

Application of separation methods for analysis of phytochemical compounds in plants

Roblová Vendula

Phytochemicals are chemical substances that naturally occur almost in every plant. The significant part is represented by the polyphenolic compounds which are mainly formed as secondary metabolites in plant biosynthesis and perform various functions in organism e.g. protection against pathogens. Polyphenolics are well-known for its antioxidant properties thus the major role consists in regulation of oxidative processes in organism. Also, they reduce the probability of cardiovascular diseases and prevent carcinogenesis.

This work is focused on the determination of polyphenolics in different plant material using analytical separation techniques such as the capillary zone electrophoresis (CZE) and high performance liquid chromatography (HPLC). The main part of this contribution summarizes results obtained by electrophoretic fingerprint of *Mentha* herbal samples supplemented by spectrophotometric characterization of antioxidant activity and total polyphenolic content and discuss the relation between particular characteristics evaluated by principal component analysis. Other parts are based on the determination of selected polyphenolic compounds in sea buckthorn (*Hippophaë rhamnoides L.*) plant parts and noni (*Morinda citrifolia*) products using HPLC. In all cases, the critical part of analysis relates with plant samples pre-treatment and extraction procedure. Several extraction technique as Soxhlet extraction, solid phase extraction or liquid-liquid extraction were used for samples treatment and their efficiency were compared.

Also antioxidant properties of polyphenols were studied across all type of plant samples. Commonly determined parameters of antioxidant properties are total content of polyphenols (TPC) and total antioxidant activity (TAA).