] demonstrates that astaxanthin significantly delays the UV ray formation of skin lesions and tumours ($p<0.05$). A possible explanation is that astaxanthin is preferentially accumulated over beta-carotene and lycopene. Epidermal analysis determined that the quantity of astaxanthin was 133 times that of lycopene and 28 times that of beta-carotene.

Further support comes from Savoure et al., (1995)[10] which shows that hairless mice (SKH1) deficient in vitamin A, fed 10 mg/kg/feed astaxanthin alone or in combination with retinol, show enhanced skin protection after UVA and UVB irradiation. Astaxanthin significantly inhibited accumulation of putrescine ($p<0.05$) more than retinol and lowered spermidine and spermine.

2.4 Astaxanthin in Astashine silver capsules reduces wrinkles & increase elasticity

The UVR that affects the skin is composed of two types of waves: UVA and UVB. UVB rays are shorter than UVA rays, and are the main cause behind inflammation and melanin production. However, it is the UVA rays, with their longer wavelength, that are responsible for much of the damage associated with photoaging. UVA rays penetrate deep into the dermis, where they damage collagen fibers, leading to wrinkle formation

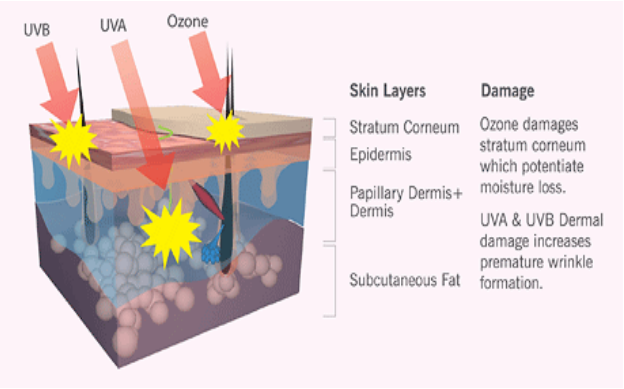

Figure 5

UV rays induce the production of in situ radical oxygen species (ROS) and matrix metalloproteinases (MMP). These factors are the root of wrinkle formation because they destroy the collagen matrix in the dermis.

Fortunately, the skin's repair mechanism will rebuild the damage collagen. However, the hindrance of skin renewal by repeated exposure to uncontrolled levels of ROS and MMP leads to the formation of wrinkles.

The presence of astaxanthin attenuates the effects of reactive oxygen and MMP and therefore, it allows the skin to regenerate properly thereby astaxanthin supports skin renewal by attenuating factors which contribute to wrinkle formation.

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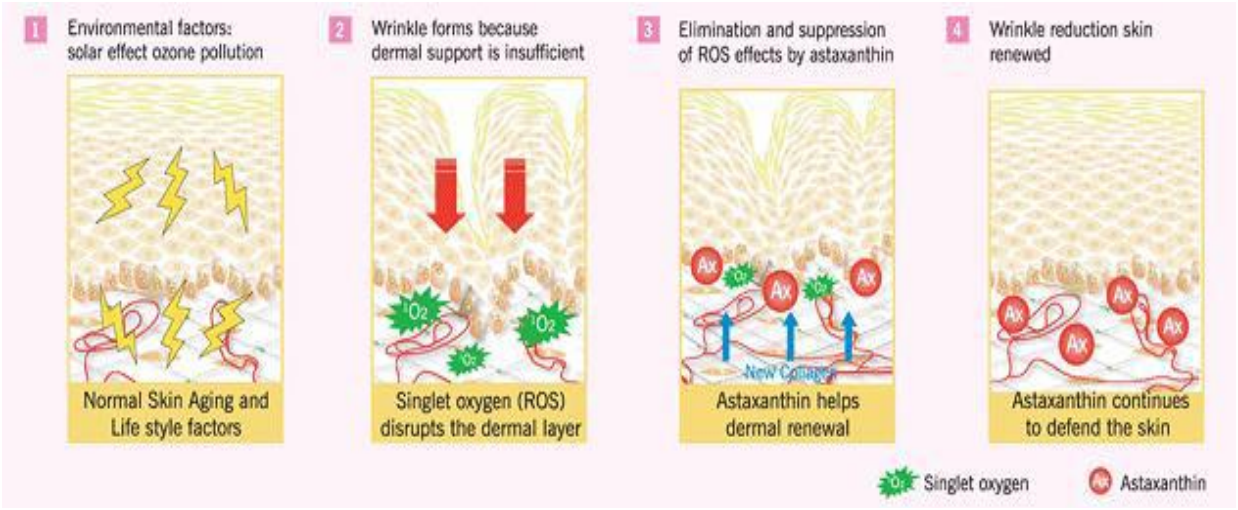

Figure 6

2.5 Astaxanthin in Astashine silver capsules defends against Reactive Oxygen Species

Oxygen present in our cells can form harmful radicals known as ROS or active oxygen when sufficient energy from UV rays is applied. ROS include singlet oxygen, superoxides and hydroxyl radicals (leading to peroxyl radicals) and they attempt to steal electrons from neighbouring molecules such as DNA, phospholipids, enzymes and protein in order to stabilize. Fortunately, astaxanthin is able to quench singlet oxygen reactions and suppress lipid peroxidation much more effectively than other well-known antioxidants and thus control the presence of ROS. In vitro singlet oxygen quenching activity of Astaxanthin was found to be superior when compared to Catechin, Vitamin C, Alpha Lipoic Acid, Coenzyme Q10, Tocopherol, Lutein and Beta Carotene [16].

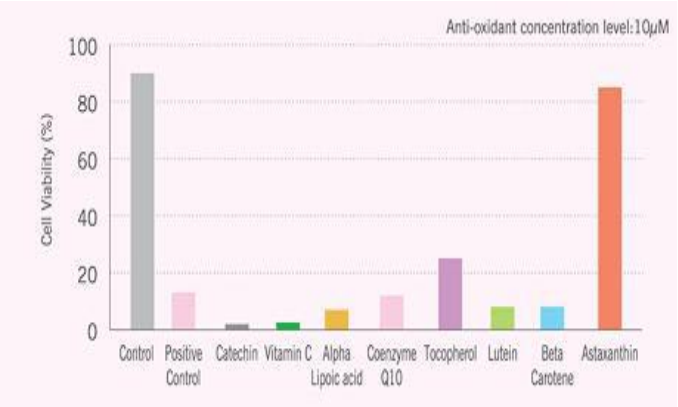

Figure 7. Study showed that astaxanthin had the highest ability to protect cells in comparison with other antioxidants.

2.6 Astaxanthin in Astashine silver capsules Vs other Antioxidants

Singlet oxygen depletes the antioxidant defense system of fibroblasts, especially CAT and SOD. Fibroblasts secrete collagen, a main component of extracellular matrix which provides structural support to the cells. Exposing fibroblasts to singlet oxygen is a widely used technique to model ageing and UV oxidative stress. Furthermore, viability of the fibroblasts remains vital to the maintenance of healthy skin appearance. Tominaga et al (2009a)[14] showed evidence on the ability of Astaxanthin to protect human dermal fibroblasts through in-vitro study. Human dermal fibroblasts were pre-incubated with Astaxanthin and other antioxidants and then exposed to singlet oxygen (Figure7). Cell viability was restored to more than 80% when the cells were treated with Astaxanthin.

In another study, Camera et al. (2008) [13] compared the photo-protective properties of astaxanthin to other antioxidants on human dermal fibroblasts. After a physiological dose of UVA was applied, roughly equal to a UV dose accumulated within 1-2 hours on a sunny day. Astaxanthin was considerably superior at preventing cell death (reduction of caspase-3 activity at protein level) compared to Canthaxanthin and Beta Carotene (Figure 8).

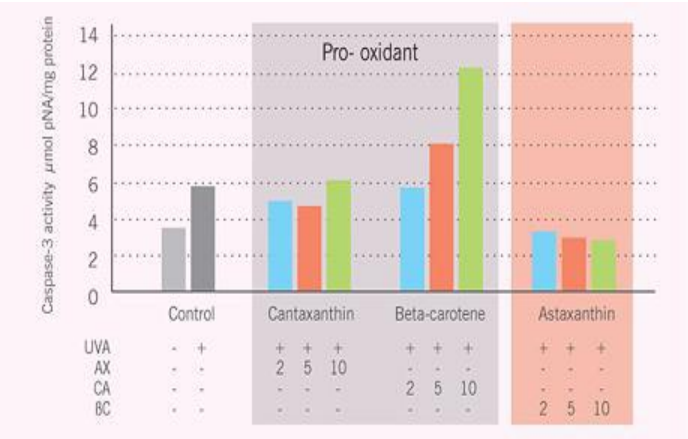

Figure 8

2.7 Astaxanthin Inner and Outer Treatment

Complementing astaxanthin oral administration with astaxanthin treatment can have enhanced synergistic effects against premature skin aging since astaxanthin is effective at all layers of skin, the skin surface, epidermis and dermis. According to studies conducted by Tominaga et al. (2009b)[15], astaxanthin treatment was found to be effective in all layers of skin. In a study with 28 subjects aged 20-55 years, astaxanthin effectively reduced wrinkles as well as improved skin elasticity. Replica analysis after 6 mg of

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astaxanthin supplementation combined with topical application for 8 weeks showed a reduction in the overall average wrinkle depth.

Furthermore, a reduction in wrinkle width by 9% ($p<0.05$) and depth by 14% ($p<0.01$) of the largest wrinkle were also observed. Astaxanthin treatment also showed significant improvement in skin elasticity ($p<0.01$) (Figure 9). These results were substantiated through in vitro studies. In vitro studies with fibroblasts pre-treated with astaxanthin (10 µM) before singlet oxygen exposure showed collagen production restored up to 80%. This evidence suggests that astaxanthin protect fibroblasts and support collagen production thereby exerting wrinkle reduction and enhancing skin elasticity.

Astaxanthin was effective in reducing skin roughness. The study showed that after 4 weeks of treatment, the mean depth of roughness significantly improved ($p<0.05$). Before and after the clinical trials, cells from the stratum corneum from the cheek area were collected by tape stripping. The cells were stained and cell area was measured and quantified by image analysis. The size of cells in the stratum corneum was found to be significantly increased ($p<0.05$). At the start of the clinical trials, signs of desquamation were extensively observed. At the end of the 8-week clinical trial, many of these cornified layer cells were healthier or showed a better arrangement.

Astaxanthin was also found effective in reducing age spot ($p<0.05$). An objective evaluation rated improvement in condition of age spot and freckles for 59% of the subjects. In vitro studies using human epidermis models, showed that astaxanthin at very low concentration (0.0006 mg/ml) inhibited melanogenesis. This inhibitory effect is superior to that induced by vitamin C (5 mg/ml) and comparable to that induced by tranexamic acid (5mg/ml) or L-cysteine (0.1 mg/ml) which are agents commonly used in dermatological therapy.

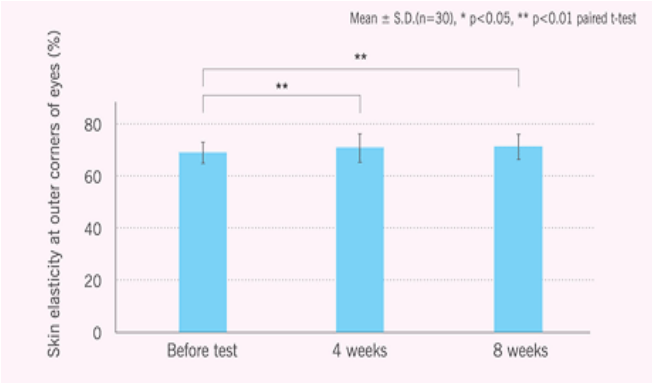

Figure 9. Effects of Astaxanthin on skin elasticity

2.8 Anti-inflammatory Action of Astaxanthin in Astashine silver capsules

Inflammation that normally follows sun exposure can be modulated by a powerful antioxidant. Yamashita (1995)[11] shows in healthy male subjects (n=7), that topical natural astaxanthin significantly reduces burn level (erythema) by 60% at 98 hours after UVB exposure that astaxanthin works by suppressing the proinflammatory mediators and cytokines via the IκB kinase dependant NF-κB activation pathway (Lee et al., 2003) [3].

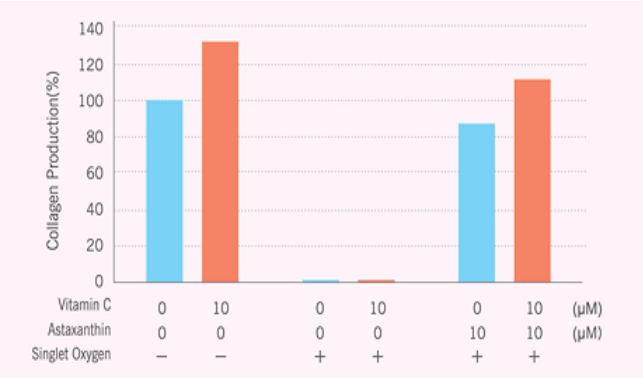

Figure 10. Stimulatory effects of Astaxanthin on collagen production and maintenance

3. CLINICAL STUDY REPORTS ON L-CARNITINE IN ASTASHINE SILVER CAPSULES IN SKIN HEALTH

Research studies indicate that L-Carnitine's role at the cellular level may also contribute benefits to the skin [17]. The enhanced level of cellular energy from beta-oxidation helps to accelerate synthesis of the new skin cells to more quickly replace the upper, older cells and reduce the renewal time of the epidermis. Skin treated with L-Carnitine shows a statistically significant decrease in the mean epidermal renewal time ($P = 0.048$) to 18.10 days vs. 20.6 days with the placebo formulation.

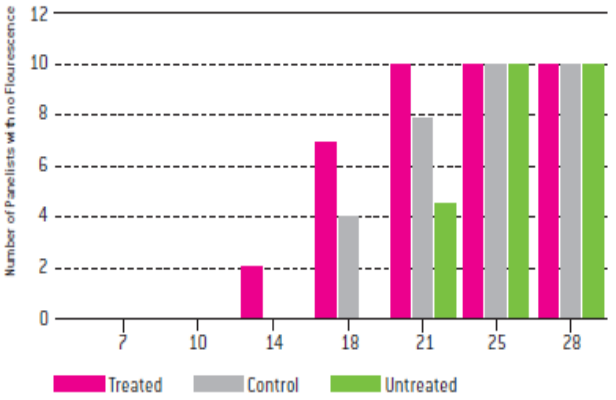

Figure 11

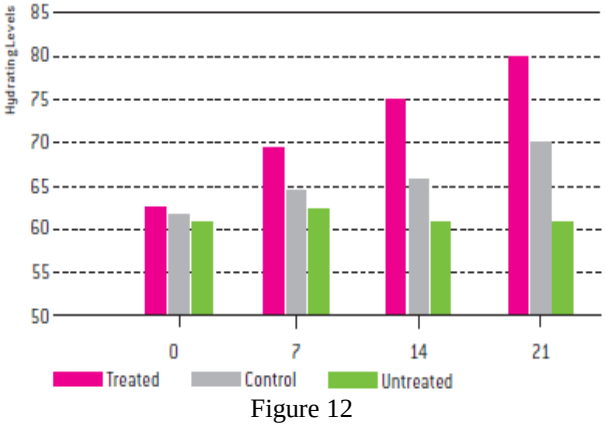

Figure 12

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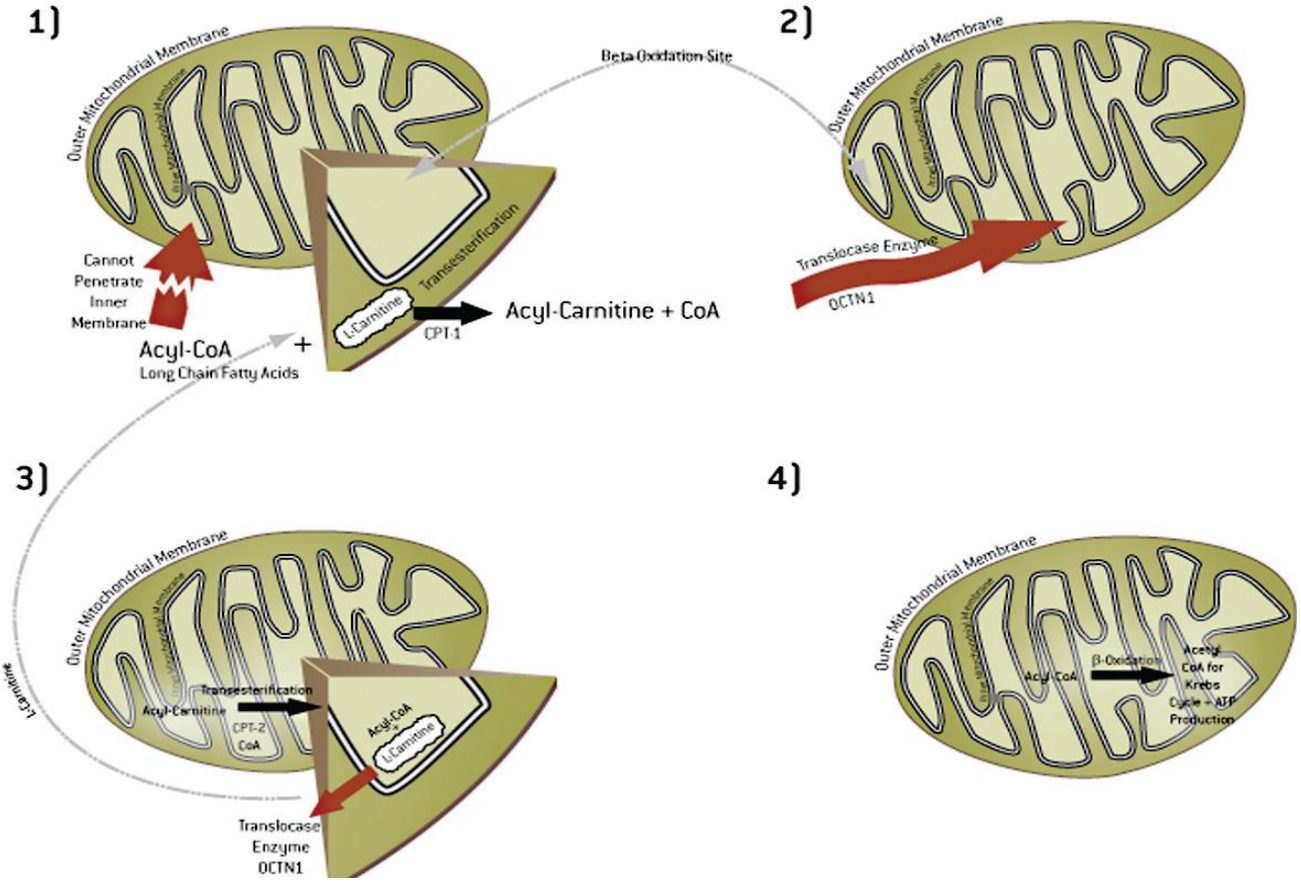

Figure 13. L-Carnitine plays a key role in beta-oxidation to enhance cellular metabolism and ultimately generate energy for skin cell functions, e.g., to be used to accelerate epidermal barrier synthesis thus Promotes inhibition of degradative skin enzymes thus Up-regulates expression of beneficial genes for key skin components

The cells of the stratum corneum, which are generated by the metabolically active corneocytes of the inner layers, work as a trap for water molecules. Skin treated with L-Carnitine shows a statistically significant increase (P = 0.002) of 26.4 % in the skin hydration vs. 12.5 % with the placebo formulation.

4. SAFETY OF ASTASHINE SILVER CAPSULES

Astaxanthin has demonstrated safety in numerous human clinical trials. In one open-label clinical study on subjects with metabolic syndrome (n=17) . Astaxanthin (16 mg/day, for three months) significantly raised blood bilirubin ($p \leq 0.05$), potassium ($p \leq 0.05$), and creatine kinase ($p \leq 0.01$), although all three values remained within normal range. Also, astaxanthin significantly lowered the liver enzyme gamma-glutamyl transpeptidase (GGTP; $p \leq 0.05$). Since the researchers noted this enzyme was abnormally elevated in 11 of the 17 subjects at baseline, this astaxanthin effect may have been beneficial.

Animal experiments have investigated astaxanthin at levels well over 120 mg/day in human equivalents, without causing apparent harm. Hoffman-La Roche confirmed its safety with extensive tests, including acute toxicity, mutagenicity, teratogenicity, embryotoxicity, and reproductive toxicity. L-carnitine is listed as pregnancy category B, indicating animal studies have revealed no harm to the fetus but that no adequate studies in pregnant women have been conducted. L-carnitine has been given to pregnant women late in pregnancy with resulting positive outcomes.The racemic mixture (D,L-carnitine) should be avoided. D-carnitine is not biologically active and might interfere with the proper utilization of the L isomer. In uremic patients, use of the racemic mixture has been correlated with myasthenia-like symptoms in some individuals.

Supplement Facts

Presentation: 60 capsules

Usage: As a food supplement combination of antioxidants to improve health and vitality.

Contra-indications: Product is contra-indicated in persons with Known hypersensitivity to any component of the product hypersensitivity to any component of the product.

Recommended usage: *Adults:* two capsules per day along with food. “Do not exceed the recommended daily dose”

Administration: Taken by oral route at any time with food.

Precautions: Food Supplements must not be used as a substitute for a varied and balanced diet and a healthy lifestyle. This Product is not intended to diagnose, treat, cure or prevent any diseases. Do not exceed the recommended daily dose.

Warnings: If you are taking any prescribed medication or has any medical conditions or have any medical conditions (seizures) under age group 17 year always consults doctor or healthcare practitioner before taking supplements.

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Side Effects: Mild side effects like nausea, headache and vomiting in some individuals have been reported.
Storage: Store in a cool, dry and dark place. Keep out of reach of children.

5. SUMMARY AND CONCLUSION

Clinically, Astashine silver capsules have shown diverse benefits, with excellent safety and tolerability. Astashine silver capsules protect the mitochondria against endogenous oxygen radicals, conserved their redox (antioxidant) capacity, and enhanced their energy production efficiency. Astashine silver capsules clinical success extends beyond protection against oxidative stress and inflammation, to demonstrable promise for slowing age-related functional decline.

REFERENCES

[1] Yamashita (2006). The Effects of a Dietary Supplement Containing Astaxanthin on Skin Condition. *Carotenoid Science*, 10:91-95.

[2] Koura(2005). Skin sensitization study of Astaxanthin in Guinea Pigs. Study No. 05035. *New Drug Research Center Inc.*, Hokkaido Japan.

[3] Lee et al., (2003). Astaxanthin Inhibits Nitric Oxide Production and Inflammatory Gene Expression by Suppressing IB Kinase-dependent NF-B Activation. *Molecules and Cells*, 16(1):97-105.

[4] Arakane (2002). Superior Skin Protection via Astaxanthin. *Carotenoid Sci.*, 5:21-24.

[5] Lyons & O'Brien et al., (2002). Modulatory effects of an algal extract containing astaxanthin on UVA-irradiated cells in culture. *Journal of Derma. Sci.*, 30(1):73-84.

[6] Yamashita (2002). Cosmetic benefit of the supplement health food combined astaxanthin and tocotrienol on human skin. *Food Style* 21, 6(6):112-117.

[7] Seki et al., (2001). Effects of astaxanthin from haematococcus pluvialis on human skin. *Fragrance J.*, 12:98-103.

[8] Black (1998). Radical Interception by carotenoids and effects on UV carcinogenesis. *Nutrition Cancer.*, 31(3):212-217.

[9] O'Connor & O'Brien (1998). Modulation of UVA light induced oxidative stress by beta-carotene, lutein and astaxanthin in cultured fibroblasts. *J. Derma. Sci.*, 16(3):226-230.

[10] Savoure et al., (1995). Vitamin A status and metabolism of cutaneous polyamines in the hairless mouse after UV irradiation: action of beta-carotene and astaxanthin. *International J Vit. and Nutr. Res.*, 65(2):79-86.

[11] Yamashita (1995). Suppression of post UVB hyperpigmentation by topical astaxanthin from krill. *Fragrance J.*, 14:180-185.

[12] Miki (1991). Biological functions and activities of animal carotenoids. *Pure & Appl. Chem.*, 63(1):141-146.

[13] Camera et al., (2009). Astaxanthin, canthaxanthin and beta carotene differently affect UVA-induced oxidative damage and expression of oxidative stress-responsive enzymes. *Experimental Dermatology.* Vol. 18 (3), Pages 222 – 231.

[14] Tominaga et al., (2009a). Protective effects of astaxanthin against single oxgyen induced damage in human dermal fibroblasts in-vitro. *Food Style* 21, 13(1):84-86.

[15] Tominaga et al., (2009b). Cosmetic effects of astaxanthin for all layers of skin. *Food Style* 21, 13(10):25-29.

[16] Nishida et al. (2007). *Carotenoid Science.* Vol.11:16-20.

[17] Holtz, R., Vitz, W., DNA Microarrays: Application to Personal Health Care and Cosmetic Industries, *Cosmetic Science Technology*, 2006.

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