

A Morphinane Alkaloid, Sinococuline, from *Stereospermum suaveolens* DC.

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A morphinane alkaloid, sinococuline was isolated from the root of *Stereospermum suaveolens* DC (Bignoniaceae) and showed cytotoxic activity. The structure was elucidated on the basis of spectroscopic data. This is the first report of its isolation from this plant.

Keywords Sinococuline; *Stereospermum suaveolens* DC; Bignoniaceae; morphinane alkaloid

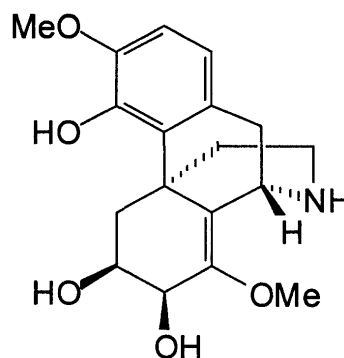
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Stereospermum suaveolens DC, a member of the Bignoniaceae family, is distributed throughout India (Indian name Padal, Patala). The root of this plant has been used in India traditional medicine for anti-fever purposes. From this plant, lapachol, flavone glycosides, β -sitosterol, anthraquinone and naphthoquinone¹⁾⁻⁵⁾ have previously been reported.

In this paper, we report the bioassay-guided isolation of sinococuline, a rare morphinane alkaloid, from the root of *S. suaveolens* DC.

The roots of *S. suaveolens* were purchased from Associated Dicheem Corporation (India). Dried roots of *S. suaveolens* (1080 g) were extracted with MeOH at room temperature for 1 week. The MeOH solution was filtered and the filtrate was concentrated *in vacuo* to yield the MeOH extract (23 g). The MeOH extract (10.2 g) was adsorbed on silica gel and applied to column chromatography over silica gel and eluted with hexane-EtOAc (4 : 1, v/v), EtOAc and MeOH to afford three fractions, fraction 1 (519 mg), fraction 2 (500 mg) and fraction 3 (8134 mg) and the cytotoxic activity was detected in fraction 3. A portion of fraction 3 (400 mg) was subjected to gel filtration on a Sephadex LH-20 column (11 mm id x 950 mm). Elution with MeOH gave fraction 3-1 (30 mg), 3-2 (186 mg) and 3-3 (189 mg) (Kd value=0 to 0.75, 0.75 to 1.0 and 1.0 to 2.0, respectively). The active fraction, 3-2, was further purified by silica gel column chromatography using CHCl_3 -MeOH (9 : 1, v/v) as an eluent, followed by Sephadex LH-20 (MeOH) to yield compound **1** (74 mg).

Compound **1** was obtained as a white powder. The molecular formula was determined to be $\text{C}_{18}\text{H}_{23}\text{NO}_5$ by high-resolution electro-spray-ionization mass spectra (HR-ESI-MS). When the NMR data for **1** were compared with those of a known morphinane alkaloid, sinococuline, isolated from *Cocculus trilobus*,⁶⁾ a similar chemical shift pattern was observed. Detailed comparison of its spectroscopic data ($[\alpha]_D$, MS, ^1H - and ^{13}C -NMR) with those reported in the literature^{6), 7)} identified the structure of the compound **1** as sinococuline.



Sinococuline (**1**)

Sinococuline showed cytotoxic activity against the human lung cancer cell line A549 ($\text{IC}_{50} = 1.83\mu\text{M}$) and colorectal cancer cell line HT-29 ($\text{IC}_{50} = 2.08\mu\text{M}$).

Phytochemical studies on the genus *Stereospermum* have found lignans, anthraquinones and naphthoquinones.⁸⁾⁻¹³⁾ No morphinane alkaloids from

Stereospermum genus have been investigated. Sinococuline is a rare morphinan alkaloid previously reported from only Menispermaceae family sources, *C. trilobus*,⁶⁾ *Stephania cepharantha*,⁷⁾ *S. excentrica*,¹⁴⁾ *S. sutchuenensis* H.S.Lo¹⁵⁾ and *Strychnopsis thouarsii* Baillon.¹⁶⁾ This is the first report on the isolation of sinococuline from plants of the Bignoniaceae family.

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