Phytochemistry, 1973, Vol 12, p 2059. Pergamon Press Printed in England

2-HYDROXYMETHYL-4-METHOXY-α-PYRONE FROM *OPUNTIA POLYACANTHA*

SADANAND ANANT TELANG

Environmental Sciences Centre (Kananaskis), The University of Calgary, Alberta, Canada T2N 1N4

(*Received* 7 *March* 1973 *Accepted* 23 *March* 1973)

Key Word Index—*Opuntia polyacantha*, Cactaceae, 2-hydroxymethyl-4-methoxy-α-pyrone

Plant Opuntia polyacantha A voucher specimen, identified by Mr J Corbin, is deposited in the Environmental Sciences Centre, University of Calgary *Source* Drumheller, Alberta. *Uses* Medicinal [1] *Previous work* Control of *Opuntia polyacantha* [2,3]

Since some cacti species are known to contain alkaloids,[4,5] our main interest was to study the alkaloidal content of *Opuntia polyacantha* However, from the alkaloidal fraction (positive Mayer's test) of the dried, powdered plant, we isolated a crystalline, non-nitrogenous, compound m p 180–181°, MS 156 0433(M^+), corresponding to $C_7H_8O_4$ On acetylation it formed a monoacetate m p 111° On the basis of UV, IR and NMR data, the compound was assigned the structure 2-hydroxymethyl-4-methoxy-α-pyrone, opuntiol, and confirmed by a comparison of the physical data and a m m p with an authentic sample [6]

EXPERIMENTAL

The dried (46–48°, *ca* 10% of the wet wt), powdered plant (500 g), collected in June 1972, was extracted with 95% EtOH and 0 5% AcOH for 2 days The extracts were concentrated *in vacuo*, treated with 1 5 N H_2SO_4 (250 ml) and extracted with Et_2O The acidic solution (positive Mayer's test) was then basified (Na_2CO_3) and extracted with Et_2O in a liquid–liquid contractor The Et_2O solution was re-extracted with 1 5 N H_2SO_4, the acid–base extraction was repeated and the final Et_2O extract was dried ($MgSO_4$), and concentrated, leaving 320 mg of a dark brown residue

The crude mixture was chromatographed on Al_2O_3 (30 g, Woelm, neutral, activity Gr IV) with 250 ml each of $CHCl_3$, $CHCl_3$–Et_2O (1 1), Et_2O, Et_2O–Me_2CO (1 1), Me_2CO, Me_2CO–MeOH (19 1) and MeOH respectively The $CHCl_3$–Et_2O eluate yielded opuntiol (35 mg), crystallized from $CHCl_3$, m p 180 6–181 1°, UV λ_{max} (EtOH) 280 mμ, IR 3395, 1720, 1700, 1640, 1570 and 1250 cm^{-1} NMR (pyridine-d_5) τ 6 42 (–OMe), 5 50 (–CH_2–), 5 23 (–OH), and two doublets centred at 4 45 and 3 70 (J 2 Hz) *Opuntiol acetate*, prepared in the usual way (Ac_2O–C_5H_5N), crystallized from hexane in colourless needles m p 111 1–111 5°, UV λ_{max} (EtOH) 280 mμ, IR 1735, 1720, 1700, 1650 and 1570 cm^{-1} NMR ($CDCl_3$) τ 7 86, 6 18, 5 16 and two doublets at 4 50 and 3 97 (J 2 Hz)

Acknowledgements—The author wishes to thank Dr M H Benn for helpful discussions and Dr T R Govindachari, Ciba Research Centre, Bombay, for an authentic sample of opuntiol

[1] JOHNSTON, A (1970) *Economic Botany* **24**, 301
[2] THATCHER, A P, DAVIS, G V and ALLEY, H P (1964) *J Range Management* **17**, 190
[3] FENSTER, C R and BURNSIDE, O C (1969) *Weed Sci* **17**, 408
[4] BROWN, S D, MASSINGILL, JR, J L and HODGKINS, J E (1968) *Phytochemistry* **7**, 2031
[5] AGURELL, S (1969) *Lloydia* **32**, 206
[6] GANGULY, A K, GOVINDACHARI, T R and MOHAMED, P A (1965) *Tetrahedron* **21**, 93