

Alkaloids from *Trachelospermum jasminoides*

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Received: October 16, 1987

From the leaves and stems of *Trachelospermum jasminoides* Lem (Apocynaceae) (1), four indole alkaloids, namely ibogaine, tabernaemontanine, vobasine, and voacangine-7-hydroxyindolenine, have been isolated. The ¹³C-NMR spectrum of voacangine-7-hydroxyindolenine is also reported.

Leaves and stems (50 kg) were dried in the shade and extracted with ethanol. The crude alcoholic extracts were concentrated and partitioned between 10% HCl and CHCl₃ (pH 1). The chloroform layer was dried with anhydrous sodium sulphate and concentrated to a gum (25 g, F₁). The aqueous acidic layer was basified with aqueous ammonia and extracted into chloroform at various pH values (5, 7, 9, and 11). The fraction obtained at pH-5 (20 g, F₂) was found to contain major alkaloids. We have recently reported five indole alkaloids from this plant (2).

The crude alkaloidal fraction (F₁, 25 g) was subjected to flash chromatography. The column was eluted with increasing polarities of mixture of petroleum ether, chloroform, ethyl acetate, and methanol. The fraction obtained on elution with 70% petroleum ether/30% chloroform was concentrated and further purified by preparative TLC on silica gel (petroleum ether:chloroform:ammonia, 9:0.9:0.1). The alkaloid isolated was identified as voacangine-7-hydroxyindolenine by comparison of its spectral data with those reported in literature (3). The ¹³C-NMR assignments for the various carbons of the 7-hydroxyindolenine are presented in Table I. These assignments were made by analogy with established data for closely related indolenine alkaloids (4-6). Voacangine-7-hydroxyindolenine may have been formed by air oxidation during the extraction and isolation process.

Table I. ¹³C-NMR of voacangine-7-hydroxyindolenine (CDCl₃).

Carbon No.	Chemical shift	Multiplicity
C-2	186.91	-C-
C-3	49.21*	-CH ₂
C-5	48.70*	-CH ₂
C-6	29.60	-CH ₂
C-7	88.45	-C-
C-8	122.18	-C-
C-9	113.82*	-CH
C-10	160.98	-C-
C-11	121.45*	-CH
C-12	108.11*	-CH
C-13	144.93	-C-
C-14	27.16	-CH
C-15	32.14	-CH ₂
C-16	57.31	-C-
C-17	34.57	-CH ₂
C-18	11.58	-CH ₃
C-19	26.57	-CH ₂
C-20	37.66	-CH
C-21	55.80	-CH
ArOCH ₃	58.61	-CH ₃
COOCH ₃	53.19	-CH ₃
COOCH ₃	+	

* Weak.

* Assignments may be interchangeable.

Fraction F₂ (20 g) was also loaded on a silica column (750 g) and was eluted with increasing polarities of mixtures of petroleum ether, chloroform, ethyl acetate, and methanol.

The fraction obtained on elution with chloroform:ethyl acetate (3:1) consisted of a mixture of four alkaloids. This fraction was subjected to a flash chromatography which was eluted with increasing polarities of mixtures of petroleum ether in acetone. The fraction obtained on elution with 70% petroleum ether in acetone was found to contain two major alkaloids. These alkaloids were separated by preparative TLC on silica gel (petroleum ether:acetone:ammonia, 6:3.95:0.05). The faster moving alkaloid was identified as ibogaine by comparison of its spectral data with those reported in literature (7) while the slower moving alkaloid was identified as tabernaemontanine (8).

Further elution of the same column with 60% petroleum ether in acetone afforded another alkaloid which was further purified by preparative TLC on silica gel (petroleum ether:acetone:ammonia, 1:1:0.02). This alkaloid exhibited spectral data identical to those of vobasine (9).

References

- (1) Perry, Z. M. (1895) *Medicinal Plants of East and South East Asia*, 31, MIT Press, Cambridge.
- (2) Rahman, A. U., Fatima, T., Nisa, M., Wasti, S., Crank, G. (1987) *Planta Med.* 53, 57.
- (3) Agwada, V. C., Morita, Y., Renner, U., Hesse, M., Schmid, H. (1975) *Helv. Chim. Acta* 58, 1001.
- (4) Wenkert, E., Cochran, D. W., Gottlieb, H. E., Hagaman, E. W., Filho, R. B., Matos, F. J. de A., Madruga, M. I. L. M. (1976) *Helv. Chim. Acta* 59, 2437.
- (5) Broadbent, T. A., Paul, E. G. (1983) *Heterocycles* 20 (5), 909.
- (6) Garnier, J., Mahuteau, J., Moretti, C. (1984) *J. Nat. Prod.* 191.
- (7) Biemann, K., Friedmann-Spiteller, M. (1961) *J. Am. Chem. Soc.* 83, 4805.
- (8) Husson, A., Lauglois, Y., Riche, C., Husson, H. P., and Potier, P. (1973) *Tetrahedron* 29, 3095.
- (9) Renner, U., Prins, D. A., Burlingame, A. L., Biemann, K. (1963) *Helv. Chim. Acta* 46, 2186.

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