

WISANINE, A NOVEL ALKALOID FROM THE ROOTS OF PIPER GUINEENSE

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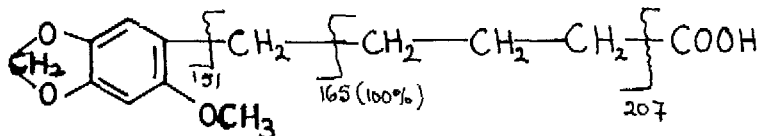
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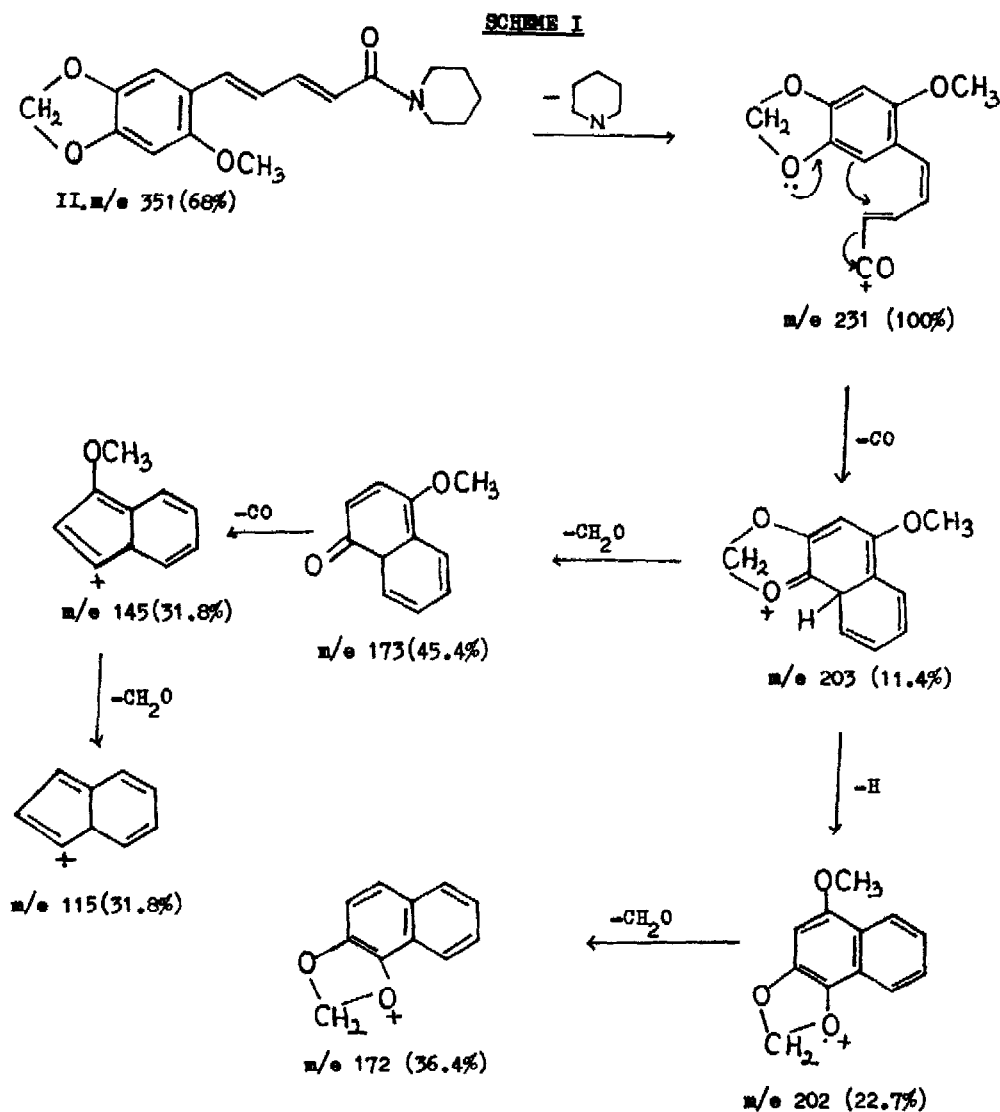
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As part of our investigation of the medicinal plant *Piper guineense* (West African black or Ashanti Pepper^(1, 2)), we have isolated as the major constituent (0.12%) of the roots, a novel piperine-type alkaloid, wisanine, from the petroleum ether extract⁽³⁾, as large yellow prisms (EtOAc), mp 179-181°. Labat's test for OCH₂O group was positive. U.V. λ_{max} (EtOH) 250, 304, 309, 378nm (log ε 4.00, 4.16, 4.12, 4.32) indicated a piperine-type chromophore^(4, 5) IR(KBr) ν_{max} 1640 (tert amide C=O), 1600, 1620 cm⁻¹ (trans-conjugated -CH=CH-). Exact mass determination (M⁺, m/e 315.1476, calcd 315.1470) and elemental analysis gave C₁₈H₂₁O₄N. The nmr (CDCl₃) spectrum, similar to that of piperine⁽⁶⁾, showed peaks at τ 8.45 (s, 6H, -(CH₂)₅- of piperidine ring), 6.54 (s, broad, 4H, CH₂NCH₂ of piperidine ring), 4.16 (s, 2H, OCH₂O) 2.3-4.0 (m, 6H, 2 arom. and 4 alkenic protons), 6.29 (s, 3H, Ar OCH₃). The position of the OCH₃ group, which on biosynthetic grounds could be in either the 2, 5 or 6 positions of the benzene ring, was determined by hydrolysing the compound to the acid, mp 221-224° (M⁺, m/e 248), which was then hydrogenated to the tetrahydro derivative, mp 105-106°, C₁₃H₁₆O₅, M⁺, m/e 252. The nmr spectrum of this compound showed, among other significant peaks, two sharp singlets in the aromatic region, indicating two para protons. This suggested the acid to have the structure (I), and wisanine as N-piperidyl-5-(2-methoxy-4, 5-methylenedioxyphenyl)-trans-2-trans-4-pentadienamide(II). This structure was supported by the mass spectral fragmentation pattern based on that postulated for similar systems by Loder *et al.*⁽²⁾ and by Chatterjee and Dutta.⁽⁵⁾ (SCHEME I)



I. m/e 252 (68%).

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**Notes and References:**

- (1) F.R. Irvine, *Woody Plants of Ghana*, Oxford University Press. (1961) p.40. The medicinal uses of this plant, which include its use for treating syphilis and gonorrhoea, and to assist conception, is reported.
- (2) J.W. Loder, Ann Moorehouse, and G.B. Russel, *Austr. J. Chem.* 1539 (1969). Loder reports that *Piper* species have tumour inhibitory properties.
- (3) Details of isolation and purification will be published as part of a full paper dealing with wisanine and other constituents of the roots.
- (4) J. Singh, K.L. Dhar and C.K. Atal, *Tet.Lett.* 56 (1969) 4975
- (5) A. Chatterjee and C.P. Dutta, *Tetrahedron*, 23, (1971) 1769
- (6) Varian High Resolution Nmr Catalogue, Vol.I spectrum No.328
- (7) All compounds reported in this communication gave satisfactory elemental analyses. All other spectroscopic data were also consistent with the structures indicated.