

SHORT NOTES

INVESTIGATIONS ON THE ROOTS OF *COCCINIA INDICA* W & A.

BY HARI NARAYAN KHASTGIR, SAILENDRA NATH CHOUDHURI AND
PASUPATI SENGUPTA

The roots and leaves of *Coccinia indica* W. & A., syn. *Cephalandra indica* Naud. (Sanskrit : Bimba) of N. O. Cucurbitaceae, are used as a household remedy for diabetes in Bengal and Bihar (Mukherji, *J. Sci. Ind. Res.*, 1957, **16A**, S1). The antidiabetic property of the roots have been studied by De and Mukherji (*Indian J. Med. Sci.*, 1953, **7**, 665).

In the present communication we report our investigations on the unsaponifiable material from the benzene extract of the roots of *Coccinia indica* W. & A. The unsaponifiable material after chromatography over alumina gave two broad fractions. The first fraction on acetylation, followed by fractional crystallisation, gave lupeol acetate and β -amyrin acetate. The second fraction on purification gave β -sitosterol, identified as its acetate.

Isolation of the Unsaponifiable Material.—Dried roots of *Coccinia indica* W. & A. (1.1 kg.) were cut into small pieces and extracted with benzene in a Soxhlet apparatus for 20 hrs. Benzene was distilled off and the residual fat (25 g.) was saponified by refluxing for 6 hours with a solution of KOH (20 g.) in water (20 c.c.) and methyl alcohol (200 c.c.). The saponified mixture was cooled in an ice-bath, diluted with cold water and the unsaponifiable material was extracted with ether. The aqueous layer was rejected and the ether layer was repeatedly washed with cold water, until the wash was neutral. The ether solution was dried over anhydrous sodium sulphate and evaporated, when the unsaponifiable material (5.1 g.) was obtained as a gum.

Chromatography of the Unsaponifiable Material.—The above gummy unsaponifiable material (5.1 g.) was chromatographed over activated alumina (180 g.), when the following broad fractions were collected. Fraction A: 1.45 g. of waxy material, eluted with petroleum ether (b.p. 60-80°) with increasing proportions of benzene, up to petroleum ether:benzene (4:1). Fraction B: 1.15 g. of solid material, m.p. 143-72°, eluted with petroleum ether:benzene (3:2). Fraction C: 0.51 g. of solid material, m.p. 120-28°, eluted with benzene:ether (4:1), immediately followed by Fraction D, 0.05 g. of solid material, m.p. 140-70° whose ultraviolet absorption spectra, λ_{max} 271, 281 and 293 m μ indicate the presence of ca. 20% of a Δ^5 -sterol diene. But the amount of Fraction D was too small for rigorous purification and further investigation.

Examination of Fraction B and Isolation of the Triterpene Alcohols, β -Amyrin and Lupeol as their Acetates.—Fraction B (1.15 g.), m.p. 143-72°, in the above chromatogram was crystallised once from methanol to furnish colorless crystals (0.84 g.), m.p. 150-75°. The melting point of this material could not be raised by

crystallisation from different solvents. So the material (0.84 g.) was converted into the acetate by treatment with pyridine (8 c.c.) and acetic anhydride (8 c.c.). The crude acetate on crystallisation from acetone gave 0.46 g. of a crystalline solid, m.p. 160-205°, which after repeated crystallisation from acetone, gave β -amyrin acetate, m.p. 234-36° (undepressed when mixed with an authentic specimen of β -amyrin acetate), $[\alpha]_D^{25} + 84^\circ$ (CHCl_3). (Found: C, 81.77; H, 11.36. Calc. for $\text{C}_{32}\text{H}_{52}\text{O}_2$: C, 81.99; H, 11.18%).

The mother-liquor from the first crystallisation, above, on concentration gave a crop of crystals (0.25 g.), m.p. 160-70°, which after repeated crystallisations from a mixture of methyl alcohol and acetone and finally from acetone gave lupeol acetate, m.p. 212-14° (undepressed when mixed with an authentic specimen of lupeol acetate), $[\alpha]_D^{25} + 41^\circ$ (CHCl_3). (Found: C, 82.13; H, 11.24. Calc. for $\text{C}_{32}\text{H}_{52}\text{O}_2$: C, 81.99; H, 11.18%).

Examination of Fraction C and Isolation of β -Sitosterol.—Fraction C (0.51 g.), m.p. 120-28°, in the above chromatogram, after several crystallisations from methyl alcohol and then from acetone, gave colorless crystals, m.p. 136-37°, $[\alpha]_D^{25} - 36^\circ.6$ (CHCl_3). The sterol on acetylation with acetic anhydride and pyridine, followed by crystallisation from methyl alcohol, gave β -sitosterol acetate, m.p. 127-28° (undepressed when mixed with an authentic specimen of β -sitosterol acetate), $[\alpha]_D^{25} - 38^\circ$ (CHCl_3). (Found: C, 81.47; H, 11.46. Calc. for $\text{C}_{31}\text{H}_{52}\text{O}_2$: C, 81.52; H, 11.48%).

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