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GOSSYPIFAN, A LIGNAN FROM *JATROPHA GOSSYPIFOLIA**†

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Key Word Index—*Jatropha gossypifolia*; Euphorbiaceae; lignan; gossypifan.

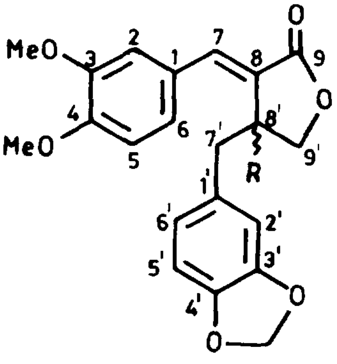
Abstract—A new lignan, gossypifan, isolated from a petrol extract of the aerial parts of *Jatropha gossypifolia* has been characterized as α-(*trans*-3,4-dimethoxybenzylidene)-β-*S*-(3,4-methylenedioxybenzyl)-γ-butyrolactone by spectroscopic methods.

INTRODUCTION

Jatropha gossypifolia is a small shrub distributed throughout India. Various medicinal and pesticidal properties [1–5] have been attributed to this species. Its most important applications have been reported to be in the treatment of cancerous growths [3] and as an insecticide [4]. Different parts of the plant have previously been chemically examined and a review [5] on its chemical constituents has shown that it contains mainly lignans and diterpenoids. Herein, we now report on the isolation and characterization of a new lignan, gossypifan (**1a**), isolated from a petrol extract of the aerial parts of *J. gossypifolia*.

RESULTS AND DISCUSSION

Gossypifan (**1a**) was isolated as needles. Its spectral properties (IR, ^{1}H and ^{13}C NMR, and mass spectrum) showed similarities with those of chisulactone (**1b**), previously isolated [6, 7] from *Polygala chinensis*. The compound **1b** was also reported from *Chaerophyllum maculatum* [8], *Bupleurum salicifolium* [9] and *B. lanceolatum* [10] with the name of kaerophyllin (chaerophyllin). We have observed that lignans **1a** and **1b** possess opposite optical rotations and so they must differ in their steric configurations at C-8′. As the compound **1b** has been proved [10] to exhibit the 8′*R*-configuration, the stereochemistry of gossypifan must be 8′*S*. Similar stereochemistry was also observed in the lignans, jatrophan [11] and gadain [12], previously reported from the title species. Thus, the structure of the new lignan, gossypifan (**1a**) can be defined as α-(*trans*-3,4-dimethoxybenzylidene)-β-*S*-(3,4-methylenedioxybenzyl)-γ-butyrolactone.



	R
1a	α-H
1b	β-H

EXPERIMENTAL

General. Mp: uncorr. CC: silica gel (BDH, 100–200 mesh). TLC: silica gel G, spots were visualized by exposure to I_2 vapour.

Plant material. Aerial parts of *J. gossypifolia*. L. were collected from West Bengal, India, in 1993. A voucher specimen (JG-A) has been preserved in our laboratory.

Isolation of gossypifan (**1a**). Air-dried and finely milled aerial parts (3 kg) were exhaustively extracted with petrol (60–80°) in a Soxhlet apparatus for 72 hr. The extract was concd and chromatographed over silica gel, the column being eluted with solvents of increasing polarity. Earlier frs of benzene yielded a mixt. of sitosterol and gossypifan

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(**1a**) which were separated by repeated CC and, finally, compound **1a** was recrystallized from benzene as colourless needles, yield 14 mg. Mp 145–146°. $[\alpha]_D^{25}$ + 82.4 ($CHCl_3$: *c* 0.8753). UV ν_{max}^{EtOH} nm (log ε): 334, 296, 288, 235 (4.22, 3.97, 4.01, 4.18). IR ν_{max}^{KBr} cm^{-1}: 1725, 1630, 1590, 1485, 1190, 910. ^{1}H NMR (200 MHz, $CDCl_3$): δ7.49 (1H, *d*, $J = 1.6$ Hz, H-7), 7.08 (1H, *dd*, $J = 8.0$ and 1.5 Hz, H-6), 7.06 (1H, *d*, $J = 1.5$ Hz, H-2), 6.86 (1H, *d*, $J = 8.0$ Hz, H-5), 6.80 (1H, *d*, $J = 8.0$ Hz, H-5′), 6.73 (1H, *dd*, $J = 8.0$ and 1.5 Hz, H-6′), 6.70 (1H, *d*, $J = 1.5$ Hz, H-2′), 6.04 (2H, *s*, OCH_2O), 4.32–4.21 (2H, *m*, H-9′), 3.87 and 3.85 (3H each, *s*, 2 OMe), 3.78 (1H, *m*, H-8′), 3.02 (1H, *dd*, $J = 14.8$ and 4.5 Hz, H-7′a), 2.62 (1H, *dd*, $J = 14.8$ and 10.3 Hz, H-7′b). ^{13}C NMR (50 MHz, $CDCl_3$): δ130.4 (C-1), 108.7 (C-2), 149.2 (C-3 and C-4 or C-3 and C-3′), 112.2 (C-5), 126.0 (C-6), 137.1 (C-7), 126.3 (C-8), 172.5 (C-9), 128.2 (C-1′, 108.5 (C-2′), 148.3 (C-3′ or C-4), 148.1 (C-4′), 111.5 (C-5′), 120.9 (C-6′), 37.6 (C-7′), 40.0 (C-8′), 69.7 (C-9′), 101.7 (OCH_2O), 55.8 (2 OMe). MS *m/z* (rel. int.): 368 $[M]^+$ (5), 337 (2), 233 (73), 135 (100).

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