Phytochemistry, Vol 22, No 1, pp 321–322, 1983
Printed in Great Britain

0031-9422/83/010321-02$03 00/0

DEHYDRODISCRETINE, AN INFREQUENTLY OCCURRING QUATERNARY PROTOBERBERINE ALKALOID FROM *HEPTACYCLUM ZENKERI**

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(*Received* 7 *April* 1982)

Key Word Index—*Heptacyclum zenkeri*, *Penianthus zenkeri*, Menispermaceae, quaternary protoberberine alkaloid, dehydrodiscretine

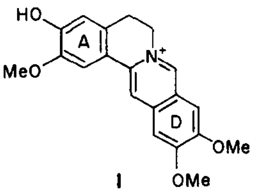
Abstract—Dehydrodiscretine, a quaternary protoberberine alkaloid, has been isolated from *Heptacyclum zenkeri* Engl (syn *Penianthus zenkeri* Diels) This is the first reported isolation of this alkaloid from a member of the Menispermaceae and only the second reported isolation from nature

INTRODUCTION

Heptacyclum zenkeri Engl [1] Menispermaceae (syn *Penianthus zenkeri* Diels [2]) is a woody climber or small shrub indigenous to West Africa, where the roots and twigs have been used as an aphrodisiac and in the treatment of local infections and venereal disease [3] We have recently reported the occurrence of the quaternary protoberberine alkaloids palmatine and jatrorrhizine and the quaternary aporphine alkaloid magnoflorine from an extract of the stems and roots [4] This brief note is to report the isolation of dehydrodiscretine iodide (**1**), an infrequently occurring quaternary protoberberine alkaloid, from the same extract

RESULTS AND DISCUSSION

Careful re-examination of fractions 50–66 from CC of fraction C [4] revealed the presence of an additional yellow-orange colored alkaloid on TLC over Si gel G [4] Fractions 56–66 were combined to afford a brownish-orange residue (37 mg) which was dissolved in methanol (10 ml) and passed over a column of anion exchange resin (10 ml) [IRA-410 (I)] The column eluate plus its methanol rise (20 ml) was evaporated to dryness and the resulting dark orange residue crystallized from methanol to afford orange needles (16 mg) of a quaternary alkaloid iodide, mp 243–245° (dec), R_f 0 38 [$CHCl_3$–MeOH–NH_4OH (14 7 1)], R_f 0 49 [MeOH-NH_4OH- H_2O (8 1 1)], R_f 0 47 [*n*-PrOH–MeOH–NH_4OH–H_2O (4 2 2 1)], UVλ_{max}^{MeOH} nm (log ε) 242 (4 24), 265 (4 13), 289 (4 32), 315 (sh) (4 15), 342 (3 97) and 381 (3 97) with no shift in 0 1 N methanolic hydrochloric acid, UV$\lambda_{max}^{MeOH+OH^-}$ nm (log ε), 254 (4 46), 309 (4 24) and 379 (4 31), IRν_{max}^{KBr} cm^{-1} 3440, 1615, 1575, 1518, 1500, 1430, 1357, 1290, 1260, 1220, 1175, 1129, 1032, 1009, 910 and 880, ^{1}H NMR [60 MHz, $CDCl_3 + CD_3OD$ (1 1)] δ 4 03 (3H, *s*, OMe), 4 07 (3H, *s*, OMe), 4 15 (3H, *s*, OMe), 6 86–9 40 (6H, *m*, ArH) Treatment of this alkaloid (7 mg) with $NaBH_4$ (10 mg) in MeOH (10 ml) and work-up in the usual fashion [5] afforded a colorless amorphous residue (4 mg), UVλ_{max}^{MeOH} nm (log ε) 224 (sh) (3 86) and 286 (3 41), MS *m/z* (rel int), 341 $[M]^+$ (4%), 326(7), 257(9), 193(8), 185(13), 176(13), 165(39), 164(100), 150(10), 149(50), 124(17), 121(21), 97(26), 83(41), 71(44), 69(59), 59(46), 57(80), 55(84), 43(95) and 41(98) A consideration of the UV [6, 7] and ^{1}H NMR [5, 8] spectra of the quaternary alkaloid and the UV [6, 7] and mass [9] spectra of the reduced product suggested that the quaternary alkaloid was a 2, 3, 10, 11-tetraoxygenated protoberberine with one methoxy and one hydroxy group in ring A and two methoxy groups in ring D, while the reduced product was its tetrahydro-derivative The alkaloid was identified as dehydrodiscretine iodide (**1**) by direct comparison (UV, IR, mp, co-TLC) with an authentic reference sample



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Dehydrodiscretine was first isolated from *Thalictrum fauriei* Hayata (Ranunculaceae) in 1980 [5], and to our knowledge this is the first reported isolation of this alkaloid from a Menispermaceous species, and only the

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*Part 31 in the series "Constituents of West African Medicinal Plants" For Part 30, see Spiff, A I, Zabel, V, Watson, W H, Zemaitis, M A, Ateya, A M, Slatkin, D J, Knapp, J E and Schiff, P L, Jr (1981) *J Nat Prod* **44**, 160 second reported isolation from nature Furthermore, discretine, the parent tetrahydroprotoberberine analog of dehydrodiscretine, appears to have been isolated only from *Xylopia discreta* (Anonaceae) [10] to date

Finally, dehydrodiscretine was found to be devoid of antimicrobial activity when tested against a standard collection of Gram-positive, Gram-negative, acid-fast micro- and fungal organisms [11]

Acknowledgements—We are grateful to Dr C-H Chen, School of Pharmacy, National Taiwan University, Taipei, Taiwan, Republic of China for providing an authentic sample of dehydrodiscretine and to Mr Joseph Bender, School of Pharmacy, University of Pittsburgh for determining the mass spectra

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