OXOANOLOBINE, A NEW OXOAPORPHINE ALKALOID FROM GUATTERIA MELOSMA

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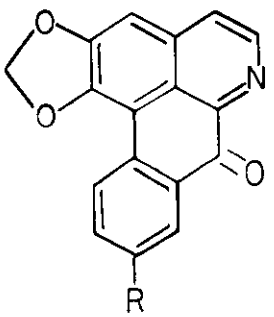
Abstract - Oxoanolobine (1), a new alkaloid from an alcoholic extract of Guatteria melosma Diels (Anonaceae), was characterized as 1,2-methylenedioxy-9-hydroxyoxoaporphine (10-hydroxy-8H-benzo[g]-1,3-benzodioxolo[6,5,4-de]quinolin-8-one) by physicochemical data and conversion to lanuginosine (2).

An alcoholic extract (654 g) of Guatteria melosma[1] (27.2 kg) was submitted to an acid-base partition procedure. Subsequent silicic acid chromatography of the basic fraction afforded oxoanolobine (1) (50 mg) as an orange amorphous solid from methanol; mp 270-275° (dec); $[\alpha]_D^{28}$ 0° (c 1.0, MeOH); uv λ_{max}^{MeOH} nm 217 (log ε 4.24) 249 (4.43), 274 (4.35), 324(sh) (3.84), 370 (3.65) and 442 (3.76), $\lambda_{max}^{MeOH\ +0.1N\ HCl}$ nm 220 (log ε 4.29) 260 (4.41), 287 (4.31), 345 (3.72), 395 (3.73) and 510 (3.51); $\lambda_{max}^{MeOH\ +0.1N\ NaOH}$ nm 222 (log ε 4.29), 253 (4.38), 291 (4.42), 334(sh) (4.01), 372 (3.48) and 506 (3.42); ir ν_{max}^{KBr} cm^{-1} 3420 (br), 1660(C=O). The nmr spectrum (60 MHz, TFA, TMS, δ in ppm) indicated the presence of one methylenedioxy group at 6.60 (2H,s), a C-3 aromatic proton at 7.47 (1H,s) an aromatic AB system for C-4 at 8.37 (1H,d,J=6Hz) and C-5 at 8.65 (1H,d,J=6Hz) and an aromatic AMX system for C-8, C-10 and C-11 at 7.98 (1H,d,J=2.5Hz), 7.59 (1H,dd,J=8,2.5Hz) and 8.70 (1H,d,J=8Hz), respectively. The ms showed a M+ at m/e 291 (100%) for $C_{17}H_9NO_4$, 263(8), 233(15) and 178(10) with metastable ions at m/e 237.3 for the transition 291→263 (m^*_{calc}237.7) and 206.4 for the transition 263→233 (m^*_{calc}206.4). These spectral data indicated that 1 was 1,2-methylenedioxy-9-hydroxyoxoaporphine.

Treatment of oxoanolobine (1) with ethereal diazomethane gave an O-methyl derivative (lanuginosine) (2) as yellow needles from methanol; mp 314°; $[\alpha]_D^{28}$ 0° (c 1.0, MeOH); ms M+ m/e 305(100%), 304(56), 290(5), 276(20), 275(40) and 234(16). O-Methyloxoanolobine was identical (ir, uv, ms, mmp) with authentic lanuginosine[2], thus confirming that 1 was 1,2-methylenedioxy-9-hydroxyoxoaporphine (10-hydroxy-8H-benzo[g]-1,3-benzodioxolo[6,5,4-de]quinolin-8-one)[3].



1 R = OH
2 R = OCH_3
3 R = H

Oxoaporphine alkaloids have been found in several plant families in addition to the Anonaceae. These include the Araceae, Hernandiaceae, Lauraceae, Magnoliaceae, Menispermaceae, Monimiaceae, Papaveraceae, Ranunculaceae and Eupomatiaceae.[4,5] Although liriodenine (3) has reported broad spectrum antimicrobial activity[6,7] and activity against 9-KB tissue culture cells[8], little is known about the pharmacological activity of other members of this group of alkaloids.

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3. The authors are grateful to Kurt L. Loening, Nomenclature Director, Chemical Abstracts Service, Columbus, Ohio for providing the correct IUPAC name for oxoanolobine.
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