Tetrahedron Letters,Vol.24,No.8,pp 761-762,1983 0040-4039/83/080761-02$03.00/0
Printed in Great Britain

(+) MELONINE AND N_B-OXY MELONINE, A NEW INDOLINE SKELETON

S. BAASSOU, H.M. MEHRI, A. RABARON and M. PLAT

Laboratoire de Pharmacie Chimique II, Faculté de Pharmacie
Université de PARIS-SUD 11 rue J-B. Clement 92290 CHATENAY-MALABRY

SUMMARY : *From Melodinus celastroides Baill.(Apocynaceae) were isolated melonine and its N_b-oxide. Their indoline skeleton is new and described here for the first time.*

The Melodinus genus includes numerous species, some of which are endemic in New Caledonia and contain various indole alkaloids mostly belonging to the aspidospermane-eburnane series or its rearranged derivatives like vallesamidine or scandine (1-4).

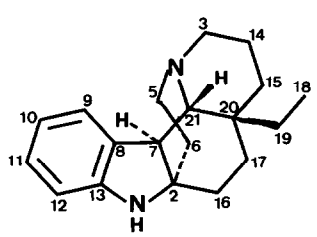
A new skeleton originating from aspidospermane series is reported below : (+) melonine 1a and its N_b-oxide 1b were isolated from Melodinus celastroides Baill. (Apocynaceae) (5).

The structure of 1a, $C_{19}H_{26}N_2$, $[\alpha]_{578}^{22}$ +82°, m.p.(hydrochloride) 262°C, UV λ_{max} (log ε) 248 (3.80), 298 (3.45), is settled by comparison of its ^{13}C NMR spectrum with those of (-)N_a-norvallesamidine 2 and (+) aspidospermidine 3 related to andrangine (6) and to 16-β carbomethoxy aspidospermidine (7).

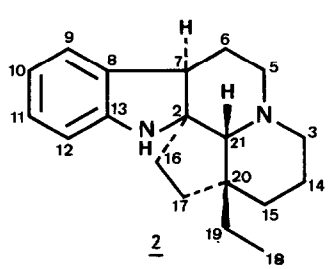
An ethyle side chain is carried by a quaternary carbon as shown by ^1H NMR pattern and the C-18 shift (7.4 p.p.m.).

In 1a and 2, aromatic C-8 shifts are similar (128.8 and 131.7 p.p.m. respectively). Moreover in 1a, C-2 is quaternary and C-7 tertiary as in 2, contrarily to 3.

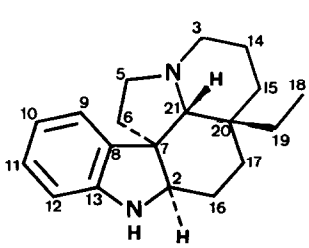
C-7 shifts are almost identical (45.1 vs 44.4 p.p.m.) whereas C-2 shifts differ by 8.6 p.p.m. (Table I). This can be consistent with a size-enlargement of one of the three rings fused to C-2.



1a (+) melonine
1b N_b-oxy (+) melonine



2



3

	C-2	C-3	C-5	C-6	C-7	C-8	C-9	C-10	C-11	C-12
1a	66.8	57.2	48.0	35.1	45.1	128.8	122.6	118.4	128.4	109.5
1b	68.9	78.3	65.6	35.8	44.8	129.3	122.4	119.5	128.4	110.3
2	75.4	52.8	50.6	24.7	44.4	131.7	122.8	118.5	127.3	108.8
3	65.4	53.7^{+}	52.9^{+}	38.7	52.9	135.6	122.7	118.8	127.0	110.1

	C-13	C-14	C-15	C-16	C-17	C-18	C-19	C-20	C-21
1a	149.4	18.4	33.9^{+}	24.9	18.4	7.4	33.2^{+}	34.4	57.2
1b	148.5	23.4	34.2	24.9	16.4	7.5	34.2	35.0	73.9
2	149.9	20.3	28.5	34.4^{+}	35.7^{+}	8.6	33.4^{+}	45.1	75.4
3	149.3	21.6	34.3	23.0	28.1	6.6	29.8	35.5	71.1

Table I : ^{13}C chemical shifts ($CDCl_3$ solutions, reference TMS)
(+) possible inversion of assignments

The azomethine carbon C-21 undergoes a shift to higher field in 1a (57.2 p.p.m.) vs 2 (75.4 p.p.m.) and 3 (71.1 p.p.m.), due to the loss of a β-effect and the gain of a γ-effect. In 1a, two methylene carbons appear at δ=18.4 p.p.m. One is assigned to C-14 by comparison with 2 (20.3 p.p.m.), the second to C-17, strongly shielded by two diaxial interactions with protons located on C-5 and C-14 as shown on molecular models of 1a.

On the basis of these data, structure 1a is attributed to melonine. By heating 1a (200°C) under vacuum, transposition lead to 2 and 3, identified by physical and chromatographical comparison with authentic samples (+). This settles the stereochemistry of 1a.

1b, $C_{19}H_{26}N_2O$, m.p. 198°C, $\{\alpha\}_{578}^{22}$ +110°, is reduced to 1a by Fe-AcOH. Its ^{13}C NMR spectrum fits well with the structure of N_b-oxy (+) melonine (Table I).

(+) We are grateful to Pr LEVY for samples and to Pr WENKERT and G. LUKACS for discussions.

REFERENCES

(1) a-H. MEHRI, M. PLAT, P. POTIER, Ann. Pharm. Franç.(1971), 29, 291.
b-M. PLAT, H. MEHRI, M. KOCH, U. SCHEIDEGGER, P. POTIER, Tetrahedron Lett.(1970), 3395.
(2) H. MEHRI, A. RABARON, T. SEVENET, M. PLAT, Phytochem.(1978), 17, 1451.
(3) A. RABARON, L. LE MEN-OLIVIER, J. LEVY, T. SEVENET, M. PLAT, Ann. Pharm. Franç.(1981), 39, 369.
(4) a-M. DAUDON, H. MEHRI, M. PLAT, E. HAGAMAN, F. SCHELL, E. WENKERT, J. Org. Chem.(1975), 40, 2839.
b-M. DAUDON, H. MEHRI, M. PLAT, E. HAGAMAN, E. WENKERT, J. Org. Chem.(1976), 41, 3275.
(5) S. BAASSOU, H. MEHRI, A. RABARON, M. PLAT, T. SEVENET, Ann. Pharm. Franç.(1981), 39,167.
(6) J. BRUNETON, A. CAVE, A. AHOND, A. BUI, H.P. HUSSON, C. KAN, P. POTIER, Tetrahedron Letters, (1973), 5081.
(7) G. LUKACS, M. DE BELLEFON, L. LE MEN-OLIVIER, J. LEVY, J. LE MEN, Tetrahedron Letters, (1974), 487.

(Received in France 14 November 1982)