

A New 8',9'-Dinor 8,4'-Oxyneolignan Glucoside from *Dendrobium aurantiacum* var. *Denneanum*

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Abstract: An investigation of *n*-BuOH extract of *Dendrobium aurantiacum* var. *denneanum* stems has led to the isolation of a new 8',9'-dinor 8,4'-oxyneolignane glucoside, (–)-(7*S*,8*S*)-4-hydroxy-3,3',5,5'-tetramethoxy-8',9'-dinor-8,4'-oxyneolignane-7,9-diol-7'-al 4-*O*-β-D-glucopyranoside (**1**), and four phenylpropanoid glycosides (**2–5**). The structures of the isolated compounds were elucidated by chemical and spectroscopic methods. This is the first report of norlignane from the genus *Dendrobium*.

Keywords: *Dendrobium aurantiacum* var. *denneanum*; norlignane; oxyneolignan glucoside; phenylpropanoid glycoside. © 2015 ACG Publications. All rights reserved.

1. Plant Source

Dendrobium, a well-known genus of Orchidaceae family, is composed of more than 1100 species and widely distributed throughout Asia, Europe, and Australia [1]. *Dendrobium aurantiacum* Rchb. f. var. *denneanum* (Kerr.) Z. H. Tsi is used as “shihu” or “huangcao” in traditional or folk Chinese medicine for its antipyretic, eye-benefiting and immunomodulatory effects [2]. The stems of this plant were collected from the culture field in Shuangliu, Sichuan Province, China in April 2011. Prof. Dr. Min Li identified the species and the voucher specimen (SSF-20110410) was deposited at the School of Pharmacy, Chengdu University of TCM, Chengdu, China.

2. Previous Studies

So far, a lot of bibenzyls, phenanthrenes, fluorenones, phenylpropanoids, flavones, coumarins, lignans, and esters of aromatic acids have been isolated from the plant and other species of *Dendrobium* [3–8]. However, there is no reports of norlignans in genus *Dendrobium*. This paper

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optical rotation $[\alpha]_D^{20} +46.0^\circ$ [17] and TLC comparison with the authentic sugar sample. In the CD spectra of **1a**, a positive Cotton effect at 244 nm ($\Delta\epsilon +0.38$) suggested 8*S* configuration for **1** [18]. Therefore, compound **1** was determined to be (–)-(7*S*,8*S*)-4-hydroxy-3,3',5,5'-tetramethoxy-8',9'-dinor-8,4'-oxyneoligna-7,9-diol-7'-al 4-O- β -D-glucopyranoside.

Table 1. ^1H (600 MHz) and ^{13}C NMR (150 MHz) data for compound **1** in CD_3OD (δ in ppm, J in Hz).

Position	δ_{C}	δ_{H} (mult., J in Hz)	HMBC (H \rightarrow C)
1	139.3	–	–
2	105.6	6.79 (s)	C-1, C-3, C-4, C-6, C-7
3	153.8	–	–
4	135.7	–	–
5	153.8	–	–
6	105.6	6.79 (s)	C-1, C-2, C-4, C-5, C-7
7	73.9	5.02 (d, $J = 5.4$ Hz)	C-1, C-2, C-6, C-8, C-9
8	87.7	4.49 (m)	C-1, C-7, C-4'
9a	62.2	3.84 (m)	C-7, C-8
9b		3.54 (dd, $J = 12.0, 4.8$ Hz)	
1'	133.7	–	–
2'	107.9	7.22 (s)	C-1', C-3', C-4', C-6', C-7'
3'	154.7	–	–
4'	143.5	–	–
5'	154.7	–	–
6'	107.9	7.22 (s)	C-1', C-2', C-4', C-5', C-7'
7'	193.0	9.83 (s)	C-1', C-2', C-6'
1''	105.6	4.77 (d, $J = 7.2$ Hz)	C-4, C-3''
2''	75.8	3.46 (m)	C-1'', C-4''
3''	77.7	3.41 (m)	C-1'', C-2'', C-4'', C-5''
4''	71.3	3.40 (m)	C-2'', C-3'', C-6''
5''	78.4	3.20 (m)	C-3'', C-4''
6''a	62.6	3.78 (dd, $J = 12.6, 2.4$ Hz)	C-4''
6''b		3.67 (dd, $J = 12.6, 6.0$ Hz)	
3/5-OMe	56.9	3.82 (s)	C-3/5
3'/5'-OMe	56.8	3.89 (s)	C-3'/5'

Supporting Information

Supporting Information accompanies this paper on <http://www.acgpubs.org/RNP>

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