ninhydrin as spray reagent. Leucine, valine and *N*-monomethylalanine were identified by comparison with authentic samples.

Compound **1** (7 mg) was deformylated by treatment with 0.5 N HCl in MeOH at room temp. for 45 hr. It was purified by prep. TLC and crystallization from MeOH furnished compound **4**, mp 179–180°, which was identified as nummularine-P (mmp, co-TLC and superimposable IR). Compound **4** (4.5 mg) was treated with HCHO and $NaBH_4$ and the reaction product purified by prep. TLC and crystallisation from MeOH gave the *N*-methylated product, compound **5**, mp 91–92°. Compound **5** was identified as sativanine-H by direct comparison with an authentic sample (mmp, co-TLC and superimposable IR).

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REFERENCES

1. Kirtikar, K. R. and Basu, B. D. (1975) *Indian Medicinal Plants* Vol. 1, p. 594. Lalit Mohan Basu, Allahabad.
2. Tschesche, R., Shah, A. H., Pandey, V. B., Singh, J. P., Radloff, M. V. and Eckhardt, G. (1981) *Pharmazie* **36**, 511.
3. Shah, A. H., Pandey, V. B., Eckhardt, G. and Tschesche, R. (1985) *Phytochemistry* **24**, 2768.
4. Shah, A. H., Al-Yahya, M. A., Devi, S. and Pandey, V. B. (1987) *Phytochemistry* **26**, 1230.
5. Tschesche, R., David, S. T., Uhlendorf, J. and Fehlhaber, H. W. (1972) *Chem. Ber.* **105**, 3106.
6. Shah, A. H., Pandey, V. B., Eckhardt, G. and Tschesche, R. (1984) *Phytochemistry* **23**, 931.
7. Dwivedi, S. P. D., Pandey, V. B., Shah, A. H. and Eckhardt, G. (1987) *J. Nat. Prod.* (in press).
8. Shah, A. H., Miana, G. A., Devi, S. and Pandey, V. B. (1986) *Planta Med.* 500.
9. Shamma, M. (1972) *The Isoquinoline Alkaloids*, p. 40. Academic Press, New York.
10. Manske, R. H. F. (1937) *Can. J. Res.* **B15**, 159.
11. Tschesche, R., Kaußmann, E. U. and Fehlhaber, H.-W. (1974) *Chem. Ber.* **105**, 3094.

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A *SECO*-PHTHALIDEISOQUINOLINE ALKALOID FROM *FUMARIA INDICA* SEEDS

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Key Word Index—*Fumaria indica*; Fumariaceae; seed; *seco*-phthalideisoquinoline alkaloid; narceimicine.

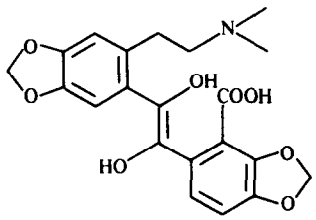
Abstract—From the seeds of *Fumaria indica*, a previously undescribed *seco*-phthalideisoquinoline alkaloid, narceimicine, has been isolated and its structure established by spectroscopic methods.

INTRODUCTION

In continuation of our work on the alkaloids of *Fumaria indica* seeds [1–5], we report here the isolation and characterization of a new alkaloid, designated narceimicine.

RESULTS AND DISCUSSION

Chromatographic resolution of the crude base fraction of the defatted seeds of *F. indica* furnished pale yellow granules of narceimicine, mp 242–246° (MeOH–H_2O), $C_{21}H_{21}NO_8$ ($[M]^+$, *m/z* 415). It showed characteristic UV absorption maxima comparable with those of *trans*-stilbene [6]. The presence of a carboxylic group in the molecule was indicated by a band at 1670 cm^{-1} in the IR spectrum and a positive colour test with Bromothymol Blue. The 90 MHz ^1H NMR (CF_3CO_2D) spectrum of narceimicine is comparable with that of narceimine (**2**) [7] and showed signals for two methylenedioxy groups as a pair of 2H singlets at δ6.12 and 6.31, two *N*-methyl groups centred at δ3.05, two isolated aromatic hydrogens as singlets at δ7.49 and 6.96 and two vicinal aromatic hydrogens as an AB quartet at δ7.47 and 7.16 (*J*



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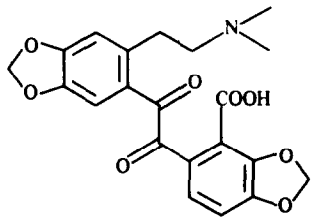

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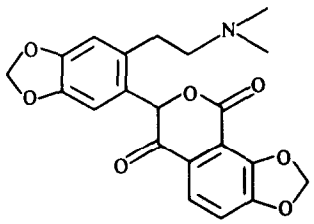

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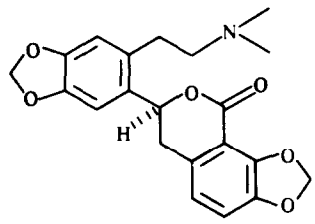

3

$=8$ Hz), in addition to a 4H broad singlet at $\delta 3.52$ for two methylenes of a dimethylaminoethyl side chain. The ^{1}H NMR spectral similarity of narceimicine with that of narceimine and the fact that the $[M]^+$ peak of the former is two mass units higher than that of the latter led to the logical inference that narceimicine has an α-ketol system instead of a diketone as is present in narceimine. This assumption gained credence from the characteristic colour reaction of α-ketols with cupric acetate [8]. But the fact that the ^{1}H NMR spectrum of narceimicine lacks a carbinyl hydrogen signal as can be expected from α-ketol, it was assumed that the alkaloid exists in the endiol form (**1**). The mass spectrum of **1** showed a $[M]^+$ at *m/z* 415 and an important peak at *m/z* 397 ($[M-H_2O]^+$, ion **a**), which underwent a fragmentation pattern comparable to peshawarine (**3**) [9].

EXPERIMENTAL

Dried and powdered seeds of *F. indica* (Haussk) Pugsley (3 kg) were successively extracted with petrol (60–80°) and EtOH (95%) in a Soxhlet extractor. The EtOH ext was concd to a dark brown syrup and stirred with aq citric acid (7%) for 10 hr. The acidic soln was basified with NH_4OH and exhaustively extd with $CHCl_3$. The $CHCl_3$ ext was subjected to CC on silica gel with solvents of increasing polarity.

Narceimicine (**1**). Fractions from $CHCl_3$–MeOH (9:1) elution were combined according to TLC, and on concn they furnished a light yellow solid. Crystallization from MeOH–H_2O furnished light yellow granules of narceimicine (15 mg), $C_{21}H_{21}NO_8$ ($[M]^+$, *m/z* 415), mp 242–246° (dec.), R_f 0.21 (MeOH), 0.58 (MeOH–H_2O, 9:1): sol in HOAc, sparingly sol. in Me_2CO, MeOH and insoluble in $CHCl_3$. It gave a yellow colour with Bromothymol Blue and a reddish yellow one with Dragendorff's reagent. The alkaloid exhibited a brown–red colouration both on silica gel TLC plate and PC after spraying with a MeOH soln of cupric acetate and heating them to 60°. UV λ_{max} (MeOH): 228 (4.10), 300 (4.38), 310 sh (4.18), 330 (4.42) nm; IR ν_{max} (KBr) 1670, 1620, 1495, 1250 cm^{-1}; MS: *m/z* 415 ($[M]^+$, 3%), 397 (60), 352 (7), 322 (10), 222 (20), 206 (15), 203 (12), 164 (7), 163 (5), 150 (12), 149 (9), 135 (10), 134 (7), 58 (100).

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REFERENCES

1. Pandey, V. B., Ray, A. B. and Dasgupta, B. (1974) *Curr. Sci.* **43**, 748.
2. Bhattacharya, S. K., Pandey, V. B., Ray, A. B. and Dasgupta, B. (1976) *Arzneimittel Forsch.* **26**, 2187.
3. Pandey, V. B., Ray, A. B. and Dasgupta, B. (1979) *Phytochemistry* **18**, 695.
4. Kumar, A., Pandey, V. B., Seth, K. K., Dasgupta, B. and Bhattacharya, S. K. (1986), *Planta Med.* 324.
5. Tripathi, Y. C. and Pandey, V. B. (1987) *Pharmazie* (in press).
6. Silverstein, R. M., Bassler, C. G. and Morrill, T. C. (1974) *Spectrometric Identification of Organic Compounds* 3rd Edn, p. 251, Wiley, New York.
7. Seth, K. K., Pandey, V. B., Ray, A. B., Dasgupta, B. and Shah, S. A. H. (1979) *Chem. Ind.* 744.
8. Fieser, L. F. and Fieser, M. (1967) *Reagents for Organic Synthesis* Vol. 1, p. 159.
9. Shamma, M., Rothenberg, A. S., Jayatilake, G. S. and Hussain, S. F. (1978) *Tetrahedron* 635.