International Scholars Journals

African Journal of Internal medicine ISSN 2326-7283 Vol. 9 (1), pp. 001, May, 2021.
Available online at www.internationalscholarsjournals.com © International Scholars Journals

Editorial

Antioxidants of natural plant origins

Sofia C. Lourenco*

Department of Environment, Agriculture and Food, Instituto Superior de Agronomia, Universidade de Lisboa, 1349-017 Lisboa, Portugal.

Accepted 17 May, 2021

EDITORIAL NOTE

Antioxidants are compounds that inhibit oxidation, a chemical reaction that can produce free radicals and chain reactions that may damage the cells of organisms. Antioxidants such as thiols or ascorbic acid (vitamin C) may act to inhibit these reactions. To balance oxidative stress, plants and animals maintain complex systems of overlapping antioxidants, such as glutathione. The only dietary antioxidants are vitamins A, C, and E. The term antioxidant is also used for industrial chemicals added during manufacturing to prevent oxidation in synthetic rubber, plastics, and fuels, or as preservatives in food and cosmetics. Dietary supplements marketed as antioxidants have not been shown to improve health or prevent disease in humans. Supplements of beta-carotene, vitamin A, and vitamin E have no positive effect on mortality rate or cancer risk. Additionally, supplementation with selenium or vitamin E does not reduce the risk of cardiovascular disease.

Although certain levels of antioxidant vitamins in the diet are required for good health, there is still considerable debate on whether antioxidant-rich foods or supplements have anti-disease activity. Moreover, if they are actually beneficial, it is unknown which antioxidants are health-promoting in the diet and in what amounts beyond typical dietary intake. Some authors dispute the hypothesis that antioxidant vitamins could prevent chronic diseases, and some declare that the hypothesis is unproven and misguided.

Antioxidants are classified into two broad divisions, depending on whether they are soluble in water (hydrophilic) or in lipids (lipophilic). In general, water-soluble antioxidants react with oxidants in the cell cytosol and the blood plasma, while lipid-soluble antioxidants protect cell membranes from lipid peroxidation.These compounds may be synthesized in the body or obtained from the diet. The different antioxidants are present at a wide range of concentrations in body fluids and tissues, with some such as glutathione or ubiquinone mostly present within cells, while others such as uric acid are more evenly distributed (see table below). Some antioxidants are only found in a few organisms and these compounds can be important in pathogens and can be virulence factors.

The relative importance and interactions between these different antioxidants is a very complex question, with the various antioxidant compounds and antioxidant enzyme systems having synergistic and interdependent effects on one another. The action of one antioxidant may therefore depend on the proper function of other members of the antioxidant system. The amount of protection provided by any one antioxidant will also depend on its concentration, its reactivity towards the particular reactive oxygen species being considered, and the status of the antioxidants with which it interacts. Some compounds contribute to antioxidant defense by chelating transition metals and preventing them from catalyzing the production of free radicals in the cell. Particularly important is the ability to sequester iron, which is the function of iron-binding proteins such as transferrin and ferritin. Selenium and zinc are commonly referred to as antioxidant minerals, but these chemical elements have no antioxidant action themselves, and are instead required for the activity of antioxidant enzymes. Superoxide dismutases (SODs) are a class of closely related enzymes that catalyze the breakdown of the superoxide anion into oxygen and hydrogen peroxide. SOD enzymes are present in almost all aerobic cells and in extracellular fluids. Superoxide dismutase enzymes contain metal ion cofactors that, depending on the isozyme, can be copper, zinc, manganese or iron. In humans, the copper/zinc SOD is present in the cytosol, while manganese SOD is present in the mitochondrion. There also exists a third form of SOD in extracellular fluids, which contains copper and zinc in its active sites.

*Corresponding author.Sofia C. Lourenco, E-mail: sofiaclourenco1@isa.ulisboa.pt.