

NUTRITIONAL CONTRIBUTION OF BERRIES FOR FIGHTING OXIDATIVE STRESS

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Abstract

Fruits and vegetables are rich in polyphenols, which are the major source of antioxidants in diet, with a number of positive effects on human health. The balance between the production of free radicals and antioxidant intake is very important because of the stress that is present in every organism. In this study was used a standard method like determination of total phenols with Folin-Ciocalteu reagent and some methods that are rarely used in the analysis of samples which are rich in polyphenols, such as near-infrared spectroscopy and Briggs-Rauscher reaction. Wild berries offer a range of vitamins, minerals and phytochemicals, and the most of them have antioxidant properties.

The aim of this work was to examine the berries (strawberries, blackberries, raspberries, blueberries and red currants) by determining the share of total phenols (TP), the antioxidant activity using the Briggs-Rauscher's method (BRAI), and determination of the colorimetric and near infrared spectroscopy (NIRs) analysis. All the mentioned was subjected to chemometric analysis to detect the "fingerprint" of the phenolic compounds for tested samples allowing separation of these samples depending on the preparation and content of the polyphenols. The extraction was conducted using the (i) reflux method and (ii) using the ultrasound.

Colorimetric analysis showed that the darker and extracts with domination of blue-green color have more antioxidant power than the lighter and yellow-red samples. Application of near-infrared spectroscopy and Briggs-Rauscher reaction proved to be very successful in measuring the polyphenolic compounds and thus the highest value of antioxidant activity showed blackberry (BRAI = 6.03), and the smallest strawberries (BRAI = 0.49). But the application of chemometric methods that included NIRs showed the possible to predict the content of phenols and AOA just based on the absorbance spectra, what can be used in the control of berry fruit quality.

Key words: Berries, NIR spectroscopy, Oxidative stress, BR-reaction, Colorimetry, Chemometrics, classification.