



Bioavailability of Phenolic Compounds in Food and their Properties in Cellular Protection

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Editorial

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Editorial

At the moment, the world population is focused on seeking the best solutions to face the pandemic COVID 19. Health professionals, in a short period of time, have positioned themselves seeking technical and scientific knowledge to face the coronavirus 19, learning every day what are the ways best suited to prevent its spread. Scientific studies are being carried out to have efficient vaccines that can combat the proliferation of coronavirus. Resources are limited and the fragility of a large part of the world population, with restrictions on housing, sanitation, health care, food and social security must be among the priorities to give organisms the conditions to react to contamination by coronavirus.

The inflammatory process is usually initiated by oxidation by reactive oxygen species (ROS), which are represented by peroxides, superoxide ion, hydroxyl radical, singlet oxygen, they can be formed by normal metabolism and also induced by environmental factors such as sunlight, pollution, cigarette, ionizing radiation, alcohol among others and intrinsic as bacterial, viral and parasitic infections. The body is able to avoid damage caused by reactive oxygen species through antioxidant enzymes such as superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GTX) and antioxidant vitamins such as vitamins C; E; A and carotenoids.

In the lipid laboratory of the Faculty of Pharmaceutical Sciences of the University of São Paulo-BRAZIL, in order to collaborate with the strengthening of the organism in the fight against infections, several works were carried out with spices, aiming at its phenolic compounds through its antioxidant activity. The following information was partially obtained from my original article: Phenolics in Food [1]. The

antioxidant action, common to phenolic compounds, is due to the potential of oxide reduction of its molecules, to their ability to compete for active sites and receptors in different cell structures, or even to the modulation of the expression of genes that encode proteins involved in intracellular defense mechanisms against oxidative and degenerative processes of cellular structures [2]. Thus acting as antioxidants, phenolic compounds can donate a hydrogen atom to the structures of free radicals, sequester pro-oxidizing metals, act on the activity of antioxidant enzymes such as (SOD), (CAT) and (GTX), in addition to other metabolic activities.

Beyond the spices, fruits such as cashews, pequi, pomegranates, citrus seeds and algae were also studied, as they demonstrate the possibility of acting as antioxidants and anti-inflammatories and also induce changes in the antioxidant enzymes of the animal organism, and interfere in the production eicosanoids and cytokines [3-6].

The procedure for extracting the phenolic compounds from spices can be done by simple extraction with boiling water (tea). The phenolic compounds present in spices are represented by flavonoids and phenolic acids, mainly derivatives of caffeic acid: chlorogenic and rosmarinic acids, in addition to ferulic, salicylic, quinic, ferulic, gallic acids, among others. That can be absorbed in stomach and small intestine [7].

In models of inflammation, spice extracts reduce the concentrations of prostaglandin E2 (PGE2), leukotriene B4 (LTB4), IL-6 and TNF- α in a dose-dependent manner, in addition to decreasing the recruitment of inflammatory cells to the inflammation site. In the laboratory studies it was observed that the anti-inflammatory effect of spices

is related to changes in the activity of the enzymes SOD, CAT and in the reduction of lipid peroxidation. In in vitro culture of neutrophils stimulated with lipopolysaccharide (LPS) and treated with extracts of spices, the production of nitric oxide was reduced, with no toxicity for cells in vitro [2]. Like rosemary, other spices, such as cinnamon, oregano, coriander, cloves, among others, are also important because they have similar antioxidant activities.

The evaluation of phenolic compounds, carried out in this laboratory, has been done both in raised laboratory animals and in vitro, whose cells present important responses both in their influence on cell development and in the inhibition of the proliferation of viruses. The synergistic effect of the association of synthetic and natural antioxidants against the proliferation of the para-influenza virus was evaluated [8]. The effect of rosemary extracts on DNA inactivation of Herpes virus 1 (HSV-1) was verified in VERO cells. [9] Inactivation of the influenza virus by extracts of oregano has been verified in animals [10].

Conclusions

The results obtained at the Lipid Laboratory of the Faculty of Pharmaceutical Sciences of the University of São Paulo indicate, by biochemical studies and in cell culture in vitro, that different fruits and especially spices, due to the presence of phenolic compounds in their compositions, can collaborate with the strengthening of the organism in the prevention of various types of infections, both viral and microbial, and its consumption should be stimulated.

It was found that cinnamon, rosemary, oregano and fennel teas or extracts have antioxidant and anti-inflammatory activities and can participate in the process of inhibiting viral replication. So there is a great possibility that the use of the same associates may contribute to the stimulus in increasing the resistance of the organism, in the face of infection by the new coronavirus 19.

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