Tetrahedron Letters No. 7, pp 609 - 610, 1974. Pergamon Press. Printed in Great Britain.

COUROUPITINE A, A NEW ALKALOID FROM COUROUPITA GUIANENSIS

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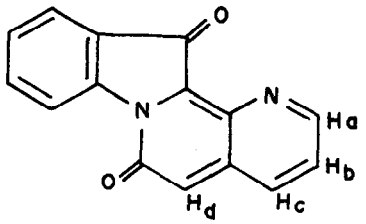
(Received in UK 20 December 1974; accepted for publication 11 January 1974)

Couroupita guianensis Aubl. is commonly known as cannon ball tree as its fruit resembles a cannon ball. Some chemical works have already been done on the fruits[1], flowers[2] and the stem bark[3], but no alkaloidal constituent has yet been isolated from any part of the plant. During the course of our investigation on matured fruits we have been able to isolate two alkaloids; the present communication deals with the structure elucidation of one of them designated as Couroupitine A. Various spectrometric data together with biogenetic consideration led us to suggest structure (I) for this compound.

Petroleum extract of dried and powdered fruits on repeated chromatographic purification followed by crystallisation from MeOH-$CHCl_3$ mixture yielded couroupitine A as yellow needles, m.p. 265-66°, $[\alpha]_D \pm 0°$ ($CHCl_3$) and gave a molecular ion peak at m/e 248, confirming the molecular formula $C_{15}H_8O_2N_2$ assigned on the basis of elementary analysis. The UV spectrum exhibited λ_{max}^{EtOH} 225, 251 and 315 nm (inflection) (log ε 4.46, 4.68 and 4.04 respectively) characteristic of a pseudo indoxyl skeleton[4]. The IR spectrum (nujol) showed bands at 1725 (5-ring ketone in conjugation with aromatic ring), 1680, 1310 (amide I and amide III bands), 1519, 1550, 760 (phenyl) and 1350 cm^{-1} (C-N stretching). The NMR spectrum (100 MHz, $CDCl_3$, TMS) did not show the presence of any saturated aliphatic proton, instead it indicated the aromatic character of all the 8 protons. The doublet centred at δ 8.61 was assigned to H_a present in proximity with the N atom in the pyridine ring. The H_b and H_c appeared as a sextet centred at δ 7.51. Thus as it would be expected the three protons

gave rise to an ABX system[5]. The H_d appeared as a singlet at δ 7.27 virtually merged with the $CDCl_3$ signal. The four protons in the benzene ring appeared as a multiplet from δ 7.60 to δ 8.5. Consequently, the splitting pattern of the signals in the NMR spectrum appears to be in conformity with the structure (I) assigned for couroupitine A. The mass spectrum was also compatible with this structure. Besides the molecular ion peak at m/e 248 (base peak) the other significant peaks discernible were at m/e 220 (M^+-CO), 192 (M^+-2XCO) and 165 (M^+-2XCO-HCN).



(I)

From the above extract, a sterol mixture was also isolated which on repeated chromatography over $AgNO_3$ impregnated silica gel could be separated into stigmasterol (m.p., m.m.p., TLC and IR) and camphesterol (m.p., m.m.p., TLC and IR).

From the $CHCl_3$ extract a red coloured alkaloid designated as couroupitine B, m.p.> 340°, $[\alpha]_D \pm 0°$ ($CHCl_3$) has also been isolated. It produced an N-acetyl derivative, m.p. 186° and molecular weight 304 (M^+). The complete structure of the compound is under investigation.

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