

Antioxidant Activity of Some Mongolian Plants

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Abstract

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Antioxidant agents reactive oxygen species can be used for several cosmetic and medical applications. The goal of our study was to evaluate the antioxidant activity of 69 plant samples of 68 species belonging to 55 genera and 25 families collected from Mongolia in August 2011. The antioxidant capacity of a methanolic extract of plants was evaluated by analyzing the scavenging capacities of free radicals of 2,2-diphenyl-1-picrylhydrazyl (DPPH) and compared with the commercial standard, butylated hydroxyanisole (BHA). We compared our experimental data with the BHA and divided in 4 groups by the antioxidant activity of samples. There were 12 samples with very strong antioxidant activity (IC₅₀ were < 4.4 µg/ml), 39 samples with strong antioxidant activity (IC₅₀ were 4.4 ≤ 25.99 µg/ml), 10 samples with moderate antioxidant activity (IC₅₀ were 26 ≤ 50.99 µg/ml), and 8 samples with weak antioxidant activity (IC₅₀ were ≥ 51 µg/ml). All extracts of plant samples showed concentration dependent DPPH free radical scavenging activity indicating the presence of potent natural antioxidant compounds.

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Introduction

Types of reactive oxygen species (ROS) include the hydroxyl radical, hydrogen peroxide, the superoxide anion radical, nitric oxide radical, singlet oxygen, hypochlorite radical, and various lipid peroxides. These can react with membrane lipids, nucleic acids, proteins and enzymes, and other small molecules (Simon *et al.*, 2000). Oxidative stress can be due to several environmental factors, such as exposure to pollutants, alcohol, medications, infections, poor diet, toxins, radiation etc. Oxidative damage to DNA, proteins and other macromolecules may lead to a wide range of human diseases, most notably heart disease and cancer.

Everyday our bodies produce free radicals as a product of our natural processes. These free radicals are capable of attacking the healthy

cells of the body. Cell damage caused by free radicals appears to be a major contributor to aging and diseases, like cancer, heart disease, decline in brain function, decline in immune system etc. (<http://www.oxidativestressresource.org/>). Overall, free radicals have been implicated in the pathogenesis of at least 50 diseases (<http://www.news-medical.net/health/What-are-Antioxidants.aspx>).

Apart from diet, the body also has several antioxidant mechanisms that can protect itself from ROS mediated damage. The antioxidant enzymes – glutathione peroxidase, catalase, and superoxide dismutase (SOD) are such enzymes. They require micronutrient cofactors, such as selenium, iron, copper, zinc, and manganese for their activity. It has been suggested that an inadequate dietary