

CORRELATION OF ANTHOCYANIN AND TOTAL POLYPHENOL CONTENT OF BERRIES WITH THEIR ANTIOXIDANT CAPACITIES

Anna Mária Nagy¹, Meriem Serine Hamaidia², Lilla Szalóki-Dorkó²,
Zsuzsa Jókai³, Eva Stefanovits-Bányai³, Mónika Máté^{2*}

¹Holi-Medic Ltd., Fehérvári 44, 1117 Budapest, Hungary

²Department of Fruit and Vegetable Processing Technology,
Institute of Food Science and Technology, Hungarian University of Agriculture and Life Sciences,
Villányi 29-43, 1118 Budapest, Hungary

³Department of Food Chemistry and Analytics, Institute of Food Science and Technology,
Hungarian University of Agriculture and Life Sciences, Villányi 29-43, 1118 Budapest, Hungary

*e-mail: mate.monika.zsuzsanna@uni-mate.hu

Abstract

Widely known berries, such as blueberries (*Vaccinium myrtillus* L.) and cranberries (*Vaccinium oxycoccos* L.), are well-known functional foods. At the same time, berries that are less known to the general population and therefore consumed less often - such as Aronia (*Aronia melanocarpa* Micht.), black elderberry (*Sambucus nigra* L.), and black currant (*Ribes nigrum* L.) - although their nutritional values are also outstanding. Therefore, our research aimed to understand better the correlations between certain berries' dietary values and their antioxidant capacity properties and to broaden their therapeutic usability.

During our studies, we measured spectrophotometrically the total polyphenol content - TPC (by the Folin-Ciocalteu method), the anthocyanin monomer content (with pH differential method), and antioxidant capacity using the ferric reducing antioxidant power (FRAP) and Trolox-equivalent antioxidant capacity (TEAC) method, of the 65% concentrated juice made by vacuum evaporation from the berries mentioned earlier.

Our results confirmed a strong correlation between the total polyphenol content of berries and the antioxidant capacity measured by the TEAC method, but no correlation was measured by the FRAP method. However, the combined TPC and anthocyanin content were closely correlated with the antioxidant capacity measured by the FRAP method, but not by the TEAC method. This also highlighted that due to their different nutritional values, using several antioxidant capacity measurement methods together could more accurately determine the combined antioxidant capacities of individual fruits. For example, the antioxidant capacity of cranberries was highest using the TEAC method, but lowest with FRAP.

Overall, it can be stated that higher anthocyanin content and antioxidant capacity were measured (by FRAP method) in the juice concentrates of the lesser-known black elderberry, Aronia, and blackcurrant than the well-known blueberry and cranberry juice. Therefore, using lesser-known berries for a broader therapeutic purpose may be advisable.

Key words: Antioxidant capacity, Polyphenols, Anthocyanins, Berries, Dietary nutrition.