Abstract

Study of the metabolic profile of *Papaver* extracts by chromatographic and chemometrics methods

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Background and objectives: Chromatography fingerprinting is considered as a comprehensive method for quality control, diagnosis and the nature of herbal drugs, and it is important to classify the different samples of medicinal plants and determine the chemical species present in them. **Methods:** In this research, a new strategy based on the combination of multivariate curve differentiation and multivariate classification has been developed for full analysis of fingerprint chromatography of extracts of aerial and terrestrial organs of different species of the *Papaver* genus. For this purpose, the extraction of chemical components in 18 different vegetation samples was performed by solvent extraction method using soaking method and repeated three times for each sample. Subsequently, the methanol extracts were analyzed by high performance liquid chromatography-PDA detector and their fingerprint chromatography was obtained. The method of multivariate-least square squared-time separation was used to analyze the same data matrices for each chromatographic region by applying non-negative constraints, single-peak, spectral normalization, and component association. **Results:** Pure models chromatography, spectra and concentration of all chemical species found in different samples were obtained. In addition, various *Papaver* species were confirmed and in the next step some of them were determined by comparing the pure spectrum with the standard range. **Conclusion**: The results showed that the combination of multivariate and multivariate clustering methods could be used successfully for the complete analysis of the *Papaver* genus extracts, and open a new window to the analysis of the chemical components of complex samples such as herbal medicines.

Keywords: chemometrics, fingerprint chromatography, *Papaver* genus