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NOTE

Two Phenolic Compounds from *Sarcopyramis bodinieri* var. Delicate

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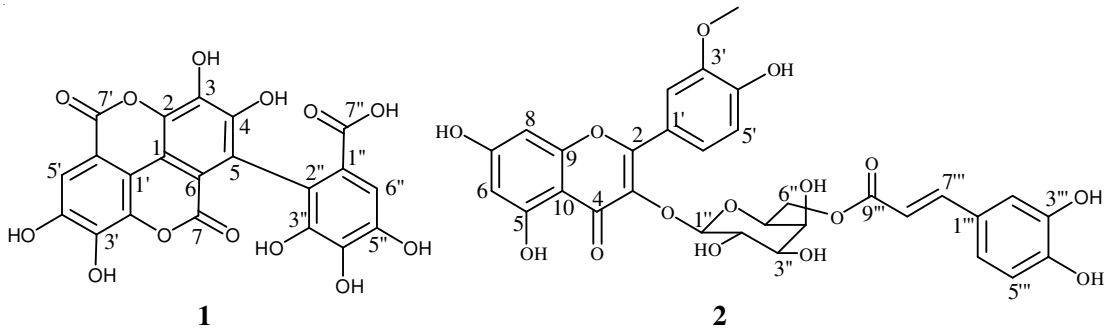
In continuation of the investigation of the chemical constituents of the herb of *Sarcopyramis bodinieri* var. delicate led to the isolation and identification of two phenolic compounds, namely, flavogallonic acid (**1**) and isorhamnetin-3-O-(6''-O-caffeoyl)-β-D-galactoside (**2**). Their structures were determined by the extensive spectroscopic analyses including UV, 1D NMR, 2D NMR and ESI-MS. The two phenolic compounds were isolated for the first time from the genus of *Sarcopyramis*.

Key Words: Chemical constituents, Phenolic compounds, *Sarcopyramis bodinieri* var. delicate.

Sarcopyramis bodinieri var. delicate belongs to the family of Melastomataceae and is widely cultured in Fujian province, China. In the folk medicine, *Sarcopyramis bodinieri* var. delicate is used to treat the liver and other inflammatory diseases (*i.e.*, acute and chronic hepatitis). Previously study has showed that the ethyl acetate extract of the plant was reported to demonstrate promising antioxidant and free radical scavenging activities *in vitro*[1]. In addition, we previously have made a fully investigation on the chemical constituents of this plant and more than twenty flavonoid and phenolic compounds were isolated, including two new flavonol glycosides[2-5]. In our ongoing search on this species, herein we have further isolated two phenolic compounds (**1** and **2**, Fig. 1) that were not reported in the genus of *Sarcopyramis* previously.

ESI-MS were recorded on 3200 Q-trap ESI-MS spectrometer (ABI, American). The ^{1}H, ^{13}C NMR and 2D-NMR spectra were recorded on a Bruker Avance-600 FT-NMR spectrometer, with TMS internal standard. A Shimadzu LC-20AT HPLC system was used to analyze the purity of the compounds. Column chromatography was performed on D101 macroporous resin (Cangzhou Bonchem Co., Ltd., China), silica gel (200-300 mesh, Qingdao Marine Chemical Inc., China), RP-ODS (50 μm) and Sephadex LH-20 (Pharmacia Co.). All of the organic solvents used were analytical grade and purchased from Sinopharm Chemical Reagent Co., Ltd. (Shanghai, China). The specimen of *S. bodinieri* var. delicate was collected from Fujian Province, P.R. China, in April 2007. A voucher specimen (RSC07) is deposited in our laboratory.

Extraction and isolation: The detailed extraction and isolation procedure was followed as reported earlier[3]. In brief, the air-dried plant material (10 kg) was grounded and extracted exhaustively by maceration at room temperature with EtOH-H_2O



1 **2**

Fig. 1. Structures of two phenolic compounds **1** and **2**

(70:30, 20 L × 3 L). The concentrated total extract (1.8 kg) was extracted with petroleum ether (PE), $CHCl_3$, EtOAc and *n*-BuOH, respectively. The EtOAc extract (SBC, 95 g) was suspended in H_2O (2 L) and the filter layer was then subjected to D-101 macroporous adsorption resin column, eluted with an equivalent H_2O-EtOH stepwise gradient to obtain 5 fractions. Fraction 2 (eluted with 30 % EtOH and labeled SBC-B, 44.4 g) was dissolved in the 20 % MeOH and the supernatant was subjected to RP-ODS column gradient eluted with MeOH-H_2O to afford 5 subfractions. Fr. SBC-B1 was subjected to Sephadex LH-20 column eluted with MeOH to give compound (**1**) (11.3 mg); fraction 3 (eluted with 50 % EtOH and labeled SBC-C, 13.76 g) was subjected to a Sephadex LH-20 column eluted with MeOH to give 6 subfractions. Fr.SBC-C3 was repeatedly chromatographed on RP-ODS column gradient eluted with MeOH-H_2O and then the repeated silica gel (200-300 mesh) column to give compound (**2**) (4.8 mg).

Spectral data: Flavogallonic acid (**1**) white amorphous powder; UV-visible (MeOH) λ_{max} = 364 and 256 nm; ESI-MS m/z: 469 $[M-H]^-$, 301 $[M-H\text{-Galloyl}]^-$; ^{1}H NMR (600 MHz, DMSO-d_6) δ: 7.49 (1H, s, H-5'), 6.96 (1H, s, H-6"); ^{13}C NMR (150 MHz, DMSO-d_6) δ: 166.56 (C-7"), 159.67 (C-7'), 159.64 (C-7), 150.06 (C-3), 148.98 (C-3'), 143.25 (C-3"), 140.07 (C-4, 2', 4'), 139.44 (C-5"), 137.11 (C-2), 136.79 (C-4"), 128.45 (C-5), 125.62 (C-1"), 122.65 (C-2"), 120.06 (C-6), 115.31 (C-6'), 114.49 (C-1), 112.47 (C-1'), 110.76 (C-5'), 108.52 (C-6"). The NMR data were consistent with the literature[6,7].

Isorhamnetin-3-O-(6''-O-caffeoyl)-β-D-galactoside (2): Yellowish amorphous powder; UV-VIS (MeOH) λ_{max} = 336, 252 nm; ESI-MS m/z: 639.3 $[M-H]^-$; ^{1}H NMR (600 MHz, DMSO-d_6) δ: 7.89 (1H, d, *J* = 2.0 Hz, H-2'), 7.58 (1H, dd, *J* = 8.5, 2.0 Hz, H-6'), 7.34 (1H, d, *J* = 15.9 Hz, H-7'"), 6.97 (1H, d, *J* = 1.7 Hz, H-2'"), 6.87 (1H, d, *J* = 8.5 Hz, H-5'), 6.80 (2H, m, H-5'", 6"'), 6.33 (1H, d, *J* = 2.0 Hz, H-8) , 6.17 (1H, d, *J* = 2.0 Hz, H-6), 6.04 (1H, d, *J* = 15.9 Hz, H-8"'), 5.35 (1H, d, *J* = 7.4 Hz, H-1"), 4.30 (2H, d, *J* = 4.5 Hz, H2-6"), 3.94 (3H, s, OCH_3), 3.51-3.45 (3H, m, H-2", 3", 5"), 3.37 (1H, m, H-4"). ^{13}C NMR (150 MHz, DMSO-d_6) δ: 121.9 (C-6'), 114.1 (C-5'), 112.2 (C-2'), 98.0 (C-6), 92.3 (C-8), 144.9 (C-7'"), 121.3 (C-6'"), 114.6 (C-5'"), 113.2 (C-2'"), 112.3 (C-8'"), 102.1 (C-1"), 75.9 (C-5"), 74.0 (C-2", 3"), 69.7 (C-4"), 62.2 (C-6"), 54.7 (OCH_3). The NMR data were consistent with the literature[8].

Compound **1** was isolated as a white amorphous powder. The UV spectrum showed two maximums absorption peak at 256 and 364 nm (Fig. 2). ^{1}H and ^{13}C NMR and MS spectra showed that compound **1** consisted of ellagic acid and gallic acid. Compound **1** was identified as flavogallonic acid on the basis of spectral analysis[6,7].

Compound **2** was isolated as a yellow powder. The UV spectrum showed two maximums absorption peak at 252 and 336 nm (Fig. 2). The ^{1}H NMR spectrum revealed a set of

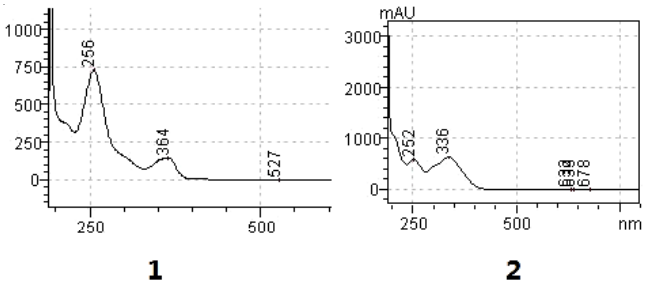


Fig. 2. UV spectra of two phenolic compounds **1** and **2**

isorhamnetin signals: two doublets at δ_H 6.17 (d, *J* = 2.0 Hz, H-6) and 6.33 (d, *J* = 2.0 Hz, H-8); an ABX spin system due to the aromatic ring at δ_H 6.87 (d, *J* = 8.5 Hz, H-5'), 7.58 (dd, *J* = 8.5, 2.0 Hz, H-6') and 7.89 (d, *J* = 2.0 Hz, H-2'); a methoxyl at δ_H 3.94 (s, 3'-OMe); a caffeoyl signals: 6.80 (2H, m, H-5'", 6"') and 6.97 (d, *J* = 1.7 Hz, H-2'"), together with two olefinic protons with a trans coupling constant (*J* = 15.9 Hz) at δ_H 6.04 (d, H-8"') and 7.34 (d, H-7"'); in addition, a glycopyranose moiety for an anomeric proton of a sugar at δ: 5.35 (1H, d, *J* = 7.4 Hz, H-1"). The coupling constant of *J* = 7.4 Hz indicated a β-configuration for the glycose moiety. The carbon signals at δ_C 102.1 (C-1"), 75.9 (C-5"), 74.0 (C-2", 3"), 69.7 (C-4") and 62.2 (C-6") revealed a galactopyranoside moiety[8]. The downfield shift of H2-6" to 4.30 were in accordance with the caffeoyl acylated at C-6" of the galactose moiety. The NMR data were good consistent with the literature[8]. The structure of compound **2** was therefore assigned as isorhamnetin-3-O-(6"-O-caffeoyl)-β-D-galactopyranoside.

In short, two phenolic compounds named flavogallonic acid (**1**) and isorhamnetin-3-O-(6"-O-caffeoyl)-β-D-galactoside (**2**) were isolated from the genus of *Sarcopyramis* for the first time.

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