

PLANT MATERIAL.—The plant material was collected from Kumaon Himalayan glaciers in Uttar Pradesh, India at an altitude of 14,000 ft and identified in the department of Botany, Kumaon University, Nainital, where the voucher specimen is stored.

EXTRACTION AND ISOLATION OF CONSTITUENTS.—The whole plant was shade-dried, powdered, and Soxhlet-extracted with 90% EtOH. The EtOH extract was concentrated under vacuo and the residue further extracted with petroleum ether (60–80°). The petroleum ether extract was column chromatographed on Si gel G, eluting with petroleum ether (100%), petroleum ether-C₆H₆ (99:1), petroleum ether-C₆H₆ (98:2), petroleum ether-C₆H₆ (95:5), petroleum ether-C₆H₆ (50:50), and petroleum ether-C₆H₆ (30:70). Compounds **1** and **2** were isolated and purified by repeated tlc and hplc methods.

22-HYDROXYOCTACOSAN-25-ONE [**1**].—Removal of the solvent petroleum ether-C₆H₆ (99:1) afforded a residue (20 mg): mp 70–71° (MeOH); ir (KBr) cm⁻¹ 3440, 2920, 2860, 1705, 1466, 1175, 715; ms *m/z* [M]⁺ 424 (C₂₈H₅₆O₂), 410, 409, 396, 382, 381, 368, 354, 353, 340, 325, 311, 297, 283, 269, 241, 227, 213, 199, 185, 129, 111, 100, 99, 98, 97, 85, 73, 71, 58, 57, 43 (100%), 41; ¹H nmr (CDCl₃) see Figure 1.

24-HYDROXYTRICONTAN-27-ONE [**2**].—Removal of the solvent petroleum ether-C₆H₆ (99:1) afforded a residue (25 mg): mp 73–74° (MeOH), ir (KBr) cm⁻¹ 3440, 2920, 2860, 1705, 1466, 1175, 715; ms *m/z* [M]⁺ 452 (C₃₀H₆₀O₂), 424, 396, 382, 381, 368, 354, 353, 340, 325, 311, 297, 283, 269, 241, 227, 213, 199, 185, 129, 111, 100, 99, 98, 97, 85, 73, 71, 85, 57, 43 (100%), 41; ¹H nmr (CDCl₃) see Figure 2.

ADDITIONAL COMPOUNDS.—The fractions

obtained from MeOH gave tetracosanoic acid (8 mg), mp 83.5° [lit. (5) mp 84.2°], identified by ir, co-tlc, co-hplc, and ms *m/z* [M]⁺ 368 (C₂₄H₄₈O₂). Further elution with petroleum ether-C₆H₆ (95:5) gave hexacosanoic acid (10 mg), mp 86.5° (MeOH) [lit. (5) 87.7°], identified by ir, co-tlc, co-hplc, and ms *m/z* [M]⁺ 396 (C₂₆H₅₂O₂). Eluates from petroleum ether-C₆H₆ (50:50) afforded sitosterol (80 mg), mp 136–137° [lit. (6) 136–137°], identified by mmp, co-tlc, co-hplc, ir, and ¹H nmr; ms *m/z* [M]⁺ 414 (C₂₉H₅₀O). Fractions obtained from EtOAc-C₆H₆ (30:70) afforded sitosterol-β-D-glucoside, (15 mg) mp 280–284° [lit. (6) 284–285°], identified by mmp, ir, co-tlc, co-hplc, ir, fdms [M + H]⁺ 577 (C₃₅H₆₀O₆), and hydrolytic degradation.

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LITERATURE CITED

1. K.S. Khetwal, D.L. Verma, R.P. Pathak, K. Manral, A. Tandon, and M. Joshi, *Indian Drugs*, **22**(3), 126 (1985).
2. K.S. Khetwal, D.L. Verma, and S. Harbola, *Indian Drugs*, in press (1989).
3. H. Bendzikiewics, C. Djerassi, and D. Williams, "Interpretation of Mass Spectra of Organic Compounds," Holden-Day, San Francisco, 1965, pp. 6–7.
4. B. Satoianova-Ivanova and P. Hadjieva, *Phytochemistry*, **8**, 1549 (1969).
5. T.P. Helditch and P.N. Williams, "The Chemical Constituents of Natural Fats," Chapman and Hall, London, 1964, p. 383.
6. Y.N. Shukla and R.S. Thakur, *Phytochemistry*, **24**, 1091 (1985).

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