

Gas Chromatography–Mass Spectrometry를 이용한 *Artemisia* spp.의 분류

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Classification of *Artemisia* spp. Using Metabolite Profiling by Gas Chromatography–Mass Spectrometry

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Objectives

Artemisia genus is one of the oldest and best known medicinal herb. It is the large genus with about 400 species under the Asteraceae in the world and among them about 40 species are grown in Korea.

In the present study we classified *Artemisia* species using gas chromatography coupled with mass spectrometry (GC-MS) based metabolite profiling.

Materials and Methods

The nine samples were (*Artemisia annua* L., *A. argyi* H. Lev & Vaniot, *A. gmelini* Weber ex Stechm., *A. lavanduleafolia* D. C., *A. princeps* Pamp., *A. rubripes* Nakai, *A. selengensis* Turcz. ex Besser, *A. stolonifera* (Maxim.) Kom. for. *stolonifera*, and *Artemisia* sp.) (Fig. 1) collected on 5 June 2008 at Rural Development Administration in Suwon, Korea.

The extracts of *Artemisia* spp. were analyzed by Agilent 5973 MSD mass spectrometer with Agilent 6890 gas chromatography. NIST (National Institute of Standards and Technology, USA) library was used to identify total metabolite peaks. The metabolome data were analyzed by principal component analysis (PCA) using the software program SIMCA-P 11.0 (Umetrics, Umea, Sweden).

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Results

Metabolome data show specific patterns of each sample group by PCA (Fig. 2). In addition clearer discrimination between sample groups is observed by three dimensional scatter plot. Therefore, we suggest that GC-MS based metabolite profiling has a potential as an alternative for classifying medicinal herbs (*Artemisia* genus). However, more investigations and sufficient evidences are needed for metabolome based plant taxonomy.

Fig. 1 The nine species sample of *Artemisia* : (1) *Artemisia annua*, (2) *A. argyi*, (3) *A. gmelini*, (4) *A. lavanduleafolia*, (5) *A. princeps*, (6) *A. rubripes*, (7) *A. selengensis*, (8) *A. stolonifera* for. *stolonifera*, and (9) *Artemisia* sp.



Fig. 2 (a) PCA score plot from metabolite database with (1) *Artemisia annua*, (2) *A. argyi*, (3) *A. gmelini*, (4) *A. lavanduleafolia*, (5) *A. princeps*, (6) *A. rubripes*, (7) *A. selengensis*, (8) *A. stolonifera* for. *stolonifera*, and (9) *Artemisia* sp., (b) Three dimensional scatter plot

