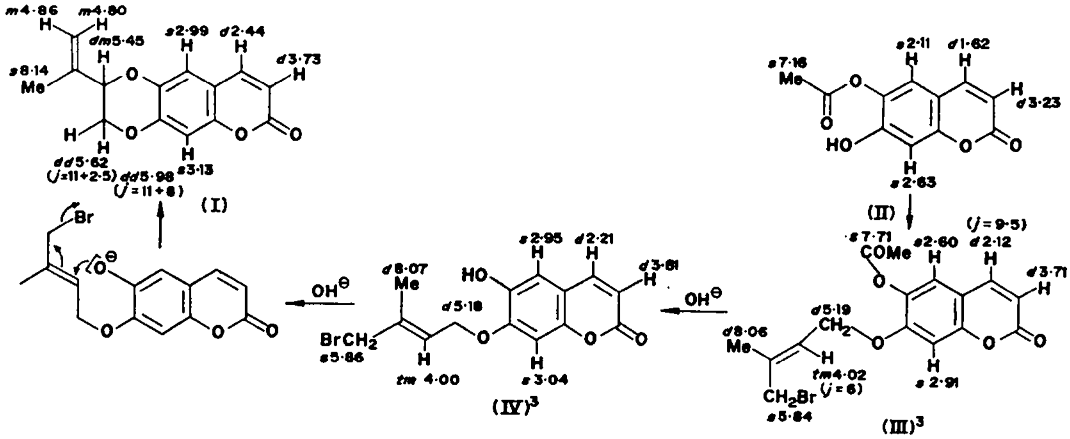
Synthesis of I. 1·0 g aesculetin in acetone was stirred with 1 g powdered KOH and 1·2 equiv. acetyl chloride for 1 hr at 50°. The reaction product, on crystallization from MeOH, yielded colourless crystals (II), m.p. 182° (yield 60%). UV. λ_{max} 345, 298·5, 257 nm (ϵ 10 700, 5700, 4800) 1·0 g (II) in acetone was stirred with 3 g powdered KOH and 3 g 1·4-dibromo-2-methyl-2-butene for 12 hr. After filtration, the residue on chromatography yielded III, crystals from $CHCl_3$–Et_2O–light petrol., m.p. 123°, yield 70%. 60 mg III was warmed at 50° with 60 mg of powdered KOH in 15 ccm DMSO. The reaction product, on chromatography with Et_2O, yielded I, colourless crystals from $CHCl_3$–light petrol., m.p. 145°. IR, UV and NMR spectra identical with those of the natural product (Calc. for ($C_{14}H_{12}O_4$ (244·2): C, 68·85; H, 4·95. Found: C, 68·93, H, 4·94%).



Acknowledgements—We are indebted to Dr. Oliver, Botanical Institute of Stellenbosch for his cooperation in getting the plant material and to Dr. Dean, University of Liverpool, for a sample of obliquin.

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[2] NMR in DMSO-d_6, τ-values.

[3] NMR in acetone-d_6.

Phytochemistry, 1973, Vol. 12, pp. 727 to 728. Pergamon Press. Printed in England.

NOREUGENIN FROM *RHODODENDRON COLLETTIANUM*

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Key Word Index—*Rhododendron collettianum*; Ericaceae; noreugenin.

Plant. Rhododendron collettianum (Aitch and Hemsel).[1] North West Frontier Province, Pakistan. *Uses.* medicinal.[2] *Previous Work.* On sister species.[3] *Present Work.* Dried aerial

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[1] Voucher specimen No. 2765 (PES) deposited at P.C.S.I.R. Herbarium, Peshawar.

[2] R. N. CHOPRA, S. L. NAYAR and I. C. CHOPRA, *Glossary of Indian Medicinal Plants*, p. 213, CSIR, New Delhi (1956).

[3] J. B. HARBORNE and C. A. WILLIAMS, *Phytochem.* **10**, 2727 (1971).

portions extracted successively with light petrol. (60–80°) and EtOH. EtOH extract fractionated by standard methods into neutral, phenolic and basic fractions. Basic fraction was not investigated.

Phenolic fraction. Quercetin (identified by m.p., and m.p. and m.m.p. of pentaacetate). Chromatography on silica gel gave 5,7-dihydroxy 2-methylchromone (noreugenin) $C_{10}H_8O_4$, m.p. 288–291° identified by m.p., NMR and MS: NMR (d_5-pyridine); τ 7·98 (3H, *s*), 3·98 (1H, *s*), 3·50, 3·38 (2H, *AB*-quartet, *J* 2 Hz): (d_6-DMSO); τ −2·78 (2H, *s*) exchangeable with D_2O. τ 3·98 peak broadened by weak coupling with methyl protons, confirmed by double irradiation. MS: *m/e* 192 (M^+), 164 (M-CO), 163, 152 (M-C_3H_4), 124, 96 and an unidentified flavone as yellow needles, m.p. 220–225°, IR (KBr) ν_{max} 1647, 1600 cm^{-1}, UV (MeOH) λ_{max} 245, 292, 335 nm, M^+ *m/e* 302, R_f 0·63 [Whatman No. 1, BAW (4:1:5)]. Acetate m.p. 101–105°. This is the first report of isolation of noreugenin from Ericaceae and only for the second time it has been isolated as a natural product.[4]

Neutral fraction.[5] Sitosterol (identified by m.p. and m.m.p.).

Acknowledgement—We thank Professor Sultan Ahmad of Government College, Lahore for identification of the plant.

[4] E. FUGITA, T. FUGITA and T. ZUZUKI, *Chem. Pharm. Bull. Tokyo* **15**, 1682 (1967).

[5] A number of other compounds have been isolated from this fraction, the chemistry of which will be described later.

Phytochemistry, 1973, Vol. 12, pp. 728 to 729. Pergamon Press. Printed in England.

FLAVONOIDS OF *SWERTIA PURPURASCENS*

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Key Word Index—*Swertia purpurascens*; Gentianaceae; oleanolic acid; swertisin; swertiamarin.

Plant. Swertia purpurascens Wall. *Uses.* Medicinal, used in Pakistan as substitute for *S. chirata*[1] as bitter tonic, stomachic, febrifuge and laxative. *Previous work.* None, but on many sister species.[2]

Present work. The whole plant including roots has been examined. The dried plant material was extracted with MeOH in a Soxhlet apparatus and the methanolic extract concentrated *in vacuo*. The concentrate dissolved in H_2O and extracted with C_6H_6, $CHCl_3$ and *n*-butanol.

Benzene extract. Column chromatography over alumina and elution with C_6H_6 gave *sitosterol*, $C_{29}C_{50}O$, m.p. 137° (m.m.p., acetate, m.p. and m.m.p. 129°). Elution with C_6H_6–MeOH (99:1) gave *oleanolic acid*, $C_{30}H_{48}O_3$, m.p. 305° (I.R., MS, TLC, m.p. of acetate) (Found: C, 78·74; H, 10·57. Calc. for $C_{30}H_{48}O_3$: C, 78·9; H, 10·50%).

[1] R. N. CHOPRA, S. L. NAYAR and I. C. CHOPRA, *Glossary of Indian Medicinal Plants*, p. 237, Council of Scientific and Industrial Research, New Delhi (1956).

[2] M. KOMATSU, T. TOMIMORI, Y. MAKIGUCHI and K. ASANO, *Yakugaku Zasshi* **88**, 832 (1968).