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ORIGINAL ARTICLE

Aging slower, living longer?

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Introduction

Who would not want this? That it is possible is evident in the hotspots of the long-lived: in Europe it is Crete and Sardinia, but the "world record" is found in Okinawa. On this Japanese island, centenarians are so common that they gather in clubs. One can thus conclude that it is apparently island living that promotes long life. This, in turn, may have to do with air and water, that is, clean "fresh" air enriched with activated electrons (= antioxidants) from the spray of the waves, as well as a diet that includes contents of the sea such as algae and fish.

Unfortunately, this is not granted to most of us. Thus, we are encouraged to seek nutritional supplements that have been proven to prolong life. If one looks around in the world, one finds such means. Four representatives will be presented here, they are the "**4 big A**":

Astragalus, Ashwagandha, Agaricus ABM and **Astaxanthin.**

Let's take a closer look at them.

First of all, **Astragalus:** as with all plants, there are a number of variants, one of which usually enjoys preference. It is here the Astragalus mongholicus/membranaceus, and specifically the root tuber or its extract.

Astragalus membranaceus root slices

Already in the oldest Chinese medicinal herb book, the Shennong ben cao jing, the roots of Astragalus mongholicus were given preferential treatment under the name Huáng qí (黃芪) = Yellow Guide, and a tonic effect was attributed to them (1,2) Current Chinese pharmacopoeias also recommend taking the drug for weakness, among other conditions (3). Extracts from the roots can be used successfully against allergies (4).

Astragalus is composed of the Greek words astron and gala and thus means star milk. The root is often found in the mountainous regions of China

and Mongolia. Mostly used are its roots, about two centimeters thick, harvested from the 4-year-old plant. They resemble ginger: brownish on the outside, light yellow on the inside.

The roots contain valuable ingredients: effective secondary plant compounds. These give Astragalus its reputation as an anti-aging agent. In TCM, it is also believed that astragalus strengthens qi, our life energy. In addition, the root is known as a herbal adaptogen.

Adaptogen is an alternative medical term for biologically active plant substances that help the organism to adapt to increased physical and emotional stress situations (5,6,7,8,9,10). Examples of plants or mushrooms that have such effects are ginseng, morinda citrifolia (noni), shiitake, reishi/ling-zhi, maitake, eleutherococcus, almond mushroom, schisandra, rhodiola, jiaogulan, maca, kalmegh, and cannabis CBD (11).

Adaptogens can increase stress resistance to the following factors:

- unfavorable environmental factors (external) such as cold, heat, e-smog, pollutants of all kinds

- unfavorable psychological factors (internal) such as anxiety, stress, depression

- high physical stress

Adaptogens also exert a positive effect on stress-induced diseases (12). They can curb long-term damage from e.g. long-term stress and protect cell structures. Moreover, they can improve attention span as well as mental performance, especially in the case of stress-related fatigue and exhaustion, and increase resilience.

These stress-shielding effects of adaptogens lie in maintaining the balance of various mechanisms related to psychoneuroendocrinology. These include the regulation of key mediators of the stress response, including stress-activated c-Jun N-terminal kinases (JNK), chaperones, nitric oxide, and cortisol.

Thus, a life-prolonging effect of astragalus root is unquestionably present. There are very different dosages on the market. One should go into the range of over 1 g/day.

Now about **Ashwagandha**: it comes from India, also known as Indian Ginseng. The roots contain various alkaloids such as anaferine, anahygrine, cuscohygrine, nicotine, tropine and withasomnine. Also, withanolides ("steroid lactones") such as somniferanolide, somniwithanolide, withaferin A, and withasomniferanolide. Ashwagandha roots are among the most widely used medicines in Ayurvedic medicine because of their versatile effects and very good tolerability, and can be compared to that of ginseng for Chinese medicine. They are traditionally used for age-related ailments, impotence, for inflammation, as a tonic and for insomnia.

Ashwagandha Roots and Powder

In India, ashwagandha is also used as an aphrodisiac. A potion prepared from the root is said to have a sexually stimulating effect. It is also used in tantric rituals to prolong erection. In one study, 57 men were studied over a period of 8 weeks (13). They were divided into two groups.

The intervention group received 600 mg of ashwagandha extract daily, while the placebo group received an ineffective pill. At the end of the study, strength and testosterone levels and muscle gain were measured again. The group taking ashwagandha daily had higher testosterone levels, developed more muscle mass and showed increased strength levels. In addition, an increased reduction of body fat was recorded. One should take more than 1 g/day.

Who wouldn't want these effects as they get older? Normal levels of steroid hormones cause slower aging, in part by delaying apoptosis (programmed cell death (14). It is a prejudice that the current age of death of about 80 years is intended by nature. On the contrary, nature allows 120 years if the conditions are good. And these are not a mystery. It is also a prejudice that in old age our hormones go to near zero. Every age has its normal range, which we should not go below.

About **Agaricus** blazei brasiliensis/subrufescens ABM (15): because of its high β-D-glucan content, Agaricus subrufescens is used in alternative cancer therapy, mainly in Japan and California.

Agaricus Blazei ABM from Brazil

It was traditionally used to treat many common diseases like atherosclerosis, hepatitis, hyperlipidemia, diabetes, dermatitis and cancer. In vitro and in vivo ABM has shown immunomodulatory and antimutagenic properties (16, 17, 18, 19).

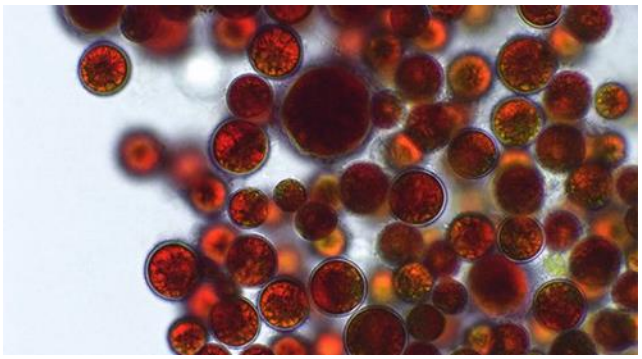
ABM glucans are side branches of a (1-6)-β-backbone as found by Dong and Ohno, who described that active fraction of β-glucans of ABM fruiting bodies had a (1-6)-β-backbone structure (or functional center) with (1-3)-β-side branches in the ratio of 1 : 2; while the linear (1,6)-β-glucan seems to be inactive. The biochemical importance of (1-3)-β-side branches has been confirmed and has shown the enhancement of the immunomodulatory activity of polysaccharides (18); and Mizuno reported an important antitumor activity linked to the water-soluble (1-6)-(1-3)-β-d-glucan.

Thus, the value of Agaricus lies primarily in its cancer preventive activity.

About **Astaxanthin**: (from Greek ἀστακός (astakós) "lobster" and "xanthin" (to Greek ξανθός (xanthós) yellowish) is a natural reddish-purple pigment belonging to the xanthophyll class of carotenoids (20). It is produced primarily by green algae or plankton and is responsible, for example, for the red coloration of crustaceans that consume these algae. The mini crustaceans (including krill) in turn serve as food for whales, salmon and flamingos. If the green algae come under stress, they produce the reddish astaxanthin instead of green chlorophyll, which ensures their survival.

Astaxanthin is considered one of the most powerful antioxidants in the world. It is a carotenoid with particularly great antioxidant and anti-inflammatory effects. Carotenoids are divided into two groups: into the carotenes and the xanthophylls. Carotenes include, for example, beta-carotene from carrots and lycopene from tomatoes. The xanthophylls include lutein and zeaxanthin (e.g. in spinach) - but also astaxanthin.

What's special about it is that astaxanthin can cross the blood-brain barrier and protect the brain and CNS nerves from inflammation and free radicals. Likewise, astaxanthin can penetrate the so-called blood-retinal barrier and provide antioxidant and anti-inflammatory protection for the eye in the retina. Astaxanthin can be distributed throughout the body, so that its protective effect benefits every cell.



The Haematococcus pluvialis alga, a source of astaxanthin.

Researchers at the University of Hawaii Cancer Center found that astaxanthin can activate the so-called longevity gene. It is called FOX03 (20). Astaxanthin can prevent all serious diseases, including dementia (21, 22). The number of positive research results is now unmanageable. One should take 8 to 12 mg/day.

Summary

Anyone who assumes or claims that aging in the current usual framework is an inevitable process to which we are at the mercy is mistaken. Nature provides us with a number of means that can slow down - in the sense of - normalize cellular aging. Of course, everyone who deals with this has their favorites. The "**4 big A**" presented here definitely belong to the top group of bioactive substances. Whoever uses them does nothing wrong. In addition to slower aging, they also prevent many different diseases.

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