Supporting Information to:

Two New Spirobiflavonoids from *Abies chensiensis* with Moderate NO Production Inhibitory Activity

Yong-Li Li¹, Xian-Wen Yang², Su-Mei Li², Jian Tang¹, Jun-Mian Tian¹, Xiao-Yang Peng¹, Da-Seng Huang¹, Wei-Dong Zhang¹,³

**Affiliation**

¹ Department of Natural Product Chemistry, School of Pharmacy, Second Military Medical University, Shanghai, P.R. China
² Key Laboratory of Marine Bio-resources Sustainable Utilization, South China Sea Institute of Oceanology, Chinese Academy of Sciences, Guangzhou, P.R. China
³ School of Pharmacy, Shanghai Jiao Tong University, Shanghai, P.R. China

**Correspondence**

*Dr. Wei-Dong Zhang*

Department of Natural Product Chemistry

School of Pharmacy

Second Military Medical University

325 Guohe Road

Shanghai 200433

People’s Republic of China

Tel.: +86-21-8187-12446

Fax: +86-21-8187-1244

wdzhangy@hotmail.com
Instruments and chemicals
NMR spectra were recorded on a Bruker Avance 600 NMR spectrometer in CD$_3$OD with TMS as internal standard. ESI-MS were acquired on an Agilent LC/MSD Trap XCT mass spectrometer, whereas HR-ESI-MS were measured using a Q-TOF micro-mass spectrometer (Waters). Optical rotations were recorded using a Perkin-Elmer 341 polarimeter, whereas UV spectra were obtained by a Shimadzu UV-2550 UV-vis spectrometer. IR spectra were recorded on a Bruker Vector 22 spectrometer with KBr pellets. Materials for CC were silica gel (100–200 mesh; Huiyou Silical Gel Development Co. Ltd.), Sephadex LH-20 ($40–70 \mu m$; Amersham Pharmacia Biotech AB), and YMC-GEL ODS-A ($50 \mu m$; YMC). Preparative TLC (0.4–0.5 mm) was conducted with glass precoated silica gel GF$_{254}$ (Yantai).

Plant material
The aerial parts of *A. chensiensis* were collected from Shaanxi Province, P.R. China, in May 2007 and authenticated by Han-Ming Zhang of the Department of Pharmacognosy, Second Military Medical University. A voucher specimen (20070513002) was deposited at the Herbarium of the School of Pharmacy, Second Military Medical University, Shanghai, P.R. China.

Isolation procedures
The air-dried and powdered aerial parts (17 kg) of *A. chensiensis* were extracted with 80% ethanol three times for 3 h each. After the resins were filtered out, the extract was partitioned sequentially with CHCl$_3$ (20 L), EtOAc (40 L), and $n$-BuOH (30 L), respectively. The EtOAc extract (400 g) of *A. chensiensis* was subjected to column chromatography (CC) over silica gel (4 kg, 100–200 mesh, 30 × 70 cm) using gradient CHCl$_3$–MeOH (100:0, 50:1, 20:1, 10:1, 5:1, 2:1, 1:1, each 15 L) to yield four fractions (Fr. 1–Fr. 4). Fr. 1 was chromatographed on a silica gel column (6 × 40 cm) with CHCl$_3$–MeOH (30:1, 20:1, 10:1) to yield 4 (20 mg), 5 (15 mg), and 6 (12 mg). Fr. 2 was subjected to silica gel column chromatography (6 × 40 cm) using CHCl$_3$–MeOH (10:1) to give 7 (18 mg), 8 (16 mg), and 9 (8 mg). Fr. 3 was subjected to CC over ODS (4.5 × 46 cm) eluting with MeOH–H$_2$O (20–50%), followed by Sephadex LH-20 (3 × 150 cm) eluting with MeOH to get 1 (26 mg), 2
(90 mg), 3 (6 mg), 10 (40 mg), 11 (100 mg), 12 (10 mg), 13 (20 mg), 16 (9 mg), 17 (4 mg), and 19 (12 mg). Fr. 4 was subjected to CC over Sephadex LH-20 (3 × 150 cm) eluting with MeOH, followed by purification by preparative TLC with CHCl₃–MeOH (4:1) to afford 14 (50 mg), 15 (25 mg), 18 (12 mg), 20 (20 mg), 21 (20 mg), 22 (19 mg), 23 (16 mg), 24 (12 mg), 25 (28 mg), 26 (22 mg), 27 (5 mg), 28 (40 mg), and 29 (25 mg). The purities of these compounds ranged from 91.5% to 98.7% as determined by HPLC.
Fig. 1S Chemical structures of compounds 4–29.