

Sotetsuflavone (IIc) has been reported as the sole bisflavone of *Cycas revoluta* Thunb.⁵ However, reinvestigation of this plant revealed that the reported sotetsuflavone is a mixture, major part of which is amentoflavone and minor components are methyl ethers of amentoflavone. Details will be reported later.

Bilobetin (IIa), ginkgetin (IIIa), isoginkgetin (IIIb) and sciadopitysin (IV) have previously been isolated^{1,6} from the leaves of *Ginkgo biloba* L. Thus, this cycad and the ginkgo resemble one another not only in many details of their reproductive structures but also in their ability to synthesize bilobetin, ginkgetin and sciadopitysin.

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⁵ N. KAWANO and M. YAMADA, *J. Pharm. Soc. Japan* **80**, 1576 (1960).

⁶ H. MIURA, T. KIHARA and N. KAWANO, *Chem. Pharm. Bull. Tokyo* **17**, 150 (1969).

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ANGIOSPERMAE (DICOTYLEDONAE)

APOCYNACEAE

MACRALSTONINE FROM *ALSTONIA MUELLERIANA**

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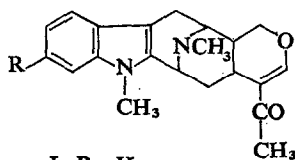
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Abstract—Macralstonine has been isolated from the alkaloidal fraction of *Alstonia muelleriana*. This supports the close phytochemical relationship between this species and *A. macrophylla* inferred in other recent work.

INTRODUCTION

THE RECENT establishment¹ of structure (I) for alstonerine, a constituent of the alkaloidal fraction of *A. muelleriana*,² has emphasized the close relationship between *A. muelleriana*



I; R=H

III; R=OCH₃

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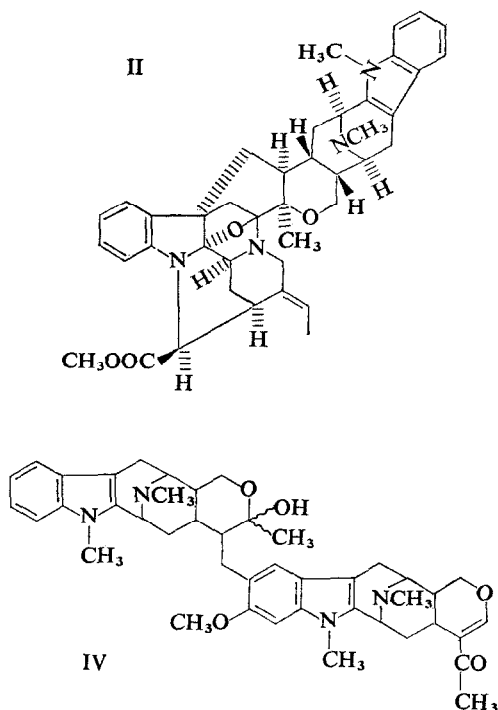
¹ J. M. COOK, P. W. LE QUESNE and R. C. ELDERFIELD, *Chem. Commun.* 1306 (1969).

² (a) R. C. ELDERFIELD, *Am. Scientist* **48**, 193 (1960); (b) R. C. ELDERFIELD and R. E. GILMAN, *Phytochem.* in press.

and *A. macrophylla*.³ Alstonerine (I) represents the 'macroline' element of the dimeric alkaloid villalstonine (II),^{4,5} common to both species. The methoxyalstonerine alkaloid alstophylline (III) is found in *A. macrophylla*.⁶

RESULTS

We now report the isolation of the dimeric alkaloid macralstonine (IV)⁷ from *A. muelleriana*. This compound occurs in *A. macrophylla* also, and is clearly related to alstonerine (I). Further work on *A. muelleriana* alkaloids is in progress in our laboratory.



EXPERIMENTAL

Isolation of Macralstonine

Alkaloidal fractions containing alstonisidine and alstonisine^{2b} were subjected to fractional crystallization from methanol. A fraction less soluble in methanol was shown by TLC (Eastman Chromagram fluores-

³ J. E. SAXTON, in *The Alkaloids*, (edited by R. H. F. MANSKE) Vol. VIII, p. 159, Vol. XII, p. 207 Academic Press, New York (1965), (1970).

⁴ C. NORDMAN and S. K. KUMRA, *J. Am. Chem. Soc.* **87**, 2059 (1965).

⁵ M. HESSE, H. HÜRZELER, C. W. GEMENDEN, B. S. JOSHI, W. I. TAYLOR and H. SCHMID, *Helv. Chim. Acta* **48**, 689 (1965); M. HESSE, F. BODMER, C. W. GEMENDEN, B. S. JOSHI, W. I. TAYLOR and H. SCHMID, *Helv. Chim. Acta* **49**, 1173 (1966).

⁶ T. KISHI, M. HESSE, C. W. GEMENDEN, W. I. TAYLOR and H. SCHMID, *Helv. Chim. Acta* **48**, 1349 (1965).

⁷ T. KISHI, M. HESSE, W. VETTER, C. W. GEMENDEN, W. I. TAYLOR and H. SCHMID, *Helv. Chim. Acta* **49**, 946 (1966).

cent silica gel sheets; acetone as developing solvent) to contain a further alkaloid having R_f 0.57 (R_f alstonisine 0.49; R_f alstonisine 0.66). The new component was purified by preparative TLC (E. Merck silica gel plates) and crystallization from methanol to give macralstonine (IV),⁷ m.p. 276–278°, of identical u.v., i.r., NMR, and mass spectra, and optical rotation to those of authentic material.

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ALKALOIDS OF *HAZUNTA MODESTA*

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Plant. Hazunta modesta (Bak.). Pichon (Syn. *Tabernaemontana modesta* Bak.).

Source. Madagascar.

Previous work. From branches and stem bark of sister species *H. velutina* were isolated vobasine, tabernaemontanine, dregamine, voacarpine, hazuntine and hazuntinine.¹

Examined part. Roots, extracted with EtOH until exhaustion. The alkaloids were dissolved from dry extract in 5% citric acid, the bases set free with aqueous ammonia, extr. with CHCl_3 and chromatographed on a neutral Al_2O_3 column. Ibogamine, tabernaemontanine (eluted with C_6H_6) and dregamine [eluted with C_6H_6 -ether (7:3)] were identified. Total alkaloids constituted 2.5 per cent of weight of the dry roots.

Ibogamine. $\text{C}_{19}\text{H}_{24}\text{N}_2$ —Found: m.p. 155–7° (MeOH); $[\alpha]_D - 36^\circ$ ($C = 1$, CHCl_3). Required; m.p. 162–3°;² $[\alpha]_D - 36.4^\circ$ (CHCl_3);² i.r.,³ u.v.⁴ and m.s.⁵ were in full accordance with those reported for authentic ibogamine. NMR spectrum (in CDCl_3) provided further confirmation of proposed identification. It showed peaks between τ 2.5 and 3 (5 indole

* M.ps are uncorrected.

¹ P. POTIER, A. M. BUI, B. C. DAS, J. LE MEN and P. BOITEAU, *Ann. Pharm. Franç.* **26**, 621 (1968).

² D. F. DICKEL, C. L. HOLDEN, R. C. MAXFIELD, L. E. PASZEK and W. I. TAYLOR, *J. Am. Chem. Soc.* **80**, 123 (1958).

³ M. GOUTAREL, M. M. JANOT, F. METHYS and V. PRELOG, *Helv. Chim. Acta* **39**, 742 (1956).

⁴ N. NEUSS, Ed. Lilly Collection of Physical Data of Indole and Dihydroindole Alkaloids, Lilly Res. Lab., Indianapolis, Ind. Dec. (1963).

⁵ K. BIEMANN and M. FRIEDMANN-SPITELLER, *J. Am. Chem. Soc.* **83**, 4805 (1961).