THE ALKALOIDS OF Neolitsea pubescens (LAURACEAE)

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The bark of Neolitsea pubescens (Teschn.) Merr. (family Lauraceae) affords a high yield of alkaloids (1.2%) and the major constituents have been identified as the known aporphine alkaloids roemerine, N-methylaurerotetanine, boldine, and laurolitsine. Similar alkaloids have been isolated from various parts of the Japanese species Neolitsea sericea, the bark of which contains boldine1 and the leaves boldine, laurolitsine, roemerine, and litsericine.2 Another species, Neolitsea pulchella, contains the aporphine alkaloid neolitsine.3

Bark of Neolitsea pubescens was collected from a tree (20 ft high, 4 in. diameter) growing in mountain forest at an elevation of 8600 ft at Marafunga in the Eastern Highlands District of the Territory of New Guinea (Voucher specimen TGH 13,225).

**Experimental**

Milled, dried bark of N. pubescens (750 g) on extraction by the method used previously4 afforded 9.0 g of crude alkaloids. The alkaloids were separated by chromatography on a column of alumina that had been made neutral by treatment with ethyl acetate. Quantitative yields for the individual alkaloids cannot be given, but roemerine, boldine, and N-methylaurerotetanine and laurolitsine are all major constituents, with laurolitsine predominant.

(i) Roemerine.—A series of fractions eluted from the column by benzene gave a colourless gum on evaporation. Thin-layer chromatography showed the presence of mainly one component, which formed a sparingly soluble hydrochloride on addition of aqueous hydrochloric acid. Recrystallization from water gave roemerine hydrochloride as colourless needles, m.p. 245-2450, [α]D -47° (c, 0.11 in ethanol). The n.m.r. and i.r. spectra of the free base regenerated from the hydrochloride were identical with those of roemerine isolated from Xylopia papuana,5 and the identification was confirmed by direct comparison with authentic roemerine.

(ii) N-Methylaurerotetanine.—Continued elution with benzene gave a second constituent, further amounts of which were eluted by benzene containing 1-5% chloroform. This material would not crystallize but it was obtained as a colourless powder, [α]D +78° (c, 0.80 in CHCl3), and was shown to be identical with authentic N-methylaurerotetanine by comparative thin-layer chromatography and by the identity of the n.m.r. and i.r. spectra of the two samples.

(iii) Boldine.—Fractions eluted by benzene containing a greater proportion of added chloroform contained another component that crystallized from chloroform in colourless needles, m.p. 162-163°, [α]D +110° (c, 0.13 in ethanol). The physical constants determined for this alkaloid are in agreement with those of the known alkaloid boldine,6 and its identity with boldine was confirmed by its spectroscopic properties. The mass spectrum showed a molecular ion peak at m/e 327 and the 100-Mc/s n.m.r. spectrum was typical of a 1,2,9,10-tetrasubstituted aporphine. The signals were assigned as follows: three-proton singlet at δ 2.49 (N-methyl), three-proton

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1 Nakasato, T., and Nomura, S., Yakugaku Zasshi, 1957, 77, 816.

singlet at $\delta 3.55$ (C1-methoxyl), three-proton singlet at $\delta 3.80$ (C10-methoxyl), and three one-proton singlets at $\delta 6.53$, $\delta 6.73$, and $\delta 7.88$ (C3, C8, and C11 aromatic protons respectively).

(iv) Laurolitsine.—The material from the fractions eluted by chloroform–methanol was obtained as a colourless gum that could not be crystallized. Comparative thin-layer chromatography and the n.m.r. spectrum of the crude material indicated that it was largely composed of laurolitsine, and acetylation with acetic anhydride–pyridine at room temperature, followed by mild treatment with dilute sodium hydroxide solution in order to hydrolyse O-acetyl groups, gave N-acetyllaurolitsine, which crystallized from chloroform in colourless needles, m.p. 255–260°, $[\alpha]_D +374^\circ$ (c, 0.12 in CHCl₃). The identification of N-acetyllaurolitsine was confirmed by comparison with authentic N-acetyllaurolitsine (i.r. spectrum, mixed m.p.).

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