Metabolomics approach for the discrimination various ginseng products by UPLC-TOF MS

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인삼의 metabolomics 연구에 의한 다양한 인삼제품의 지역판별

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Objectives

The metabolomics approach combining UPLC-MS-based analysis with OPLS-DA was developed for discriminating the six geographical origins (Kangwon, Kaesung, Punggi, Chungbuk, Jeonbuk and Ansung) of fresh Korean *P. ginseng* samples. And we performed metabolomic approach to discriminate Korean and Chinese ginseng products (white and red ginseng) using multivariate statistical analysis.

Materials and Methods

○ Materials

– Fresh *P. ginseng* were collected locally from 6 ginseng cooperative association (Kangwon, Kaesung, Chungbuk, Kanghwa, Jeonbuk, and Ansung) in Korea

– Almost white and red ginsengs were purchased on Korean markets. Some of white and red ginsengs were bought on Chinese markets.
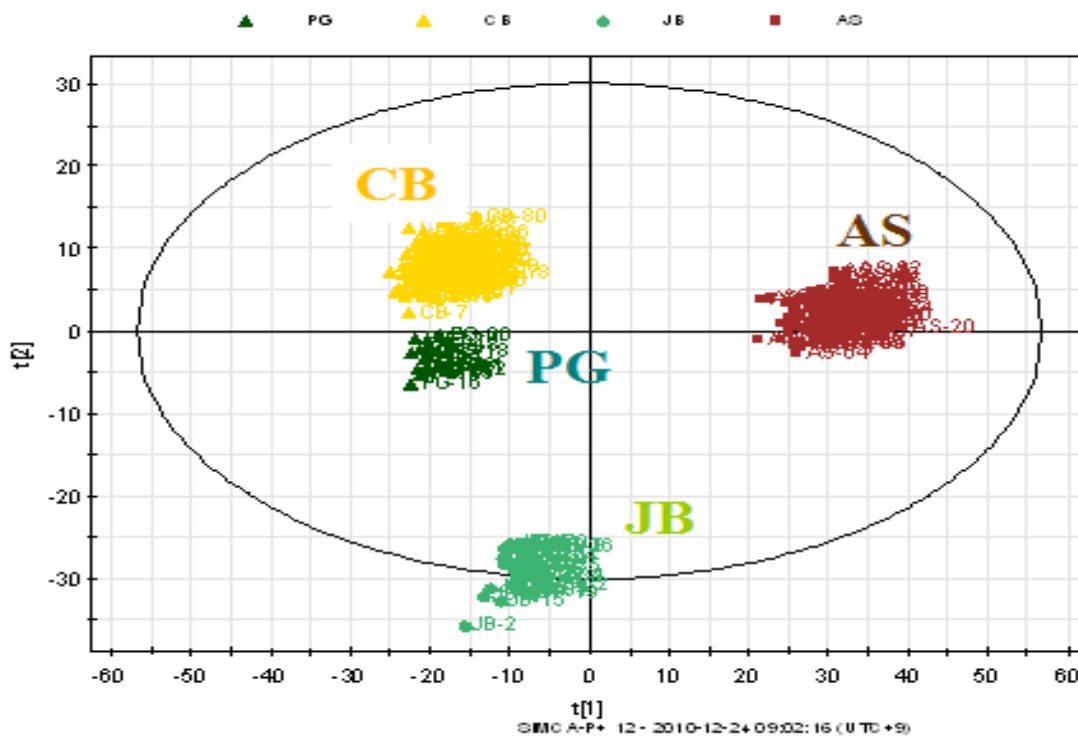
○ Methods

Ginseng metabolite profiling was performed using an ACQUITY UPLC[TM]system and a sample manger coupled to Micro mass Q-TOF Premier[TM] mass spectrometer (Waters Corporation, Milford, MA, USA). The mass raw data were analyzed by the MarkerLynx applications manager version 4.1 (Waters, Manchester, UK). Then, OPLS-DA was used for the whole dataset in order to discrimination of ginseng samples according to their geographical origin. The resulting two-dimensional matrix of measured mass values and their intensity for each sample were further exported to SIMCA-P[+] software 12.0 (Umetrics, Umeå, Sweden) for multivariate statistical analysis.

Results

This chemometric data analysis permitted the discrimination of ginsengs of same ginseng products from different geographical origins in Korea as well as Chinese origins. The results can be applied to protect domestic ginseng industry by the judgment of illegal/low-priced imported ginseng products.

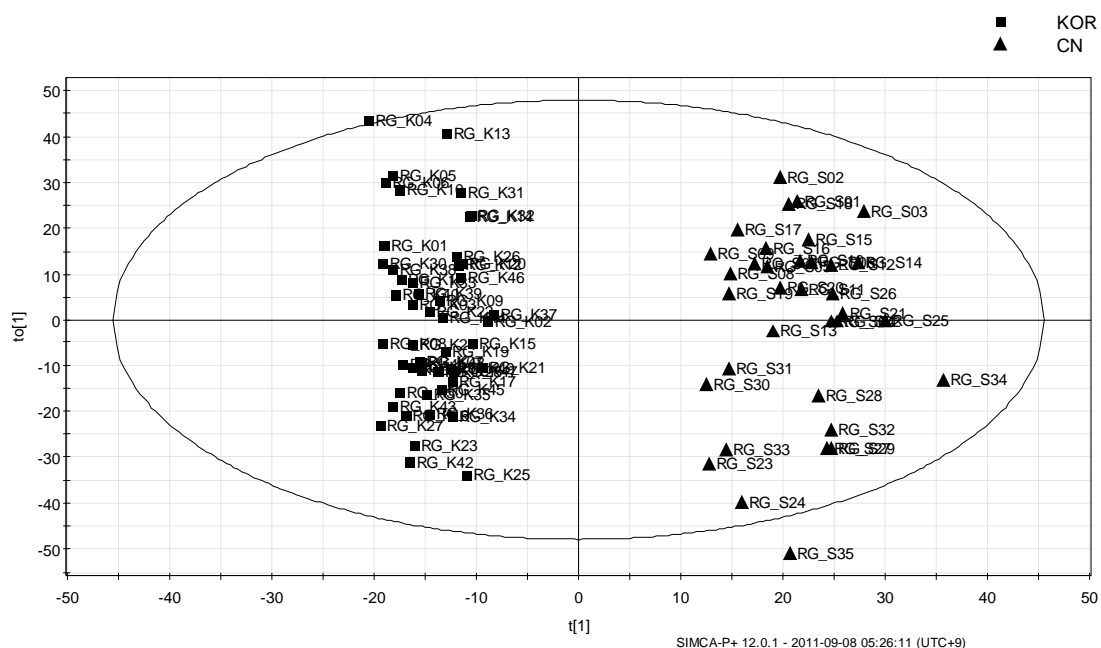Corresponding author : Sei-Ryang Oh E-mail : seiryang@kribb.re.kr Tel : 043-240-6110

A)

B)

Figure 1. The mutlvariate statistical analysis of ginseng samples. A; O2PLS-DA score plots of 4 geographical origins (AS;■, PG;▲, JB;●, CB;▲). B: red ginseng (■;Korean, ▲;Chinese)