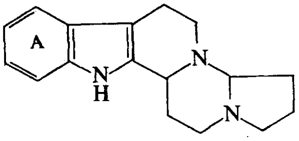
Elaeocarpidine, a New Indole Alkaloid from *Elaeocarpus archboldianus* A.C.Sm.

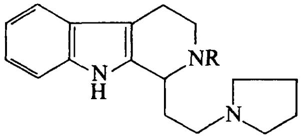
By S. R. JOHNS, J. A. LAMBERTON, and A. A. SIOUMIS

(*Division of Applied Chemistry, C.S.I.R.O., Chemical Research Laboratories, Box* 4331 *G.P.O., Melbourne, Australia*)

ELAEOCARPIDINE, m.p. 229—230° $[\alpha]_D \pm 0°$ in $CHCl_3$, the major alkaloid isolated from the leaves of *Elaeocarpus archboldianus* A.C.Sm. and the first indole alkaloid of the family Elaeocarpaceae, has been shown to be (I). Elemental analysis and an M^+ peak at m/e 267 indicated the molecular formula $C_{17}H_{21}N_3$, and (I) was characterized spectroscopically as an indole [λ_{max} (EtOH) 226 mμ (ϵ 39,800), 283 (8,000), λ inflect., 290 (6,750); ν_{max} ($CHCl_3$) 3510 cm.$^{-1}$ and broad NH singlet at δ 7·68 in the 60 Mc./sec. n.m.r. spectrum* from proton exchangeable with D_2O] unsubstituted in ring A (four-proton multiplet between 415—455 c./sec.), with only one exchangeable proton (M^+ 268 after D_2O exchange). Strong Bohlmann bands between 2500—2800 cm.$^{-1}$ in the i.r. spectrum are consistent with the structure assigned.



(I)



(IIa) R=H
(IIb) R=Ac

Chemical proof of the structure of elaeocarpidine depends upon the formation of 1-ethyl-β-carboline on selenium dehydrogenation and on a study of dihydroelaeocarpidine (IIa). The labile nature of the N–CH–N system of (I) is shown by the formation on catalytic hydrogenation in glacial acetic acid solution of dihydroelaeocarpidine (IIa). Dihydroelaeocarpidine, m.p. 123—125, M^+ 269, has two exchangeable protons (M^+ 271 after D_2O exchange) and in pyridine–acetic anhydride solution, affords an *N*-acetyl derivative (IIb) [ν_{max} ($CHCl_3$) 1635 cm.$^{-1}$; three-proton singlet at δ 2·18]. The structure of (IIb) was established by Hofmann degradation (aqueous NaOH at 180°) of the methiodide of (IIb), which afforded *N*-methylpyrrolidine as the only volatile, basic product.

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* N.m.r. spectra were measured in $CDCl_3$ solution on a Varian A60 spectrometer and chemical shifts are relative to tetramethylsilane.