

Analysis of Phenolic compounds Contents in *Miscanthus sinensis* Cultivars by HPLC

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HPLC를 이용한 억새 종의 페놀성 화합물 함량의 분석

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Objectives

Phenolic compounds have played important roles in plant as antioxidant, antibacterial and anticancer effects. Recently, *Miscanthus sinensis* cultivars are grown because of their use of bioenergy resources. But, there is little research on their functional material. The purpose of this research was to analyze the phenolic compounds contents in leaves and stems of *Miscanthus sinensis* cultivars using High Performance Liquid Chromatography.

Materials and Methods

○ Materials

-Samples were classified by collected four regions: 1. Dunnae-myeon, Hoengseong-gun 2. Bangdong-ri, Inje-gun 3. Dongsan-myeon, Chuncheon-si and 4. Iowa.

-Parts of samples : Leaf and stem

○ Methods

Preparation of samples

2 g of dried and ground samples were extracted in 10 mL of acetonitrile and 2 mL of 0.1 N HCl, and stirred for 2h at room temperature. The extract was filtered through a No. 42 Whatman filter paper and concentrated by vacuum evaporator. Residues were redissolved with 10 mL of 80% aqueous methanol (HPLC grad, J.T. Baker, USA), and filtered through a 0.45 μ m syringe filter and then transferred to 2 mL vials.

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Phenolic compounds analyses

The HPLC system was performed using Agilent 1100 series with PDA detector (Germany). Separation was conducted on a YMC-Pack ODS-AM-303 (5 μm , 250 mm \times 4.6 mm I.D.) column. And, 20 μL of filtrate were injected in the HPLC system; the same system and column being used as for phenolic compounds analyses. Compounds were detected at a wavelength of 280 nm. The mobile phases were distilled water with 0.1 % glacial acetic acid (solvent A) and acetonitrile with 0.1 % glacial acetic acid (solvent B). The gradient was followed: 0 min, 92% A : 8% B ; 0-2 min, 90% A : 10% B ; 2-27 min, 70% A : 30% B ; 27-50 min, 10% A : 90% B; 50-51 min, 0 % A : 100% B ; 51-60 min, 0% A : 100% B ; 60-63 min, 92% A : 8% B. Run time was 60 min using a flow rate of 1 mL min⁻¹.

Results and Discussion

The results of this study showed that total average contents of phenolic compounds were 6929.4 $\mu\text{g g}^{-1}$. The highest concentration of phenolic compounds was in the Dunnae-myeon leaf (12418.6 $\mu\text{g g}^{-1}$) and the lowest concentration was in the Dongsan-myeon stem (2109.3 $\mu\text{g g}^{-1}$). Also, the contents of phenolic compounds in all kinds of leaves were higher than those of the stem. And syringic acid revealed the highest contents of phenolic compounds in every sample. The results of this study showed differences between leaf and stem. These results suggested that *Miscanthus sinensis* cultivars can be used for functional materials.

Table 1. 4 types of *Miscanthus* cultivars

Area	Part	Accessions	Area	Part	Accessions
Dunnae-myeon	Leaf	HDL	Dongsan-myeon	Leaf	CDL
Dunnae-myeon	Stem	HDS	Dongsan-myeon	Stem	CDS
Bangdong-ri	Leaf	IBL	Iowa	Leaf	IOL
Bangdong-ri	Stem	IBS	Iowa	Stem	IOS

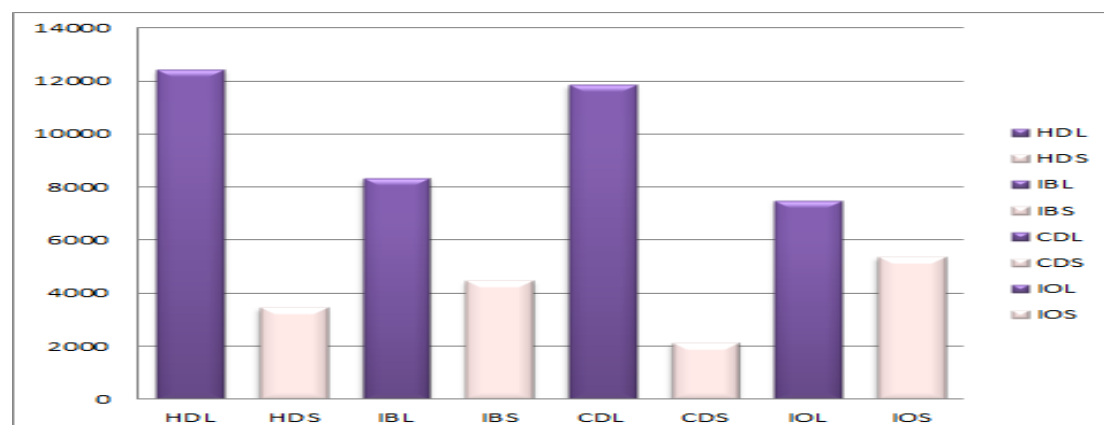


Figure 1. The total contents of phenolic compounds in *Miscanthus* cultivars leaf and stem