EVALUATION OF FACTORS INFLUENCING THE BIOACTIVE COMPOUNDS OF RED AND WHITE SORGHUM GRAINS

Róbert Nagy[1], Judit Remenyik[2] , Péter Sipos[3]

[1 3] University of Debrecen, Faculty of Agricultural and Food Sciences and Environmental Management, Institute of Nutrition Science, Debrecen
[2] University of Debrecen, Faculty of Agricultural and Food Sciences and Environmental

Management, Institute of Food Technology, Debrecen

Sorghum is one of the most widely grown cereals and contains numerous bioactive components, like phenols, flavonoids, vitamins, and bioactive lipids. Many of them have strong antioxidant property and play a great role in the prevention and regulation of several chronic diseases, like cardiovascular diseases, type 2 diabetes, and have anti-cancer, and anti-inflammatory effects as well. The amount of these compounds are influenced by factors like variety, genetical and environmental conditions, such as variety, soil, weather conditions and nutrition. Nitrogen is considered especially important in plant' grown, which can influence the composition of grains. In this study we analysed 6 sorghum varieties grown in Hungary (red and white) in 3 years. Grains were grown with (60 kg/ha) or without nitrogen fertilization. During the study we estimated total protein content using Kjeldahl method, while condensed tannin (CTC), total phenol content (TPC) and antioxidant capacity were assayed using spectrophotometric methods. Nitrogen addition didn't influence these values significantly, but we found significant ($P<0,05$) differences between varieties and years. Red varieties usually exhibited greater antioxidant activity compared to white ones. They contained a higher amount of phenolic components, condensed tannin, (7,1-fold and 7,4-fold higher) a flavonoid type compound being one of the most important among them. This can explain the higher antioxidant capacities. We found that there is great diversity among sorghum varieties and even between grains in the same colour group, especially for red sorghum. Furthermore, environmental conditions also can be an important factor for the accumulation of bioactive compounds.