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Characterization of Phenolic Compounds in Black Adzuki Bean Using UPLC/Orbitrap-MS Techniques

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[Introduction]

Adzuki bean [*Vigna angularis* (Willd.) Ohwi & H. Ohashi], an annual plant and an important crop from the Leguminosae family, is widely cultivated in Asia. The *V. angularis* had been used as an important traditional medicine for detoxification, diuretic action, and remedy for dropsy in East Asian countries such as Korea, China, and Japan. To our knowledge, the phenolic compounds of its black seeds have still not been fully characterized. This prompted us to identify the phenolics by ultra-high-performance liquid chromatography coupled to Orbitrap high-resolution mass spectrometry (UPLC/Orbitrap-MS).

[Materials and Methods]

Adzuki bean (cv Geomguseul) with black seed coat cultivar were cultivated within an experimental field at the Department of Southern Area Crop Science, NICS, RDA at Miryang, in 2018. The crude phenolics extracted with acidic 40% methanol for 2 day at 4°C in darkness. The crude extracts were filtered through a 0.2 μm filter unit prior to for UPLC/Orbitrap-MS. A single-stage Orbitrap mass spectrometer was equipped with Heated Electrospray Ionization Source (HESI). The HESI parameters in positive polarity were as fellows: sheath gas flow rate: 50; aux gas flow rate: 15; spray voltage: 2.5 kV; capillary temp.: 270°C; heat temp.: 400°C. Mass range in full scan mode was set at *m/z* 150-1,000 and MS^2 scan of the two precursor-ion in the first scan.

[Results and Discussions]

The aim of this study was to identify the phenolic compounds in the black adzuki bean (cv. Geomguseul) using UPLC/Orbitrap-MS analysis. Eight phenolic compounds, including myricetin-3-sophoroside (*m/z* 643), myricetin-3-rutinoside (*m/z* 627), quercetin-3-gentiobioside (*m/z* 627), quercetin-3-sophoroside (*m/z* 627), quercetin-3(*p*-coumaroyl)glucoside (*m/z* 757), quercetin-3-glucoside (*m/z* 465), quercetin-3-rutinoside (*m/z* 611), and myricetin (*m/z* 319) were identified from seeds of black adzuki bean, together with ten known anthocyanins that we have previously identified.

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