

令和2年度「日本薬局方の試験法等に関する研究」研究報告 LC/MS メタボロームを用いたバクモンドウの品質多様性評価*2

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Quality Evaluation of Ophiopogon Root Based on LC/MS Metabolome

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Summary

JP18 stipulates *Ophiopogon japonicus* Ker-Gawler as the botanical origin for Ophiopogon Root. Although *O. japonicus* sensu lato (s.l.) includes *O. japonicus* s.s., *O. ohwii* (Nagaba-janohige) and *O. chekiangensis* (Sekko-ryunohige), the quality variation of the crude drugs derived from the different species is unclear. In this study, we analyzed the chemical profiles of the crude drugs derived from each species by using LC/MS and applied multivariate analysis to the obtained data to estimate the chemical diversity of Ophiopogon Root.

Principle components analysis (PCA) of the LC/MS data revealed that the crude drugs derived from each species have distinct chemical compositions. However, the profiles of the marketed products originated from *O. japonicus* s.s. were similar to those of *O. chekiangensis*. These results suggest environmental factors such as cultivation method and cultivation area have more influence on the chemical profile of the crude drug than genetic factors.

A PCA loading plot indicated that each species contains characteristic steroidal saponins. Although homoisoflavones are also major secondary metabolites in Ophiopogon Root, only two compounds were detected in *O. ohwii*. There appear to be differences among the plant species in the relative contents of steroidal saponins and homoisoflavones.

Next, in order to focus on homoisoflavones, we removed signals with m/z 450 and more from the data matrix to exclude steroidal saponins, which have a larger molecular weight. In the PCA score plot, each species formed a distinct group, similarly to the result in the case of PCA of all data. However, in this analysis many homoisoflavones were observed as characteristic compounds in each group.

In conclusion, Ophiopogon Root from *O. japonicus* s.l. could have various chemical profiles in terms of steroidal saponin and homoisoflavone compositions due to intraspecies variation. However, the chemical diversity is not large, and environmental factors have more influence than genetic factors.

Key words

Ophiopogon Root, *Ophiopogon japonicus* sensu lato, LC/MS metabolome, Steroidal saponin, homoisoflavone