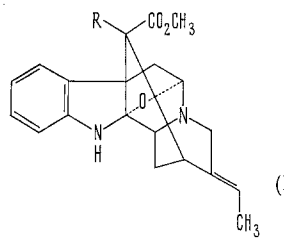
Picralinal - A Key Alkaloid of Picralima Group from *Alstonia scholaris* R. Br.[1]

The reported hypotensive and anticancer activities[2] of the crude extracts of stem-bark of *Alstonia scholaris* R. Br. (Sanskrit: saptaparna; family: Apocynaceae) and our interest in the biosynthesis of non-tryptophan C_{9-10} unit in indole alkaloids[3] led to the detailed investigation of the constituents of this plant. The present communication describes the isolation and constitution of a missing key alkaloid of picralima group from the leaves of *Alstonia scholaris* R. Br.

The concentrated alcoholic extract of the fresh leaves of the plant was macerated with 2*N* tartaric acid and then defatted with light-petroleum. The pH of the aqueous solution was brought down successively to 5 and 9. The weak and strong bases were extracted separately with benzene and ethyl acetate respectively. Column chromatography of the weak bases on neutral alumina gave picrinine (Ia)[4] and a new alkaloid. The ethyl acetate extract similarly gave a compound, mp 236°; $C_{21}H_{24}N_2O_3$ (M^+, 352) which was characterized as akuammidine[5].



(I) a: R = H
b: R = CHO
c: R = CH_2OH

The new alkaloid, $C_{21}H_{22}N_2O_4$ (M^+, 366), mp 179–180°, $[\alpha]_D^{30}$ – 179.7° ($CHCl_3$; c, 1.78); showed an UV-spectrum at λ_{max} (EtOH) 237 and 293 nm (log ε 3.87 and 3.43 respectively) characteristic of an indoline system. The IR-spectrum ($CHCl_3$) supported the presence of an NH group (3370 cm^{-1}) and indicated an ester C=O (1730 cm^{-1}, shoulder) and an aldehyde function (1720 and 2750 cm^{-1}). The NMR-spectrum ($CDCl_3$) showed the following signals: τ 8.49, dd (J 2 and 7 Hz), 3, $=C<^{CH_3}_{H}$; 6.30, s, 3, CO_2CH_3; 5.15, d (J 2.5 Hz) 1, $O>CH$; 4.59, bq (J 7 Hz), 1, $=C<^{CH_3}_{H}$; 4.47, bs, 1, N*H*; 2.56–3.44, m, 4 ar. *H*; 1.42, s, 1, *H*C=O.

Sodium borohydride reduction of the base afforded an alcohol, mp 194–195°. The NMR-spectrum of the latter was similar to that of the new base, except that the aldehydic proton singlet had been replaced by signals at τ 6.40 (2H) and 6.42 (1H) respectively corresponding to a CH_2OH group. Further, treatment of this alcohol with aqueous alcoholic potassium hydroxide at 80° for 15 min readily gave a compound, $C_{20}H_{22}N_2O_3$, formed by the loss of elements of formaldehyde and identical with picrinine. It is obviously a retroaldol type of reaction involving $HO\cdot CH_2\cdot \overset{|}{C}\cdot CO_2CH_3$ grouping. The alcohol was thus identified as desacetylpicraline (Ic)[6].

The foregoing evidence led to the constitution (Ib) for the new base identical with picralinal prepared earlier by BRITTEN and SMITH[6] by the chromic acid oxidation of (Ic). This assignment received support from the conversion of picralinal to (Ia) on alkali treatment and by its mass spectrum which showed, apart from the M^+ peak, abundant ions at *m/e* 338, 337 (base peak, M-29), 307 (M-59), 277 [M-(29 + 59 + 1)], 239 (M-127, due to loss of OHC–C–CO_2CH_3 together with CO derived from C-5 and a H transfer), and 130.

In view of the present status of the biogenetic theory concerning indole alkaloids, picralinal would appear to be a key intermediate for the biosynthesis of several indole alkaloids (i.e., picraline, desacetylpicraline, vincaricine[7], picrinine and echitamine). The present isolation of this hitherto missing alkaloid provides an additional example of a natural product previously known as a semi-synthetic laboratory product[8,9].

Zusammenfassung. Aus den Blättern von *Alstonia scholaris* R. Br. sind Pikrinine (Ia), Akuammidine und ein neues, bisher in Pflanzen nicht gefundenes Alkaloid, Pikralinal (Ib) isoliert worden. Pikralinal ist eine Schlüsselsubstanz für die Biosynthese vieler Alkaloide des Pikralimatypus.

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8 Communication No. 1507 from the Central Drug Research Institute, Lucknow.
9 Since the submission of this manuscript, we have come across the work of D. A. EVANS, J. A. JOULE and G. F. SMITH, Phytochemistry, *7*, 1429 (1968) wherein they have reported the isolation of picralinal from Rhyza stricta.

Fluorescent Metabolites in Mold-Damaged Wheat Flour

Cereals stored at elevated temperatures and high moisture levels show rapid increases in mold count and extensive lipid breakdown[1,2]. In the case of wheat flour, the breadmaking properties are seriously impaired and deterioration is accompanied by the formation of several fluorescent compounds of unknown structure[3]. The possibility that those compounds were fungal toxins[4] prompted further investigation.

Four wheat flours (with moisture contents of about 18%) stored for about 16 weeks at temperatures of 23, 30 or 37 °C showed a decrease in petroleum-ether-extractable lipids from 0.75–0.89% to 0.17–0.36% and an