

Phytochemical communication

Lignans from *Strophanthus gratus*

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Abstract

Three lignans, pinoresinol (**1**), 8-hydroxypinoresinol (**2**) and olivil (**3**) have been isolated from the leaves of *Strophanthus gratus* by reversed-phase HPLC. © 2001 Elsevier Science B.V. All rights reserved.

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Plant. *Strophanthus gratus* (W.J. Hook.) Franch. (Apocynaceae), stem-bark collected during October 1998 from Esen Epam Forest Reserve, Ghana. An authenticated voucher specimen (GC434669) for this collection has been retained at the herbarium of the Department of Botany, University of Ghana, Ghana.

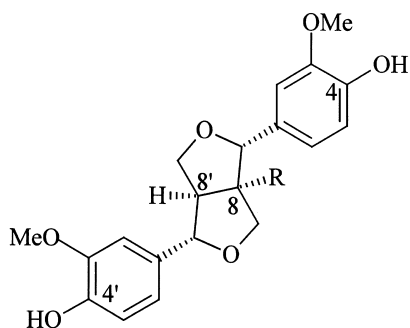
Uses in traditional medicine. Traditionally used to treat snake-bites in Africa [1] and also as arrow poison [2].

Previously isolated constituents. Cardenolides [2–4].

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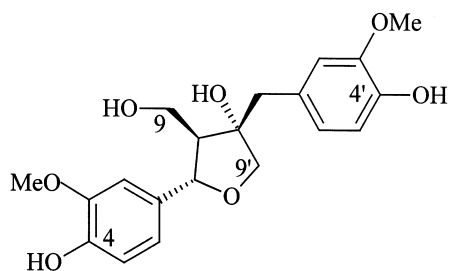
E-mail address: s.sarker@rgu.ac.uk (S.D. Sarker).

New-isolated constituents. Pinoresinol (1) [5] (22 mg), 8-hydroxypinoresinol (2), [6,7] (3.5 mg), olivil (3) [8] (4.6 mg) by reversed-phase HPLC of the CH_2Cl_2 extract of 1.1 kg of dried stem-bark.



1 R = H

2 R = OH



3

Pinoresinol (1). UV max (MeOH): 280, 230 nm; $^1\text{H-NMR}$ (500 MHz, CDCl_3): δ 6.92 (2H, *d*, *J* 1.6 Hz, H-2, H-2'), 6.91 (2H, *d*, *J* 8.4 Hz, H-5, H-5'), 6.84 (2H, *dd*, *J* 1.6, 8.4 Hz, H-6, H-6'), 4.76 (2H, *bd*, *J* 4.6 Hz, H-7, H-7'), 4.27 (2H, *dd*, *J* 9.0, 7.0 Hz, H-9a, H-9'a), 3.92 (6H, *s*, 3-OMe, 3'-OMe), 3.89 (2H, *dd*, *J* 9.0, 3.8 Hz, H-9b, H-9'b), 3.12 (2H, *m*, H-8, H-8'); $^{13}\text{C-NMR}$ (125 MHz, CDCl_3): 147.1 (C-3, C-3'), 145.7 (C-4, C-4'), 133.4 (C-1, C-1'), 119.4 (C-6, C-6'), 114.7 (C-5, C-5'), 109.1 (C-2, C-2'), 86.3 (C-7, C-7'), 72.1 (C-9, C-9'), 56.4 (3-OMe, 3'-OMe), 54.6 (C-8, C-8'); LC-MS *m/z*: 358 $[\text{M}]^+$ ($\text{C}_{20}\text{H}_{22}\text{O}_6$), 205, 191, 163, 151, 137, 124.

8-Hydroxypinoresinol (2). UV_{max} (MeOH): 278, 230 nm; $^1\text{H-NMR}$ (500 MHz, CDCl_3): δ 6.93 (1H, *s*, H-2'), 6.91 (1H, *d*, 1.5 Hz, H-2), 6.87 (1H, *d*, *J* 8.0, H-5), 6.82–6.79 (3H, overlapping peaks, H-6, H-6', H-5'), 4.78 (1H, *d*, *J* 5.0 Hz, H-7'), 4.77 (1H, *bs*,

H-7), 4.46 (1H, *dd*, *J* 8.6, 7.5 Hz, H-9'a), 3.98 (1H, *d*, *J* 9.0 Hz, H-9a), 3.87 (3H, *s*, 3-OMe), 3.84 (1H, masked under -OMe peaks, H-9b), 3.83 (3H, *s*, 3'-OMe), 3.77 (1H, *dd*, *J* 9.0, 6.0 Hz, H-9'b), 3.05 (1H, *m*, H-8'); ¹³C-NMR (125 MHz, CDCl₃): 147.4 (C-3), 147.1 (C-3'), 146.5 (C-4), 145.9 (C-4'), 133.6 (C-1'), 127.5 (C-1), 120.1 (C-6'), 120.0 (C-6), 115.1 (C-5), 114.7 (C-5'), 109.8 (C-2), 109.5 (C-2'), 92.1 (C-8), 88.2 (C-7), 86.2 (C-7'), 75.2 (C-9), 72.0 (C-9'), 60.6 (C-8'), 56.4 (3-OMe, 3'-OMe); LC-MS *m/z*: 374 [M]⁺ (C₂₀H₂₂O₇), 222, 207, 193, 178, 163, 151, 137, 103.

Olivil (3). UV max (MeOH): 278, 229 nm; ¹H-NMR (500 MHz, CDCl₃): δ 6.94 (1H, *bs*, H-2), 6.81–6.77 (3H, *m*, H-5, H-6, H-5'), 6.74 (1H, *d*, *J* 2.0, H-2'), 6.70 (1H, *dd*, *J* 8.0, 2.0, H-6'), 4.64 (1H, *d*, *J* 8.0 Hz, H-7), 3.90 (1H, *dd*, *J* 10.5, 7.5 Hz, H-9a), 3.86 (1H, *bd*, *J* 9.0, H-9'a), 3.83 (3H, *s*, 3'-OMe), 3.82 (3H, *s*, 3-OMe), 3.79 (1H, *m*, H-9b), 3.60 (1H, *bd*, *J* 9.0, H-9'b), 2.99 (1H, *d*, *J* 13.5, H-7'a), 2.88 (1H, *d*, *J* 13.5, H-7'b), 2.43 (1H, *m*, H-8); ¹³C-NMR (125 MHz, CDCl₃): 147.0 (C-4), 146.9 (C-4'), 145.9 (C-3), 145.1 (C-3'), 134.2 (C-1'), 128.6 (C-1), 123.3 (C-6'), 119.8 (C-6), 114.8 (C-5'), 114.5 (C-5), 113.2 (C-2'), 109.1 (C-2), 83.5 (C-7), 81.7 (C-8'), 77.6 (C-9'), 61.0 (C-9), 59.5 (C-8), 56.4 (3-OMe), 56.3 (3'-OMe), 39.6 (C-7'); LC-MS *m/z*: 376 [M]⁺ (C₂₀H₂₄O₇), 153, 137, 123.

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