FLAVONOIDS FROM *Litsea chingpingensis*

Xiao-dong Yang,[1] Li-juan Yang,[2] Shu Yang,[1,3] Jing-feng Zhao,[1] Hong-bin Zhang,[1] and Liang Li[1*]

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The genus *Litsea* (Lauraceae) is represented by 72 species in China, mostly growing in the south and southwestern parts of the country on mountains 1500 m above sea level or higher [1]. Most *Litsea* plants contain alkaloids, flavonoids, terpenes, lactones, and volatile oil constituents [2]. *Litsea* plants exhibit a variety of biological activities, including antimicrobial, hypothermic, and antitumor activities [3, 4]. To the best of our knowledge, no scientific study on *Litsea chingpingensis* has hitherto been reported.

The powdered leaves and twigs of *L. chingpingensis* (8.0 kg) were collected in Honghe, southwestern of China, in August 2005, and extracted with 95% ethanol (20 L × 4) at room temperature for 20 days. The alcohol extract was evaporated in vacuum at 50°C. The condensed solution was diluted with water and successively treated with ether, ethyl acetate, and *n*-butanol.

The ethyl acetate (20 g) was subjected to silica gel column chromatography. The column was continuously eluted with an ethyl acetate gradient in petroleum ether and fractions (1–5) were collected. Fraction 3 was purified by polyamide column chromatography and eluted with petroleum ether–ethyl acetate (60:1→0:1) to yield compound **1** (65 mg).

The *n*-butanol extract (80 g) was purified by silica gel column chromatography and eluted with a methanol gradient in chloroform to afford fractions (1–8). Fraction 4 was chromatographyed over polyamide column and eluted with chloroform–methanol (60:1→0:1) to isolate and purify compounds **2** (85 mg), **3** (58 mg), **4** (12 mg), **5** (26 mg), and **6** (35 mg). These compounds were identified using UV, IR, MS, and NMR spectra and by comparison with reported spectral data in the literature.

Luteolin (1), $C_{15}H_{10}O_6$, mp 328–330°C. UV spectrum (MeOH, λ_{max}, nm): 260, 274, 356. Negative FAB-MS spectrum (70 eV): *m/z* 285 $[M-1]^-$, 253, 223, 184, 165, 127. ^{1}H NMR (DMSO-d_6, 300 MHz, δ, ppm, J/Hz): 12.97 (1H, s, 5-OH), 7.42 (1H, dd, J = 8.1, J = 2.0, H-6′), 7.40 (1H, d, J = 2.0, H-2′), 6.87 (1H, d, J = 8.1, H-5′), 6.68 (1H, s, H-3), 6.43 (1H, s, H-8), 6.17 (1H, s, H-6) [5].

Kaempferol-3-*O*-β-D-glucopyranoside (2), $C_{21}H_{20}O_{11}$, mp 245–246°C. UV spectrum (MeOH, λ_{max}, nm): 268, 300, 312. Negative FAB-MS spectrum (70 eV): *m/z* 447 $[M-1]^-$, 339, 297, 284, 255, 239, 223, 211, 188, 166, 119, 77. ^{1}H NMR (DMSO-d_6, 300 MHz, δ, ppm, J/Hz): 12.63 (1H, s, 5-OH), 8.05 (2H, dd, J = 12.0, J = 2.8, H-2′, 6′), 6.89 (2H, dd, J = 12.0, 2.8, H-3′,5′), 6.42 (1H, d, J = 2.0, H-8), 6.20 (1H, d, J = 2.0, H-6), 5.54 (1H, d, J = 7.6, Glc-1), 3.35–3.80 (m, glucose protons) [5].

Kaempferol-7-*O*-β-D-glucopyranoside (3), $C_{21}H_{20}O_{11}$, mp 195–196°C. UV spectrum (MeOH, λ_{max}, nm): 268, 301, 312. Negative FAB-MS spectrum (70 eV): *m/z* 447 $[M-1]^-$, 339, 297, 284, 255, 239, 211, 188, 166, 119, 77. ^{1}H NMR (DMSO-d_6, 300 MHz, δ, ppm, J/Hz): 12.61 (1H, s, 5-OH), 8.04 (2H, dd, J = 12.0, J = 2.8, H-2′, 6′), 6.90 (2H, dd, J = 12.0, 2.8, H-3′,5′), 6.85 (1H, d, J = 2.0, H-8), 6.45 (1H, d, J = 2.0, H-6), 5.47 (1H, d, J = 7.6, Glc-1), 3.38–3.82 (m, glucose protons) [6].

Quercetin-3-*O*-α-L-rhamnopyranoside (4), $C_{21}H_{20}O_{11}$, mp 184–185°C. UV spectrum (MeOH, λ_{max}, nm): 258, 300, 355. Negative FAB-MS spectrum (70 eV): *m/z* 447 $[M-1]^-$, 317, 285, 273, 169, 135, 119, 77. ^{1}H NMR (DMSO-d_6, 300 MHz, δ, ppm, J/Hz): 12.66 (1H, s, 5-OH), 7.29 (1H, dd, J = 8.2, J = 2.0, H-6′), 7.24 (1H, dd, J = 2.0, H-2′), 6.85 (1H, dd, J = 8.2, H-5′), 6.38 (1H, d, J = 2.0, H-8), 6.20 (1H, d, J = 2.0, H-6), 5.25 (1H, d, J = 7.2, Rha-1), 3.18–3.92 (m, rhamnose protons), 1.45 (3H, s, J = 2.0 Hz, Rha-6) [7].

1) Key Laboratory of Medicinal Chemistry for Natural Resource (Yunnan University), Ministry of Education, School of Chemical Science and Teleology, Yunnan University, Kunming 650091, P. R. China, fax: 86 871 5035538, e-mail: xdyang120@hotmail.com; 2) College of Chemistry and Bio-Science, Yunnan Nationalities University, Kunming 650031, P. R. China; 3) College of Fundamental and Information Engineering, Yunnan Agricultural University, Kunming 650201, P. R. China. Published in Khimiya Prirodnykh Soedinenii, No. 5, pp. 519-520, September-October, 2008. Original article submitted March 30, 2007.

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Quercetin-3-*O*-*β*-D-glucopyranoside (5), $C_{21}H_{20}O_{12}$, mp 244–246°C. UV spectrum (MeOH, λ_{max}, nm): 256, 301, 357. Negative FAB-MS spectrum (70 eV): *m/z* 463 $[M-1]^-$, 301, 285, 273, 169, 135, 119, 77. ^{1}H NMR (DMSO-d_6, 300 MHz, δ, ppm, J/Hz): 12.65 (1H, s, 5-OH), 7.78 (1H, dd, J = 8.2, J = 2.0, H-6′), 7.29 (1H, dd, J = 2.0, H-2′), 7.13 (1H, dd, J = 8.2, H-5′), 6.65 (1H, d, J = 2.0, H-6), 6.43 (1H, d, J = 2.0, H-8), 5.45 (1H, d, J = 7.2, Glc-1), 3.22–3.81 (m, glucose protons) [8].

Luteolin-7-*O*-*β*-D-glucopyranoside (6), $C_{21}H_{20}O_{11}$, mp 256–258°C. UV spectrum (MeOH, λ_{max}, nm): 254, 268, 349. Negative FAB-MS spectrum (70 eV): *m/z* 447 $[M-1]^-$, 300, 286, 270, 168, 144, 114, 98, 77. ^{1}H NMR (DMSO-d_6, 300 MHz, δ, ppm, J/Hz): 12.96 (1H, s, 5-OH), 7.42 (1H, dd, J = 8.3, J = 2.2, H-6′), 7.40 (1H, dd, J = 2.2, H-2′), 6.91 (1H, dd, J = 8.3, H-5′), 6.81 (1H, d, J = 2.1, H-8), 6.75 (1H, s, H-3), 6.46 (1H, d, J = 2.1, H-6), 5.01 (1H, d, J = 7.2, Glc-1), 3.18–3.77 (m, glucose protons) [9].

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