SUPPLEMENTARY MATERIAL

A New Anthraquinone Glycoside from *Rhamnus nakaharai* and Anti-tyrosinase Effect of 6-Methoxysorigenin

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A New Anthraquinone Glycoside from *Rhamnus nakaharai* and Anti-tyrosinase Effect of 6-Methoxysorigenin

In continual study on the heartwood of *Rhamnus nakaharai*, a new alaternin-8-*O*-glucoside, namely 1,2,6,8-tetrahydroxy-3-methylanthraquinone-8-*O*- β -glucopyranoside (**1**), together with some known compounds were further isolated and characterized by 1D, 2D NMR and other spectral evidences. The free radical scavenging and anti-tyrosinase activities of the isolates including alaternin (**1a**), emodin (**2a**), emodin-8-*O*- β -glucopyranoside (**2**), 6-methoxysorigenin-8-*O*- β -glucopyranoside (**3**), and 6-methoxysorigenin (**3a**) were tested. Alaternin (**1a**) exhibited to be mild DPPH radical scavenger with half as potent as vitamin C, while both alaternin (**1a**) and emodin-8-*O*- β -glucopyranoside (**2**) exhibited stronger SOD-like activity than that of BHA. 6-Methoxysorigenin (**3a**), a reported potential antioxidant, and its 8-*O*-glucoside (**3**) both performed significant inhibitory effect on mushroom tyrosinase with about twice as potent as kojic acid, the positive control.

Keywords: alaternin; anthraquinone; glycoside; 6-methoxysorigenin; *Rhamnus nakaharai*; tyrosinase.

Figure S1-1: ^1H NMR spectrum of Alaternin-8-*O*-glucopyranoside (1)

Figure S1-2: ^{13}C NMR spectrum of Alaternin-8-*O*-glucopyranoside (1)

Figure S1-3: HMQC spectrum of Alaternin-8-*O*-glucopyranoside (1)

Figure S1-4: HMBC spectrum and key information of Alaternin-8-*O*-glucopyranoside (1)

Figure S1-5: FAB-MS spectrum of Alaternin-8-*O*-glucopyranoside (1)

File: PROTON

Solvent: CD3OD
Ambient temperature
Mercury-400BB "TaJen400"

Relax. delay 1.000 sec
Pulse 48.2 degrees
Acq. time 3.152 sec
Width 6410.3 Hz
1000 repetitions
OBSERVE H1, 400.2083229 MHz
DATA PROCESSING
Line broadening 0.1 Hz
FI size 65536
Total time 1 hr, 20 min, 34 sec

4.885

3.948
3.917
3.818
3.808
3.788
3.607
3.590
3.588
3.528
3.516
3.507
3.504
3.489
3.314
3.312
3.311
3.308
3.304
3.299
2.373
1.278

10.00
10.00
10.13
0.08
7.445
7.120
7.114
6.976
6.760
6.753

0 1 2 3 4 5 6 7 8 9 10 ppm

Solvent: CD3OD
Ambient temperature
Mercury-400BB "Jaden400"
Relax. delay 1.000 sec
Pulse 48.2 degrees
Acq. time 3.152 sec
Width 6410.3 Hz
1000 repetitions
OBSERVE H1, 400.2083229 MHz
DATA PROCESSING
Line broadening 0.1 Hz
FT size 65536
Total time 1 hr, 20 min, 34 sec

Figure S2-2: ^{13}C NMR spectrum of emodin-8-*O*-glucopyranoside (2)

Figure S2-3: DEPT pulse sequence spectrum of emodin-8-*O*-glucopyranoside (2)

up

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