INFLUENCE OF EXTRACTION TECHNIQUES ON THE CHARACTERISTICS OF SAMBUCUS NIGRA L. EXTRACTS

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Abstract

Sambucu nigra L. belongs to the group of plants recognizable by its strong biological activity which was well-known in traditional medicine. However, modern science has confirmed many of its activities such as antimicrobial, antioxidant, immunomodulatory, etc. The biological ability of the plant is closely related with its chemical composition, in the first place with its polyphenolic constituents. The content of individual components in extracts is strongly influenced by isolation technique, as well as the type of solvent. Therefore, the aim of this study was to investigate the influence of modern (microwave-assisted extraction, MAE) and traditional (maceration, MAC) extraction techniques on polyphenol yield in *S.nigra* extracts, as well as on their biological activity. At the same time, the influence of the two most commonly used solvents (water and ethanol) on the mentioned outputs was also examined. The obtained extracts were analyzed spectrophotometrically in order to determine the content of total phenols and flavonoids, while the content of individual polyphenolic components was measured chromatographically using the LC-MS/MS technique. The biological potential of the obtained extracts was determined by measuring their antioxidant and enzyme-inhibitory activities. The obtained results showed that in all examined extract 15 different components were identified, while the two analyzed compounds were under the LoD. Among the identified components the most dominant was quinic acid as well as rutine. It was noticed that MAE was the more prominent technique for the isolation of target compounds, while ethanol was marked as a solvent with better solvating properties towards to polyphenols in comparison to water. Antioxidant assays showed that all examined extracts were capable to act as free-radical scavenges and antioxidants. By applying in vitro assays the ability of the extracts to inhibit the activity of amylase and acetylcholinesterase was determined, and it was showed that they were much more active towards to amylase (2.18-7.14 mg ACAE/mL) than to acetylcholinesterase (0.09-0.11mg GALAE/mL).

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