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Fitoterapia 78 (2007) 76 – 78

FITOTERAPIA

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Phytochemical communication

Monoterpene glycosides from *Paeonia delavayi*

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Received 6 April 2006; accepted 7 September 2006
Available online 23 September 2006

Abstract

A new monoterpene glycoside, 4-*O*-methyl-4″-hydroxy-3″-methoxy-paeoniflorin (**1**), was isolated from the root cortex of *Paeonia delavayi* along with the known paeoniflorin, oxypaeoniflorin, benzoylpaeoniflorin, benzoyloxypaeoniflorin, albiflorin and a paeonilactone-A.
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Keywords: *Paeonia delavayi*; Monoterpenoids; Spectroscopic methods; 4-*O*-methyl-4″-hydroxy-3″-methoxy-paeoniflorin

1. Plant

Paeonia delavayi Franch. (Paeoniaceae), roots collected from Lijiang County of Yunnan Province in August 1998, were identified by Mr. Zheng-Wei Lu, Kunming Institute of Botany, The Chinese Academy of Sciences, Kunming, Yunnan, where a voucher specimen is deposited.

2. Uses in traditional medicine

The root cortex, one of the main sources of Chinese traditional medicine “mudanpi”, is used as an analgesic, sedative and antiinflammatory agent and also a remedy for cardiovascular, extravasated blood, stagnated blood and female diseases in traditional oriental medicine [1–3].

3. Previously isolated classes of constituents

Monoterpenoids [4] and triterpenoids [4–6].

4. New isolated constituents

4-*O*-methyl-4″-hydroxy-3″-methoxy-paeoniflorin (**1**, yield: 0.0021%), paeoniflorin (**2**, 0.0065%), oxypaeoniflorin (**3**, 0.0037%), benzoylpaeoniflorin (**4**, 0.0013%) [7,8], benzoyloxypaeoniflorin (**5**, 0.0015%) [1], albiflorin (**6**, 0.0018%) [8] and paeonilactone-A (**7**, 0.0009%) [9] (Fig. 1).

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0367-326X/$ - see front matter © 2006 Elsevier B.V. All rights reserved.
doi:10.1016/j.fitote.2006.09.014

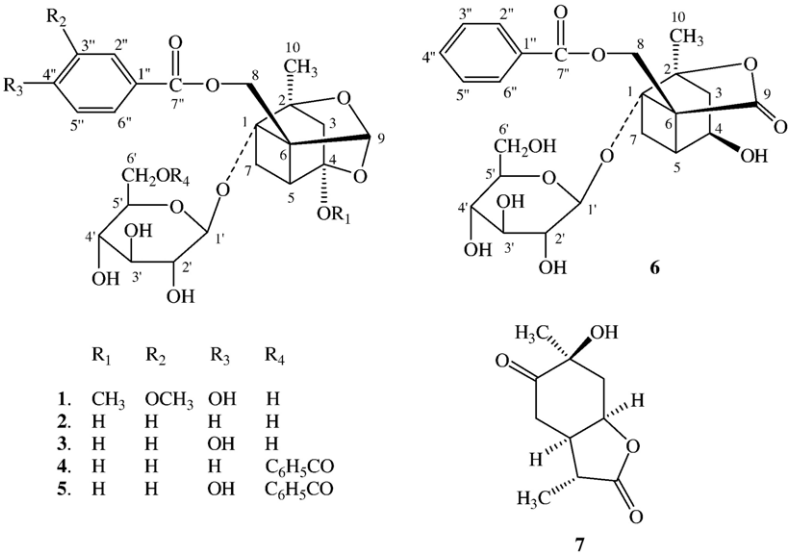

Fig. 1. Compounds **1**–**7**.

4-*O*-methyl-4″-hydroxy-3″-methoxy-paeoniflorin (**1**): Viscous oil; $[\alpha]_D^{18}$ −13.6 (c 0.4, MeOH); UV max (MeOH): 202.0 (log ε 4.10), 228.5 (4.22), 265.0 (2.65), 283.5 (3.47) nm; IR bands (KBr): 3418, 2923, 2859, 1710, 1460, 1377, 1284, 1221, 1076, 764, 720 cm^{-1}; Negative FAB-MS: *m/z* 539 $[M-1]^-$ (100%), 509 $[M-OCH_3]^-$ (17), 377 (6),

Table 1
^1H and ^{13}C NMR data for compound **1** (500 MHz, in pyridine-d_5, *J* in Hz, δ in ppm)

C	δ_H	δ_C	HMBC
1	–	88.68	H-5, 7, 8, 10, 1′
2	–	86.10	H-3, 7, 9, 10
3	2.16 (2H, *s*)	41.97	H-5, 10
4	–	108.51	H-3, 5, 7, 9, 4–OC$\underline{H}_3$
5	3.07 (1H, *d*, *J*=6.7)	40.54	H-7, 8
6	–	71.43	H-5, 8, 9
7α	2.84 (1H, *dd*, *J*=11.0, 6.7)	23.49	H-7α/7β
7β	2.14 (1H, *d*, *J*=11.0)		
8a	5.13 (1H, *d*, *J*=12.0)	60.87	H-5, 9
8b	5.10 (1H, *d*, *J*=12.0)		
9	5.87 (1H, *s*)	102.02	H-8
10	1.64 (3H, *s*)	19.85	H-3
1′	5.17 (1H, *d*, *J*=7.8)	100.58	H-2′
2′	4.03 (1H, *m*)	75.07	H-3′
3′	4.21 (1H, *m*)	78.71	H-2′, 4′
4′	4.16 (1H, *m*)	71.82	H-3′, 5′
5′	3.92 (1H, *m*)	78.59	H-4′, 6′
6′a	4.54 (1H, *dd*, *J*=11.5, 1.9)	62.92	H-4′, 5′
6′b	4.31 (1H, *dd*, *J*=11.5, 5.7)		
1″		121.45	H-2″, 5″
2″	7.83 (1H, *d*, *J*=1.5)	113.49	H-6″
3″		148.42	H-2″, 5″, 3″–OC$\underline{H}_3$
4″		153.40	H-2″, 5″, 6″
5″	7.14 (1H, *d*, *J*=8.2)	116.27	
6″	7.92 (1H, *dd*, *J*=8.2, 1.5)	124.79	H-2″, 5‴
7″		166.76	H-8, 2″, 6″
4–OCH_3	3.42 (3H, *s*)	51.01	
3″–OCH_3	3.70 (3H, *s*)	55.79	

339 (16), 325 (24), 311 (15), 265 (5), 167 (16), 121 (21); Negative HRFAB-MS: *m/z* $[M-1]^-$ 539.2483 (calcd. for $C_{25}H_{32}O_{13}$, 540.2467); ^1H NMR and ^{13}C NMR data: see Table 1.

Acknowledgement

The authors are grateful to the analytical group of the Laboratory of Phytochemistry, Kunming Institute of Botany, Chinese Academy of Sciences, for the spectral measurements.

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