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Application of HR GC/TOF for Substance Analysis of Different Fraction Extracts in *Codonopsis lanceolata* Root

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[Introduction]

This experiment was conducted to analyze unknown substances of different fraction extracts in *C. lanceolata* root. Recently, gas chromatography coupled to high-resolution time-of flight mass spectrometry has been demonstrated as a powerful and highly effective analytical tool in various fields such as analysis of food and environmental contaminants, flavor components, drugs screening, petrochemical analysis, or metabolomics studies. The analytical method enables a good statistical separation and facilitates the identification of differences or similarities between groups. In this study, the comparative analysis of metabolites between different fractions of *C. lanceolata* was performed using HR- GC/TOF-MS.

[Materials and Methods]

The extraction was performed by different solvent fractions(n-hexane, methylenechloride, ethylacetate, n-butylalcohol and water). HR-GC/TOF MS analysis was conducted using a 7890A gas chromatograph equipped with a GCT premier TOF mass spectrometer. The GC oven temperature was maintained at 60 °C for 2 min and then increased to 320 °C at a rate of 10 °C/min. The final temperature(320 °C) was maintained for 10 min. Samples (1 μ L) with a split ratio of 1:5 were injected. The GC/TOF MS raw data were analyzed using the MarkerLynx Applications Manager version 4.1 for mass spectral peak identification and quantification. PLS-DA was used for multivariate pattern recognition analysis and supervised pattern recognition methods to examine intrinsic variation.

[Results and Discussions]

As a result of comparing the detection efficiencies of the components to the *C. lanceolata* samples according to the five kinds of extraction solvents, the extraction efficiencies were higher in order to ethyl acetate, butanol, methylene chloride, hexane and water. Especially, the detection efficiency of the components in the ethyl acetate solvent was found to be the highest. we conducted metabolite profiling of different solvent fraction samples in *C. lanceolata* using GC/TOF MS to examine differences. Moreover, multivariate analysis showed that important markers were shown for characterizing the different fraction extracts.

[Acknowledgements]

This work was supported by Korea Institute of Planning and Evaluation for Technology in Food, Agriculture, Forestry(IPET) through High Value-added Food Technology Development Program, funded by Ministry of Agriculture, Food and Rural Affairs(MAFRA)(grant number 114036-04-3-SB010)

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