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TETRAHYDROFURAN LIGNANS AND FLAVONOIDS FROM *Artemisia absinthium*[a]

Ning-Juan Chi,[1,2] Yongqiang Liu,[1] and Haji Akber Aisa[1*]

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Artemisia absinthium L. (wormwood), a perennial herb, belongs to the *Artemisia* genus of the Compositae family and is widely distributed throughout Asia, Europe, America, and Africa. The plant is used for the treatment of parasite, anorexia, and indigestion [1]. There are studies previously reported that sesquiterpene lactones, flavonoids, and lignans are present in this species, and the root of this plant has been shown to possess sesamin-type bioactive lignans [2, 3]. In our investigation on the bioactive constituents of *A. absinthium*, six known tetrahydrofuran lignans and two known flavonoids were isolated from the aerial part of this plant. They are epiashantin (**1**), sesartemin (**2**), diayangambin (**3**), epiyangambin (**4**), caruilignan C (**5**), (+)-arborone (**6**), artemetine (**7**), and chrysosplenetin B (**8**). Their structures were elucidated by MS and 1D and 2D NMR spectroscopy, as well as comparison with the literature data. Compound **5** was first isolated from this plant, and compound **6** was first isolated from this genus.

The air-dried aerial part of *A. absinthium* (2.7 kg) was finely powdered and extracted with 70% (v/v) aqueous ethanol at room temperature. The extract was suspended in water and partitioned with PE (petroleum ether), CH_2Cl_2, EtOAc, and *n*-BuOH, successively. The CH_2Cl_2 fraction (42 g) was subjected to column chromatography on silica gel using PE–EtOAc (10:0 to 5:1) and CH_2Cl_2–MeOH (100:0 to 5:1) as the mobile phase to give 10 fractions (I–X). Fraction V was chromatographed on a Sephadex LH-20 column eluted with $CHCl_3$–MeOH (1:1) and then purified on silica gel and Sephadex LH-20 columns to afford compound **1** (15 mg), **2** (5 mg), **3** (65 mg), **4** (60 mg), **5** (5 mg), **6** (4 mg), **7** (5 mg), and **8** (120 mg).

Epiashantin (1). $C_{22}H_{24}O_7$, ESI-MS *m/z* 423 $[M + Na]^+$ [3, 4].

Sesartemin (2). $C_{23}H_{26}O_8$, ESI-MS *m/z*: 453 $[M + Na]^+$, 431 $[M + H]^+$ [3, 4].

Diayangambin (Lirioresinol-C dimethyl ether) (3). $C_{24}H_{30}O_8$, ESI-MS *m/z*: 469 $[M + Na]^+$, 447 $[M + H]^+$ [3–5].

Epiyangambin (Lirioresinol-A dimethyl ether) (4). $C_{24}H_{30}O_8$, ESI-MS *m/z*: 469 $[M + Na]^+$, 447 $[M + H]^+$ [3–5].

Caruilignan C (5). $C_{15}H_{18}O_6$, ESI-MS *m/z* 318 $[M + Na]^+$. PMR spectrum (400 MHz, $CDCl_3$, δ, ppm, J/Hz): 6.51 (2H, s, H-2, H-6), 4.96 (1H, d, J = 5.2, H-7), 4.54 (1H, d, J = 9.6, H-9β), 4.09–4.13 (1H, m, H-9′β), 3.99 (1H, dd, J = 9.2, 6.8, H-9α), 3.87 (6H, s, MeO-3, MeO-5), 3.86 (3H, s, MeO-4), 3.84 (1H, d, J = 3.6, H-9′α), 3.38–3.41 (2H, m, H-8, H-8′) [6].

(+)-Arborone (6). $C_{24}H_{30}O_9$, ESI-MS *m/z*: 485 $[M + Na]^+$, 463 $[M + H]^+$. PMR spectrum (400 MHz, $CDCl_3$, δ, ppm, J/Hz): 7.44 (2H, s, H-2′, H-6′), 6.55 (2H, s, H-2, H-6), 5.02 (1H, d, J = 6.0, H-7), 4.43 (1H, t, J = 8.0, H-9′β), 4.33 (1H, m, H-8′), 4.27 (1H, dd, J = 8.0, 2.8, H-9′α), 3.94 (3H, s, MeO-4′), 3.93 (6H, s, MeO-3′, MeO-5′), 3.85 (6H, s, MeO-3, MeO-5), 3.84 (3H, s, MeO-4), 3.44 (2H, d, J = 6.4, H-9), 2.91(1H, m, H-8) [7].

Artemetine (7). Yellow amorphous powder. PMR (400 MHz, $CDCl_3$) and ^{13}C NMR (100 MHz, $CDCl_3$) spectroscopic data were in good agreement with the literature data [8, 9].

Chrysosplenetin B (8). Yellow amorphous powder, ESI-MS *m/z* 375 $[M + H]^+$. PMR (400 MHz, $CDCl_3$) and ^{13}C NMR (100 MHz, $CDCl_3$) spectroscopic data were in good agreement with the literature data [8, 9].

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1) Key Laboratory of Plant Resources and Chemistry in Arid Regions, Xinjiang Technical Institute of Physics and Chemistry, Chinese Academy of Sciences, 830011, Urumqi, P. R. China, fax: (86991) 383 56 79, e-mail: haji@ms.xjb.ac.cn; 2) Graduate School of the Chinese Academy of Sciences, 100039, Beijing, P. R. China. Published in *Khimiya Prirodnykh Soedinenii*, No. 4, July–August, 2012, p. 597. Original article submitted March 5, 2012.

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