

ALKALOIDS OF *CANNABIS SATIVA* LEAVES

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Key Word Index—*Cannabis sativa*; Cannabinaceae; marihuana leaves; alkaloids; 4-(β -dimethylaminoethyl)-phenol; hordenine

Plant. *Cannabis sativa* L. Cannabinaceae (leaves) **Source.** Research Institute of Pharmaceutical Sciences, University of Mississippi, Lot CQUF-72, QU-A(1)/C-70, S-62, grown in 1972.

Previous work. On leaves: choline and trigonelline [1], muscarine [2], an unidentified betain [3], and cannabamines A-D, all as yet of unknown structure [4].

Present work. Dried ground leaves were extracted by percolation with 95% EtOH at room temp. After removal of solvent *in vacuo* at 40°, the residue (14%) was partitioned between 2% citric acid and CHCl_3 . The aqueous phase was rendered alkaline with conc. NH_3 and extracted with CHCl_3 . The alkaloidal fraction thus obtained was further purified by dissolving in 1N HCl and extraction with CHCl_3 , then alkalized with conc. NH_3 and reextracted with CHCl_3 . This latter fraction was chromatographed on Si gel G.

Elution with MeOH–conc NH_3 (99:1) gave at first a dark brown material that gave a weak test for alkaloids. This was followed by a light yellow fraction which crystallized spontaneously when the solvent was evaporated and was recrystallized from Me_2CO –hexane to give feathery needles mp

118–119°; IR, $\nu_{\text{max}}^{\text{CHCl}_3}$ 3600, 3040, 2960, 2870, 2838, 2795, 1620, 1603, 1520, 1475, 1380, 1255, 1175, 1145, 1103, 1055, 1040, 1009, 870, 845 and 830 cm^{-1} ; UV, $-\lambda_{\text{max}}^{\text{MeOH}}$ 274 nm ($\epsilon = 1261$) and 211 nm ($\epsilon = 11000$) MS showed M^+ at 165 (14%) with the base peak at 58 ($\text{CH}_2 = \text{N}^+\text{Me}_2$). The NMR spectrum taken in CDCl_3 showed an exchangeable one-proton singlet at δ 8.08, an A_2B_2 pair of doublets integrating for 4 protons centered at δ 6.94 and 6.59 (J 9Hz), a distorted 4-proton triplet at δ 2.69 and a 6-proton singlet at δ 2.36. Direct comparison (mp & mmp, IR NMR) with an authentic sample of hordenine confirmed the identity of the isolated material.

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L-3-CARBOXY-1,2,3,4-TETRAHYDRO- β -CARBOLINE, A NEW AMINO ACID FROM SEEDS OF *ALEURITES FORDII*

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Key Word Index—*Aleurites fordii*; Euphorbiaceae; non-protein amino acid; L-3-carboxy-1,2,3,4-tetrahydro- β -carboline; other amino acids.

Plant. *Aleurites fordii* Hemsl. **Source.** Okayama University campus and Handayama Botanical Garden. **Uses.** Tung oil has been used in paints,

varnishes, etc. **Previous work.** Isolation of the toxic principle of fruits [1], fractionation of basic and acidic constituents of tung oil [2]. **Present**