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NEWER ALKALOIDS FROM ALANGIUM LAMARCKII THW.[1]

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The isolation of cephaeline, emetine, psychotrine(2), tubulosine(3-5), desmethyltubulosine (6,7) and iso-tubulosine (8) have already been reported from the root-bark of Alangium lamarckii Thw. (Alangiaceae). We now report two more new phenolic alkaloids designated as desmethylpsychotrine, m.p. 166-168°, $[\alpha]_D$ + 67.9° (c 0.50 MeOH) and alangicine, m.p. 147-148°, $[\alpha]_D$ + 64.1° (c 0.26 MeOH) from the same source.

The psychotrine fraction even after repeated crystallisations from acetone-water in stout bright yellow needles showed three distinct spots in TLC over silica gel G run in 15% methanol in chloroform solvent system. The mixture could however be resolved into the pure components through chromatography over silica gel using 1-5% methanol in chloroform. Psychotrine, m.p. 121-122°, $[\alpha]_D$ + 75.5° (c 0.6 MeOH) characterised as the dihydrogenoxalate of its O-methyl derivative, m.p. 161° (dec.), $[\alpha]_D$ + 42° (c 1.0, water) was the first to be eluted followed by alangicine and desmethylpsychotrine in that order. The infra-red spectrum of each of the new alkaloids in chloroform exhibits a sharp band near 3509 cm^{-1} indicating the presence of phenolic OH group.

Alangicine, $C_{28}H_{36}N_2O_5$ (mol. wt. 480 by mass spectrum), crystallises from alcohol in light yellow granules. It analysed for three OCH_3 groups. It exhibits UV absorption maxima at 275 (log ϵ 3.84), 312 (log ϵ 3.42) and 408 (log ϵ 4.09) m μ in ethanol and at 238 (log ϵ 4.17), 292 (log ϵ 3.82) and 328 (log ϵ 4.07) m μ in 0.1 N NaOH compatible with

a catechol system. On treatment with diazomethane, it afforded two distinct methylated products detectable by TLC. The presence of at least two phenolic hydroxyl groups in the molecule was thus inferred.

The structure of alangicine became virtually clear from mass spectrometry. Besides M-CH_3, M-C_2H_5 and M^{++}, the other important ion peaks appeared at m/e 302, 290, 289 (intense), 288 (intense), 274, 260 (most intense), 258, 216, 207, 206, 192, 191, 190 and 178. A comparison with the spectrum of psychotrine(9) shows that the fragments corresponding to the benzoquinolizidine moiety are shifted to higher values by 16 mass units. On the other hand, the peak positions corresponding to the isoquinoline residue (rings D and E) remained unaltered. The relative intensity patterns of the peaks are also similar. Undoubtedly, the phenolic hydroxyl groups must be located one each in rings A and E. Assuming the correct site of phenolic group of alangimarckine and ankorine(10) at position 8 of the benzoquinolizidine moiety and from biogenetic considerations, alangicine may be assigned the tentative structure I. The absolute configuration remain yet to be settled.

Desmethylpsychotrine analysed for $C_{27}H_{34}N_2O_4$ (mol. wt. 450 by mass spectrum) and two OCH_3 groups. It crystallised from ethanol in dark yellow granules. It shows UV maxima at 223, 277, 310 and 410 mμ (log ϵ 3.95, 3.83, 3.34 and 3.96 respectively) while in 0.1N NaOH the values are 243, 307 and 326 mμ (log ϵ 4.41, 4.28, 4.32 respectively).

On treatment with excess of diazomethane for 20 hr., the compound led exclusively to O-methylpsychotrine. On the other hand, demethylation* of psychotrine with conc. hydrochloric acid under reflux for 6 hr. gave in

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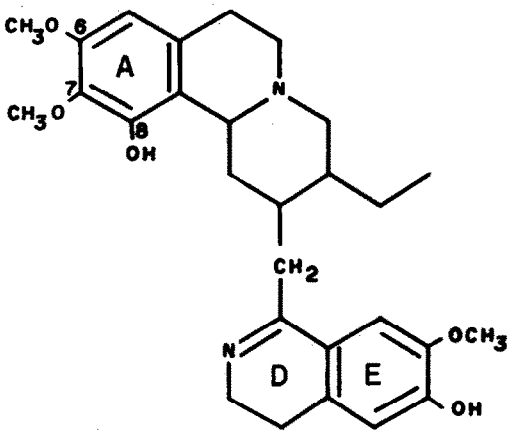
* O-methylpsychotrine when hydrolysed under severe conditions has been reported(11) to yield eight products.

addition to the unconverted material another spot in TLC identical with that of desmethylpsychotrine indicating the nature of the compound. While one of the hydroxyl groups must be at position 6' as in psychotrine, the other could occupy either of the three possible positions at 6,7 or 7'.



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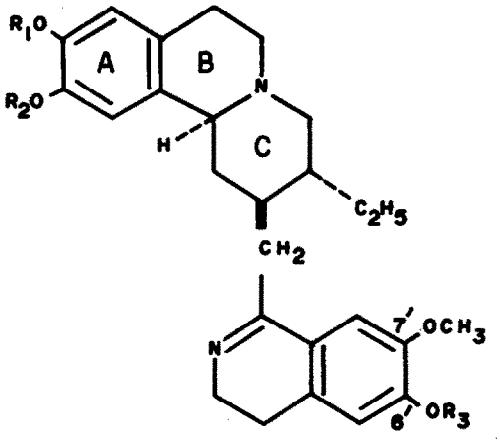

II, R_1=H; R_2=CH_3; R_3=H

III, R_1=CH_3; R_2=H; R_3=H

IV, R_1=H; R_2=R_3=CH_3

V, R_1=R_3=CH_3; R_2=H

The mass spectrum of the compound shows ion peaks at m/e 435 (M-CH_3), 421 (M-C_2H_5), 272, 260, 259 (intense), 258 (intense), 256, 244, 230 (most intense), 228, 225 (M^{++}), 216, 192, 191, 190, 178, 177 and 176. The fragmentation pattern is exactly parallel to that of psychotrine(9), with the difference that the ion peaks corresponding to the A/B/C ring system are shifted to lower values by 14 mass units. This establishes the position of the second hydroxyl group at ring A. Hence, desmethylpsychotrine must be either II or III though a differentiation is not possible at this stage.

Finally, desmethylpsychotrine was methylated avoiding excess of diazo-

methane and the progress of the reaction followed every 15 min. by TLC on silica gel in the solvent system mentioned. Initially, O-methyl-psychotrine (R_f 0.62) and psychotrine (R_f 0.26) was formed in traces with a third component (R_f 0.40) presumably IV or V as the major product. Psychotrine could not be detected after 1 hr. and the amount of O-methyl-psychotrine progressively increased up to 20 hr when the two methylated compounds were formed in almost equal amounts. Obviously, the methylation at position 6' is more facile than that in ring A. The acid hydrolysis (vide supra) is also expected (11) to preferentially cleave the methoxy group at position 7 of psychotrine. We thus favour structure III for desmethylpsychotrine.

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