Genotypic, seasonal and maturity stage variability in antioxidant capacity of stone fruits

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In Hungary, nutrition-related diseases (heart and vascular attacks, different types of cancer) are among the main causes of mortality. Several epidemiological studies suggested that consumption of fruits and vegetables can help in the prevention of these degenerative diseases. However, the statistics show that Hungarian people do not eat enough fruits and vegetables. One of the possible solutions would be the consumption of fruits with enhanced functional properties and higher levels of the required bioactive compounds. Although berry fruits are generally considered to contain outstanding levels of antioxidants, stone fruits are less known from this aspect. The aim of our examinations was to characterize the antioxidant capacity of stone fruits and to clarify the influencing effect of the genotype, ripening status and cultivation plot. In addition, we wanted to assess how the anthocyanin and vitamin C contents contribute to the antioxidant capacity of sour cherries.

In the present study, the antioxidant capacity was measured with ferric reducing ability of plasma (FRAP) and a photochemiluminescence method (ACW) in 11 sour cherry, 19 sweet cherry, 20 Japanese plum, 6 cherry plum and 6 apricot cultivars. In addition, the content of total phenolics (TPC), carbohydrate, vitamin C, monomeric anthocyanins and nutrient elements were also determined.

Cultivar averaged mean values of FRAP and TPC results were the highest in sour cherry, and the lowest in cherry plum. Variations between species were the highest in case of sour cherry and sweet cherry. Most of the sour cherries reached the FRAP values of raspberries, which characteristically contain high antioxidant capacity (5-6 mmol AS/L). A sour cherry cultivar reached the outstanding water-soluble antioxidant capacity value of blackberries and elderberries. This attracts attention to the alluring perspectives of this genotype. Correlations between the FRAP and ACW values were close ($r = 0,78$). In average, the sour cherry cultivars contained the highest amounts from several nutrient elements (e.g. Al, Cu, Fe, Mn etc.). The lowest element quantities were detected for Japanese plum cultivars. Levels of Al and K were outstanding in cherry plums. In case of some neurodegenerative diseases, patients should eat such fruits with lower contents of redox active metals (e.g. Japanese plums), because these patients should avoid these metals. We measured the glucose and fructose contents of sour cherries. The highest values of these two monosaccharides were detected in 'Cigány C404' and in 'Cigány 59' cultivars, while VN-07 contained the lowest levels from these sugars. The highest anthocyanin values were observed in fruits of cultivar candidates. Our analysis revealed a small difference between the lowest and highest vitamin C contents. Genetic background of cultivars forms the decisive factor in determining fruits' antioxidant capacity, although the cultivation plot and season may have also considerable modifying effects. Based on our results we can conclude that functional food products can be established from stone fruits.

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Possible role of reactive oxygen species in the development of immunological tolerance

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Since plasmacytoid dendritic cells (pDCs) are professional antigen-presenting cells, they have an important role in the polarization of the adaptive immune responses toward inflammation or antibody production. As professional interferon type I producing cells, the pDCs also possess a significant antiviral function. Previously, the pDCs were thought to be found only in bone marrow, lymphoid organs and blood; however, recent studies have indicated that they can also be detected in inflamed tissues. The pDCs leaving blood circulation and entering peripheral tissues are affected by - in addition to many other factors - the reactive oxygen species produced by inflammatory reactions. The effects of oxidative stress on the functions of pDCs have not been examined yet.