

## Identification of Saponins in the Seed of Adzuki Bean (*Vigna angularis*) by UPLC-PDA-ESI/MS Analysis

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### [Introduction]

Adzuki bean (*Vigna angularis*) is origin to the tropical region of Asia; currently, it is one of the important crops in Korea, Japan, and China. To our knowledge, the saponins of its seeds have still not been fully characterized. This prompted us to identify the saponins occurring in the seed (cv. Arari) of adzuki beans by employing reversed-phase C-18 column chromatography and high-performance liquid chromatography with electrospray ionization/mass spectrometry analysis.

### [Materials and Methods]

Adzuki bean (*Vigna angularis*, cv Arari) were cultivated within an experimental field at the Department of Southern Area Crop Science, NICS, RDA at Miryang, in 2017. The saponin present in the adzuki beans were characterized by UPLC-PDA-ESI/MS analysis. A 5  $\mu$  L sample of the crude 80% ethanolic extract was injected onto an analytical ACQUITY BEH C18 column. The mobile phase was composed of water (A) and acetonitrile (B). The gradient conditions were as follows: 0-2 min, 10% B; 2-5 min, 10-20% B; 5-15 min, 20-30% B; 15-20 min, 30% B; 20-27 min, 30-40% B; 27-32 min, 40%B; 32-40 min, 40-50% B; 40-50 min, 50-60% B; 50-55 min, 60-100% B; and then held for 10 min before returning to the initial conditions. The other UPLC conditions were as follow: a flow rate of 0.5 mL/min; column temperature, 25 °C; and detection, 205 nm. The mass spectrometer used a ToF MS (Waters) equipped with an electro spray ionization (ESI) source and an ion trap mass analyzer.

### [Results and Discussions]

Saponins play an important role in physiological functions related to human health. The objective of this study was to investigate the profiles of saponins in the seeds of adzuki beans using UPLC-PAD-ESI/MS analysis. The individual saponins were identified by comparing their mass spectrometric data and retention times. From the seed of the adzuki beans, ten saponins were identified, including azukisaponin IV(1), angulasaponin C(2), azukisaponin VI(3), angulasaponin B(4), azukisaponin III(5), azukisaponin II(6), AzII(7), angulasaponin D(8), Azi(9), and angulasaponin A(10). In this method based on UPLC and MS technique provides a scientific basis for quantitative study of all adzuki bean cultivar in the future.

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