PC-04

Characterization and Metabolic Profile on the Fatty Acid, Tocopherol and Phenolics Content of Perilla Species

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[Introduction]

Perilla is the genus of annual herbaceous plants of Labiatae family, originated in Eastern Asia. And it has been classified into four species: most commonly cultivated *P. frutescens*, and three wild species: *P. citriodora*, *P. hirtella* and *P. setoyensis*. Perilla also have been used as an important traditional herbal medicine for treating various disease including depression, anxiety, tumor, cough, antioxidant, allergy, intoxication, and some intestinal disorders. In previous reports, essential oil and flavonoids in the leaves were emphasized, and the seeds were generally overlooked. The objectives of this study were to determine the composition of oil, fatty acid, tocopherol and phenolics contents of seeds of *P. frutescens*, *P. citriodora*, *P. hirtella* and *P. setoyensis*.

[Materials and Methods]

Four Perilla species were cultivated in the experimental field at the Department of Southern Area Crop Science, NICS, RDA at Miryang, in 2017. After harvesting, perilla seeds were dried and stored at 4°C until analysis. Lipid was determined using a Buchi B-811 soxhlet extraction system. Nitrogen content was determined by a Rapid N Cube system. GC was performed using an Agilent 7890A series equipped with flame ionization detector. Phenolic contents were determined by a UPLC/Orbitrap-MS system. Statistical data analysis was performed using the analysis of variance (ANOVA) and the least significant difference (LSD) test to determine statistically different values at a significance level of $\alpha \leqq 0.05$. All statistical analyses were performed using the SAS EG (SAS Institute Inc., USA).

[Results and Discussion]

Perilla species are grown oil and vegetable crops in Eastern Asia. However, knowledge about the composition of their metabolites in seed is insufficient. Thus, protein, oil, fatty acid, tocopherol and phenolics in the seeds of 4 perilla species were identified and quantified. The results revealed significant variability among the perilla species. *P. frutescens* exhibited the highest protein, oil, linolenic acid and rosmarinic acid contents (29.2%, 41.75%, 63.61%, 1,250.4 μg/g, respectively), whereas *P. setoyensis* had the highest luteolin and total phenolic contents (2,432.5 and 3,609.9 μg/g, respectively). *P. citriodora* had the highest oleic acid (19.0%) and *P. hirtella* had the highest δ-tocopherol (4.7 μg/g) content of these 4 species. These results are helpful for breeding with nutritional quality and phytochemicals for commercial cultivation.

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