

Evaluation of Total Phenolic Content and Antioxidant Activity in Amaranth Seeds Grown in Latvia

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Abstract : Daily intake of products rich in antioxidants that scavenge free radicals in cell membranes is an effective way to combat oxidative stress. Last year there was noticed higher interest towards the identification and utilization of plants rich in antioxidant compounds as they may behave as preventive medicine. Amaranth seeds due to polyphenols, anthocyanins, flavonoids, and tocopherols are characterized by high antioxidant activity. The study aimed to evaluate the total phenolic content and radical scavenging activity of amaranth seeds cultivated in 2020 in two farms in Latvia. One sample of amaranth seeds came from an organic farm, the other - from a conventional farm. The total phenol content of amaranth seed extracts was measured with the Folin-Ciocalteu spectrophotometric method. The total phenols were expressed as gallic acid equivalents (GAE) per 100 g dry weight (DW) of the samples. The antioxidant activity of amaranth seed extracts was calculated based on scavenging activities of the stable 2,2-diphenyl-1-picrylhydrazyl (DPPH[•]) radical, the radical scavenging capacity (ABTS) was demonstrated as Trolox mM equivalents (TE) per 100 g⁻¹ dry weight. Three parallel measurements were performed on all samples. There were significant differences between organic and conventional amaranth seeds in terms of total phenolic content and antioxidant activity. Organic amaranth seeds showed higher total phenolic content compared to conventional amaranth seeds, 65.4±6.0 mg GAE 100 g⁻¹ DW and 43.4±7.8 mg GAE 100 g⁻¹ DW respectively. Organic amaranth seeds were also characterized by higher DPPH radical scavenging activity (7.9±0.4 mM TE 100 g⁻¹ of dry matter) and ABTS radical scavenging capacity (13.2±1.5 mM TE 100 g⁻¹ of dry matter). The results obtained on total phenolic content and antioxidant activity of amaranth seeds grown in Latvia confirmed that the samples have a high biological value; therefore, it would be necessary to promote their consumption by including them in various food products, including vegan products, increasing their nutritional value.

Keywords : ABTS, amaranth seeds, antioxidant activity, DPPH, total phenolic content

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