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A NEW LIGNAN FROM *Saururus chinensis*

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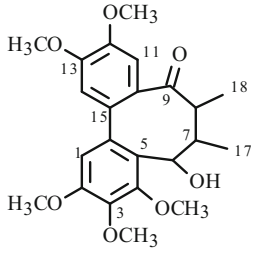
Saururus chinensis (Lour.) Baill (Saururaceae) has been used in Chinese folk medicine for treatment of various diseases such as edema, jaundice, and gonorrhea, and as antipyretic, diuretic, and anti-inflammatory agents [1]. *S. chinensis* was reported to contain compounds such as lignans, including six types: dibenzylbutane lignans, monoepoxylignans (substituted tetrahydrofurans), sauchinone-type lignans, alkyl aryl ether neolignans, sesquineolignans, and dineolignans; dibenzylbutane lignans: 2′-hydroxydihydroguaiaretic acid [2], meso-dihydroguaiaretic acid [3], austrobai1ignan-5 [4], erythro-austrobailignan-6, (+)-saururinone [5], and saururin A [6]; monoepoxylignans (substituted tetrahydrofurans): rel-(8*R*,8′*R*)-dimethyl-(7*S*,7′*R*)-bis (3,4-methylenedioxyphenyl)tetrahydrofuran, nectandrin B [5], (+)-saucernetin [7], galbacin [8], and di-*O*-methyltetrahydrofuriguaiacin B [9]; alkyl aryl ether neolignans: machilin D [2] and virolin [6, 9]; sesquineolignans: saucerneols A-C [9], saucerneols D and E, (–)-saucerneol methyl ether [7], and (–)-saucerneol [10]; dineolignans: 4-*O*-demethylmanassantin A, 4-*O*-demethylmanassantin B [11], manassantins A and B [12–14], saucernetin-7 [15, 16], saucernetin-8 [17], threo,erythro-manassantin A, and erythro,erythro-manassantin A [18]; sauchinone-type lignans: sauchinone, sauchinone A, 1′-*epi*-sauchinone [8], *ent*-sauchinone [19], and sauchinone B [5].

The herbs of *S. chinensis* were purchased at the local herb-drug store and identified as *S. chinensis* with the assistance of Prof. M. L. Deng of the Department of Pharmacy, Changchun University of Chinese Medicine.

The dried herbs *S. chinensis* (5 kg) were extracted twice with aq. 70% EtOH under reflux. The extract was concentrated until the weight ratio (EtOH–dried herb) was 1:1 and left to stand at room temperature overnight; brown yellow precipitates were obtained after filtration of the solution and drying the precipitates at 55°C, yielding 105 g of residue. The residue was applied to a silica gel column and eluted by petroleum ether–EtOAc, 20:1→3:1, to get 10 fractions. The fractions were combined to give five parts (F1-F5) according to TLC check. F5 (3 g) was subjected to silica gel column chromatography using petroleum ether–EtOAc (4:1) and purified by HPLC to get saururine A (29.5 mg).



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Herein, we report the isolation of a new lignan, saururine A. Saururine A was isolated as a white powder. The molecular formula was established as $C_{23}H_{28}O_7$ on the basis of the HR-ESI-MS molecular ion peak at *m/z* $[M + H]^+$ 417.1907 (calcd 417.1913, Δ+0.8 mmu). ^1H and ^{13}C NMR data were very similar to those of schisantherin Q [20] except for the different substituent of the bisphenyl system. The ^1H NMR spectrum showed the presence of two secondary methyls (δ 1.87 (3H, d, J = 6.4 Hz, Me-18), 1.55 (3H, d, J = 6.8 Hz, Me-17), three aromatic protons (δ 7.51, 7.50, 6.53), and five methoxyls (δ 3.92, 3.88, 3.88, 3.75, 3.75). The ^{13}C NMR and DEPT spectra exhibited 18 carbon atoms (including 12 aromatic ones, an oxymethine, a ketone, and two secondary methyls) for the dibenzocyclooctadiene skeleton, in addition to five methoxyl groups. The ^1H and ^{13}C signal assignments were supported by COSY, HSQC, and HMBC experiments. Thus, compound was defined as 2,3,4,12,13-methoxy-6-hydroxy-8,1-dibenzocyclooctadiene, saururine A.

The main class of compounds isolated from this species is lignans, which can be divided into five types on the basis of the carbon framework: dibenzylbutane lignans, monoepoxylignans (substituted tetrahydrofurans), alkyl aryl ether neolignans, sesquineolignans, and dineolignans. To the best of our knowledge, saururine A is the first dibenzocyclooctadiene-type lignan isolated from *S. chinensis*. This suggests that the presence of dibenzocyclooctadiene lignan can be considered as a chemosystematic marker for this species. This observation might have some chemotaxonomic implications in this species.

Saururine A, white powder; ^1H NMR (500 MHz, CD_3OD, δ, ppm, J/Hz): 1.87 (3H, d, J = 6.4, Me-18), 1.55 (3H, d, J = 6.8, Me-17), 3.49 (H-6), 1.59 (H-7), 2.40 (H-8), 3.92 (3H, s, OMe), 3.88 (6H, s, OMe), 3.75 (6H, s, OMe), 7.51 (H-14), 7.50 (H-1), 6.53 (H-11); ^{13}C NMR (125 MHz, CD_3OD, δ): 197.4 (C-9), 153.2 (C-12), 152.8 (C-3), 142.5 (C-2), 134.6 (C-4), 134.1 (C-13), 130.8 (C-10), 130.5 (C-5), 125.5 (C-15, C-16), 107.1 (C1, C-14), 102.8 (C-11), 80.7 (C-6), 60.9 (OMe), 56.2 (OMe, overlapped), 55.9 (OMe, overlapped), 18.3 (C-17), 17.9 (C-18), 50.8 (C-7), 31.9 (C-8); HR-ESI-MS *m/z* 417.1907 (calcd for $C_{23}H_{28}O_7$, 417.1913).

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