

The Importance of Antioxidants with the Marine Origin in Inhibit Free Radicals

Ashraf Jazayeri

Shahid chamran university of Ahwaz

Corresponding author: jazayeriashraf@Ymail.com

Abstract: Free radicals are substances that can exist independently and At least one unpaired electron, which is why it is very active. The types of free radicals, superoxide radicals can be Hydroxyl radical, Radical Nitric Radical and nitrogen dioxide cited. In addition, oxygen free radicals produced during metabolism is also very dangerous. Most damage that free radicals in the human body include: Chemical abuse, such as carbon tetrachloride poisoning, inflammation, kill germs, the destruction of nuclear acids (DNA , RNA), Serious damage to the lungs and impaired breathing process, aging (lipid per oxidation of cell membranes) and many diseases including cancer, diabetes, arthritis, Alzheimer's and cataracts. Or antioxidant compounds are produced in the body or through Power supplies are. In fact, antioxidants, this combines with free radicals into harmless molecules in the reaction and the production and protects the body against radical damage. Antioxidants are capable of even very low concentrations, the oxidation of the material considerably oxidation can be inhibited or delayed throw. Blossoming of new technologies in recent decades due to the biological importance of marine origin has increased antioxidants. Results of research on aquatic life in many countries shows that such a potentially rich source of vital compounds, salts and minerals vitamins, essential fatty acids, anti-tumor, anti-virus and antioxidants are the most unique of its kind, or are unique. [Ashraf Jazayeri. **The Importance of Antioxidants with the Marine Origin in Inhibit Free Radicals.** *Life Sci J* 2012;9(2):1128-1132] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 167

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1. Introduction

About 361 million square kilometers (70.8%) of the total land area are covered by seas and oceans. Followed by an increase in world population and increasing food needs of the uncontrolled exploitation of marine life has been.

Plus shipping marine, oil pipelines, buried deep in the hazardous waste, drainage, water balance, and finally the giant ships discharge of wastewater, industrial and agricultural by rivers to the sea all caused extensive environmental catastrophes in the Earth's vital ecosystems has been. Including many endangered species and subsequent loss of aquatic biodiversity seas. In recent years, extensive research specialist life sciences and marine sciences, the need for greater attention to the sea and protection of marine resources has been emphasized.

However, parallel development of sciences and biological technology, once again focused the attention of researchers to the fish in most countries where consumption of marine species is not confined only to the power sector, but has pharmaceutical applications, marine of Health and extensively in is increasing. In this respect the unique characteristics of some species of marine biotechnology specialist attention Technology and Bio Marine technology was used.

Blossoming of new technologies in recent decades due to the biological importance of marine origin has increased antioxidants.

Results of research on aquatic life in many countries shows that such a potentially rich source of vital compounds, salts and minerals vitamins, essential fatty acids, anti-tumor, anti-virus and antioxidants are the most unique of its kind, or are unique.

1.1. The role and importance of antioxidant compounds:

Antioxidants, compounds that are vital in maintaining health and preventing disease are involved in some of the most important cases and the use of antioxidants, the following is noteworthy:

- A. *Protect cells*
- B. *Protect cell membranes and other lipids*
- C. *Prevention of heart disease, cardiovascular and cancer*
- D. *Prevent eye and vision disorders (cataracts and retinal disorders)*
- E. *Prevention of nervous system disorders (Parkinson)*
- F. *Delaying the aging process of cell and tissue*
- G. *The role of antihistamines in controlling and improving a Lor Zhyk diseases, asthma and ...*
- H. *Protect the body's extracellular fluid (ECF body including blood, lymph, carpeted fluids in the lungs, seminal fluid, cerebrospinal fluid and synovial fluid)*

2. Free radicals

Free radicals are substances that can exist independently least one unpaired electron, which is why very active free radicals are the most important features:

Free radicals with oxygen or carbon centers are of special biological significance.

The free radicals are very unstable and can be inorganic chemicals and organic acids and nuclear membranes, especially with key molecules to react.

A free radical, chain reactions are initiated, free radical reacts with molecules that have means to become free radicals and the chain to create a progressive damage.

The combination of free radicals to neutralize them but to deal with a free radical or free radical, a radical new arise.

Types of free radicals, superoxide radicals can be , Hydroxyl radical , Radical

Nitric Radical and nitrogen dioxide Cited. In addition, oxygen free radicals that are produced during metabolism are also very dangerous.

2.1. Production of free radicals

Generally, two categories of factors can cause the production of free radicals in the human body are:

- I. *External factors (physical or chemical factors), such as ion beam instrument and even the sun, air pollution, especially carbon dioxide and nitrogen oxide, chemicals, pesticides, anesthetics, and industrial solutions and ozone, particularly drugs chemotherapy.*
- II. *Intrinsic factors (factors Biological), including free radicals and oxidizing reagent that arise due to factors such as oxidase, including mitochondria, and peroxisomal phagocyte, local inflammation and anemia, Bi S K E T noted both internal and external factors With the creation of free radicals, causing lipid oxidation and lipoproteins are Lypvfshyn cell mutagenicity and harassment.*

The most significant damage caused by free radicals in the human body to make include:

Chemical abuse, such as carbon tetrachloride poisoning, inflammation, kill germs, the destruction of nuclear acids (DNA , RNA), Serious damage to the lungs and impaired breathing process, aging (lipid per oxidation of cell membranes) and many diseases including cancer, diabetes, arthritis, Alzheimer's and cataracts.

3. How to neutralize free radical damage

The human body has two types of immune system against the harmful effects of free radicals, particularly oxygen free radicals are.

- I. *Enzymatic defense systems, including glutathione peroxides, superoxide dismutase and catalase must be noted that several minerals including selenium, copper, manganese and zinc are essential for the production and activity of these enzymes, which must be supplied through diet.*
- II. *Antioxidant defense system: Antioxidant compounds are produced in the body or through the supply chain are actually a combination of antioxidants, which reacts with free radicals and molecules to produce safe and protects the body against radical damage in antioxidants able, even with very low concentrations, significantly inhibited the oxidation or oxidation of materials to the pitch lag.*

So what was said to be the body's antioxidant defense system of enzymatic and non enzymatic breakdown into two parts, the enzymatic antioxidant defense system includes enzymes such as superoxide dismutase (SOD), Glutathione peroxides (GPX) And catalase (CAT) And non-enzymatic antioxidant defense system that can be group including the most important antioxidants, carotenoids, ascorbic acid, uric acid and bilirubin cited.

However, the remarkable thing is that the human body in perfect health during the first 20 to 30 years (youth) can well protect itself from oxidative stress that is always a balance between production of free radicals and the defense system of anti through nutrition, food supplements and medicines are also inevitable and unavoidable due to the toxic effects of kinetic antioxidants, the researchers explored the use of natural antioxidants has been paid.

4. The role of antioxidants in the treatment of diseases (cancer)

In the case of cancer, especially in advanced stages, the methods used to remove the tumor and chemotherapy The majority of essential drugs used during chemotherapy side effects are several steps Treatment and recovery can undermine patients' symptoms such as hair loss, digestive disorders, skin disorders, weight loss, anemia and blood disorders including neutropenia , decomposition of red blood cells and ...

Medical experts recommend that oncology patients with chemotherapy of diets rich in antioxidants and antioxidant supplements to control mitigate and prevent use of the above complications.

The beneficial effects of antioxidant compounds can be significant in protecting cell membranes against lipid per oxidation mechanisms, which are caused by free radicals caused by chemical agents, was observed.

5. Sources of natural antioxidants

Some foods that are rich in natural antioxidants are consumed in the diet over a healthy, it can be to get the antioxidants your body needs to strengthen the antioxidant defense system to meet most of them can be fruits, vegetables, grains, legumes, red and white meat, fish and many aquatic cited. New research has shown that some fish are rich sources of antioxidants, which in some cases several times higher antioxidant capacity of plant antioxidants are the mines of the fish eggs, crustaceans, especially shrimps and marine crabs, jellyfish and some sea urchins.

Of Many aquatic organisms, various compounds with antioxidant properties have been extracted from some of these antioxidants and how to identify building performance have been used in pharmaceutical processes.

6. Research on free radicals and antioxidants

Researchers believe that the increased absorption of dietary antioxidants by increasing consumption of dietary supplements rich in natural antioxidants, the tissue damage caused by free radicals and reduces the incidence of complications, including disease prevention will prove very Free radicals are highly reactive and difficult because they have very short half-life of free radicals and thus cannot be directly measured and evaluated, but the damage caused by them as an indicator, search, and review other problems, however, For example, free radicals are combined with a protein can produce over 100 different products, or when combined with lipid free radicals, highly unstable material is not only complex but also break a lot of complexes, in addition to measuring each The compounds in the blood cannot be permanent damage to the body because the body is able to largely prevent the disposal of these used successfully to prevent the next injury.

Researchers to overcome these problems and advanced are examples of systems of biochemical reactions of free radicals is able to show any identification and discovery of new signs of damage from free radicals, for being informed of what is really inside the body gives a necessary and unavoidable.

Table 3-1 antioxidants extracted from marine

Reference	Extractive compounds	species
Sun & etal (2004)	Exopolysaccharide	Keissleriella
Abdol – lateff (2006)	Isobenzofuranone	Epicoccum . sp
Zhang & etal (2007)	Fatty acid fraction	Agrocybe aegerita
Miyake & etal (2005)	Bio chnological formation from flarone	Aspergillus saitoi
Strobed & etal (2003)	Isopestacin	Pestalotiopsis microspora

7. Evaluation methods of free radicals (oxidative stress):

Since free radicals have a short half-life methods of measuring them ESR Advanced devices has been very expensive for the assessment of oxidative stress directly by simply not possible, but can be examined to determine the amount of antioxidant activity. However, the results based on more accurate measure of antioxidant activity and are considered.

8. Antioxidants evaluation methods

Different methods to evaluate the activity and capacity of antioxidants Biological fluids (blood, lymph, etc.) exist, but all these methods are based on three main:

- I. *Techniques ORAC*
- II. *FRAP*
- III. *Randox*

The technique **ORAC** Ability of biological fluids from absorption of oxygen radicals that are produced in trace amounts during the metabolism, in order to measure the amount of enzyme super Aksyda Dsymvtaz (**SOD**) Is measured as the most important enzymes in the body's antioxidant defense system against oxygen free radicals Is. The technique **FRAP** Ability of biological fluids in the recovery of ferric ions (Fe^{+3}) and down (Fe^{+2}) to be measured by spectrophotometer methods.

Technique **Randox** The only way that the amount of antioxidants to M (TAS) was measure the biological fluids of this method is based on spectroscopy.

Oxidative stress indices and their application in the evaluation of antioxidants :

Although from 1996 onwards the **FRAP** was used for measuring antioxidant capacity in this way but the fact that some antioxidants such as iTunes Glvta peroxidase are ignored, then use it to

limit non-specific and led to extensive research since 2005, other indicators to evaluate the anti- The most important indicator of oxidant may be selected include:

- I. *The amount of thiol groups (-SH) Plasma*
- II. *Liz rate Rbc (Lyses of red blood cells)*
- III. *Assessment of lipid per oxidation*

Very sensitive to oxidative damage of plasma thiols levels in conditions of oxidative stress can be greatly reduced, usually by spectrophotometer methods of plasma thiol groups in the presence of a suitable reagent (reagent **Ellman**) was measured.

Mainly red blood cells (**Rbc**) An appropriate model for assessing and measuring the damage caused by free radicals because the free radicals attack the cell membrane lipid per oxidation and membrane proteins **Rbc** Ultimately caused the destruction of the membrane and hemolysis hemolysis provide **Rbc**, in the cells (hemoglobin) is released to the review and measurement methods, spectroscopy is obviously much stronger antioxidant defense system and antioxidant capacity of blood is higher than the percent lyses **Rbc** (Under the effects of free radicals) is reduced.

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