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Extractability of polyphenols from black currant, red currant and gooseberry and their antioxidant activity

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In this study, we analyzed extracts of black currant, red currant and gooseberry fruits obtained with methanol, methanol 50% and water. For each extract total polyphenol content, total flavonoid content and total anthocyanin content was assessed. The antioxidant activity of extracts was evaluated by 1,1-Diphenyl-2-picrylhydrazyl (DPPH) and 2,2'-azino-bis(3-ethylbenzothiazoline-6-sulphonic acid) (ABTS) radical scavenging capacity and by the photo-chemiluminescence (PCL) method. Identification and quantification of individual phenolic compounds was performed by means of high performance liquid chromatograph coupled with diode array detector (HPLC-DAD) analysis. From each fruit, best extraction of polyphenols was obtained with methanol 50%. In case of red currants and gooseberry there was no significant difference in flavonoids and anthocyanins extraction rate by the different extraction solvents. For black currants the methanol and methanol 50% extract presented the highest antioxidant activity. For red currant extracts with methanol 50% showed stronger antioxidant activity ($IC_{50} = 5.71$ mg/ml for DPPH, $IC_{50} = 1.17$ mg/ml for ABTS) than those with methanol or water. In case of gooseberry by the DPPH test the water extract proved to be the most active ($IC_{50} = 5.9$ mg/ml). In the PCL test black currants methanol 50% extract was over 6 times more powerful as the ones from red currants. In case of gooseberries, water extract presented the highest antioxidant activity (41.84 μ mol AAE/g). In black currant cyanidin-3-glucoside was the major compound. Quercetin 3-O-glucoside was identified in each sample. From cinnamic acid derivatives neochlorogenic acid was present in black currants in the highest amount (356.33 μ g/g).

Biography

Laczkó-Zöld Eszter is a Lecturer in the Department of Pharmacognosy and Phytotherapy at University of Medicine and Pharmacy of Tîrgu Mures (Romania) where she received her PhD in Pharmaceutical Sciences - Phytochemistry. She teaches courses in pharmacognosy, principle of nutrition, nutraceuticals, phytopreparations in dermato-cosmetology and food supplements in nutritional practice. Her main research topics are isolation and identification of biological active compounds from medicinal plants and edible fruits, qualitative evaluation of food supplements and medicinal plant products.

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