Note

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Anthocyanins in red sweetpotato (*Ipomoea batatas* cv. okiyumemurasaki)

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Abstract

This is the first report on analyses of characteristic anthocyanins contained in roots of a newly bred sweetpotato, *Ipomoea batatas* cv. okiyumemurasaki. Cyanidin 3-sophoroside-5-glucoside and peonidin 3-(6-caffeoyl-sophoroside)-5-glucoside were isolated and identified by LCMS and ^{1}H- and ^{13}C-NMR spectral data. It is of interest that these anthocyanins are isolated from this cultivar at a viewpoint of physiologically activity because such non- and mono acylated anthocyanins are absorbed directly in a small intestine after administration of colored sweetpotato.

Keywords : anthocyanin, sweetpotato, *Ipomoea batatas*, red sweetpotato, okiyumemurasaki

I Introduction

In recent days, natural colored foods with anthocyanins or carotenoids have been paid attention to promote human's healthy condition. Anthocyanins exhibited physiological functions including antioxidative[1-3], anti-inflammatory, antimutagenic[4], and anticarcinogenic activities[5, 6] etc. Sweetpotato cultivars with purple and red flesh were bred in the south-western region of Japan, mainly in Kyushu and Okinawa area. Chemical structures of six major anthocyanins from purple sweetpotato cultivars, 'Yamagawamurasaki' and 'Ayamurasaki' were previously clarified[7-11]. In the present paper, anthocyanins from red-flesh sweetpotato (so called beniimo in Japanese) cultivated in Okinawa islands are reported. Although 'Bise' is a major cultivar in Okinawan main island, 'Okiyumemurasaki' has been newly bred at Okinawa prefectural agricultural research center and registered as a new cultivar in Japan.

II Materials and Methods

1. Samples

The storage roots of the red sweet potato, *Ipomoea batatas* cv. okiyumemurasaki, and *I. batatas* cv. bise were obtained from Okinawa prefectural agricultural research center, experimental fields for the sweetpotato breeding at Itoman city in Okinawan main island.

2. Instrumentals

PDA-LCMS system was a Shimadzu LCMS-2020 system composed of a binary pump LC-20AD, online degasser DGU-20A$_5$, auto-sampler SIL-20AC$_{HT}$, column-oven CTO-20AC, photodiode array detector SPD-M20A, LCMS-2020, and LC-MS workstation LCMS solution (ver. 5.20). LC-ESIMS analyses were performed with equipped ODS column (Shim-pack VP-ODS, ϕ2.0 × 150 mm) at 40 °C with a flow rate of 0.2 mL/min monitoring at 190-800 nm for anthocyanins using a linear gradient system using solvent I [0.1 % (v/v) TFA aqueous solution] and solvent II [CH_3CN].

The solvent system consisted of a linear gradient from 5%II to 25%II for 50 min and isocratic elution (25%II) for the next 10min. MS spectra were measured by positive-mode electrospray ionization method. ^{1}H- and ^{13}C-NMR spectra were measured with a Varian spectrometer INOVA-500 (500 MHz for ^{1}H and 125 MHz for ^{13}C). ^{1}H- and ^{13}C-NMR

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