

Astaxanthin-A ray of Hope

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Abstract

Astaxanthin (reddish pigment) carotenoid is a newer antioxidant which occurs naturally in certain algae and many of seafoods and possess potent cancer chemopreventive properties. It's comparatively found to be more effective than other antioxidants.³ Astaxanthin has a unique structure due to the presence of a keto and hydroxyl on each end of the molecule which contributes to the enhanced antioxidant property. It is 550 times stronger than vitamin E, and 6,000 times stronger than vitamin C. Studies have shown decreased DNA damage and enhanced immune response in human subjects consuming Astaxanthin [6,7]. the immunomodulatory, antioxidative, and anti-inflammatory and chemopreventive properties of astaxanthin, a bioactive natural supernutrient carotenoid, can cast its shadows for preventing a myriad of diseases and maintenance of optimum health in futurity [17-22].

Introduction:

Astaxanthin is a vibrant red coloured xanthophyll carotenoid naturally found in various seafood such as sockeye salmon, trout, sea bream, crabs and shrimps. *Haematococcus pluvialis*, microalgae, is the foremost and richest commercial source for natural Astaxanthin. However, it cannot be synthesized by animals and must be provided in the diet. Humans can include astaxanthin in their diet by consuming Astaxanthin containing seafood or dietary supplements, either synthetic or extracted from *Haematococcus pluvialis*.

Astaxanthin has a unique structure due to the presence of a keto and hydroxyl on each end of the molecule which contributes to the enhanced antioxidant property. It has strong free radical scavenging activity and protects against lipid peroxidation and oxidative damage of LDL-cholesterol, cell membranes, cells, and tissues. It is 550 times stronger than vitamin E, and 6,000 times stronger than vitamin C. Recent studies have shown decreased DNA damage and enhanced immune response in human subjects consuming Astaxanthin.

Conclusion:

Astaxanthin in oral carcinogenesis, premalignant lesions like leukoplakia and conditions like oral submucous fibrosis needs further investigation owing to the unique structural properties and lack of pro-oxidant activity. Dore carried out in vitro studies in humans and concluded that more research is needed on the absorption and metabolism of these promising anticancer agents and on its interaction with other carotenoids and vitamins in the human system. Astaxanthin helps immune-system mechanism by acting against free radicals. Jyonouchi, in his study on a mouse model, concluded that astaxanthin

has higher immunomodulating effects as compared to β -carotene. It is also used routinely in the treatment of diabetes mellitus and hypertension. Thus, the immunomodulatory, antioxidative, and antiinflammatory and chemopreventive properties of astaxanthin, a bioactive natural supernutrient carotenoid, can cast its shadows for preventing a myriad of diseases and maintenance of optimum health in futurity. Astaxanthin is a carotenoid widely used in salmonid and crustacean aquaculture to provide the pink color characteristic of that species. This application has been well documented for over two decades and is currently the major market driver for the pigment. Additionally, astaxanthin also plays a key role as an intermediary in reproductive processes. Synthetic astaxanthin dominates the world market but recent interest in natural sources of the pigment has increased substantially. Common sources of natural astaxanthin are the green algae *Haematococcus pluvialis*, the red yeast, *Phaffia rhodozyma*, as well as crustacean byproducts. Astaxanthin possesses an unusual antioxidant activity which has caused a surge in the nutraceutical market for the encapsulated product. Also, health benefits such as cardiovascular disease prevention, immune system boosting, bioactivity against *Helicobacter pylori*, and cataract prevention, have been associated with astaxanthin consumption. Research on the health benefits of astaxanthin is very recent and has mostly been performed in vitro or at the pre-clinical level with humans.

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