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THE SYNTHESIS OF SANGUINARINE

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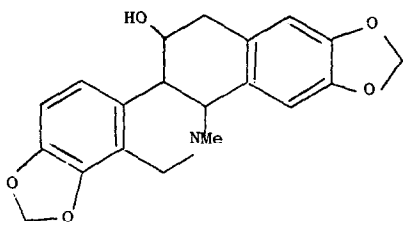
The elucidation of the structure of the benzo[c]phenanthridine alkaloid chelidonine (1) has been well summarised by Manske[1] and by Crawford[2]; in the course of the work chelidonine was transformed oxidatively into the N-methylbenzo[c]phenanthridinium salt (2), which was shown to be identical with the alkaloid sanguinarine.

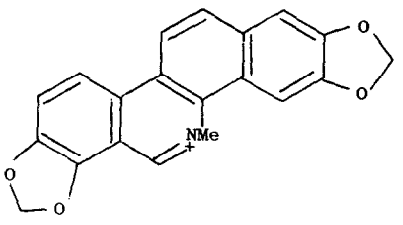
We wish now to report the first synthesis of this latter alkaloid along the lines that we have established[3] for the preparation of other compounds of this group. The chart summarises the essential steps[4] involved. The final product, obtained in 4% overall yield from 2-3-methylenedioxybenzaldehyde, was found to be identical (superimposable UV and IR spectra and mixed m.p.) with an authentic sample[5] of sanguinarine chloride.

REFERENCES

1. R.H.F. Manske in The Alkaloids ed. R.H.F. Manske and H.L. Holmes, Academic Press, New York, Vol. IV, 1954 p. 253.
2. J.V. Crawford in Weissberger's The Chemistry of Heterocyclic Compounds; Six-Membered Heterocyclic Nitrogen Compounds with Four Condensed Rings ed. C.F.H. Allen, Interscience New York, 1951, p. 160.
3. S.F. Dyke, M. Sainsbury and B.J. Moon, Tetrahedron, 24, 1467 (1968).
4. Satisfactory Analyses and Spectral Data were secured for all compounds described.
5. It is a pleasure to thank Dr. J. Slavik, Institute of Medicinal Chemistry, Purkyne University, Czechoslovakia for a sample of sanguinarine chloride.

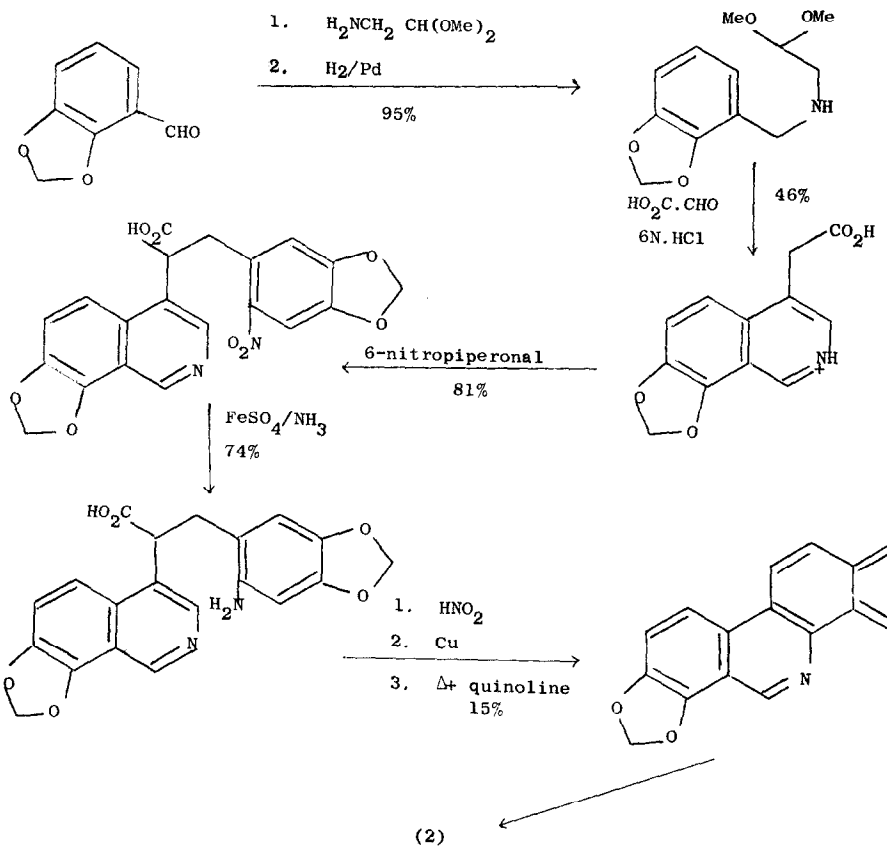


(1)



(2)

CHART I


1. $H_2NCH_2CH(OMe)_2$
2. H_2/Pd
95%
CHO
MeO
OMe
NH
$HO_2C.CHO$
6N.HCl
46%
CO_2H
NH
6-nitropiperonal
81%
HO_2C
O_2N
N
$FeSO_4/NH_3$
74%
HO_2C
H_2N
N
1. HNO_2
2. Cu
3. Δ+ quinoline
15%
N

(2)