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NOTE

β-Sitosterol-3-O-β-D-Arbinofuronosyl (1→4)-O-L-Rhamnopyranosyl (1→4)-O-β-D-Glucopyranoside from Roots of *Agave Americana* Linn

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Present communication describes the isolation and identification of a new saponin β-Sitosterol-3-O-β-D-arbniofuranosyl-(1→4)-O-α-L-rhamnopyranosyl (1→4)-O-β-D-glucopyranoside from its root.

Agave americana linn. belongs to natural order *Amaryllidaceae* and is widely distributed in temperate and alpine Himalayas from Kashmir to Bhutan at 2400–4200 m altitude. The plant is reputed for medicinal values and present investigation has been undertaken because very little work has been carried out on its roots.

The methanol soluble fraction of the alcoholic extract of the roots of *Agave americana* was treated with excess of solvent ether when a precipitate appeared which when worked by column chromatography yielded a compound m.pt. 249–250° which gave positive test for saponins when shaken with water and also haemolysed red blood cells. Hydrolysis of the saponin (7% H_2SO_4, EtOH) yielded a genin and sugars identified as D-arabinose, L-rhamnose and D-glucose (by CO–PC, CO TLC). The genin crystallized from $CHCl_3$: MeOH (1 : 1) as colourless needles m.pt. 135–137°, $C_{29}H_{50}O$ (M^+ at m/e 414) ($)^{22} = -35$ in $CHCl_3$. The genin formed acetyl derivatives (AC_2O/Py) m.pt. 145–160° (found $C_{81\cdot57}H_{11\cdot84}$ $COCH_3$ 9.4%) (M^+ at m/e 456).

The genin on oppeneaur oxidation gave ketone (β-unsaturated ketone) m.pt. 134–135° indicating 3–β–OH grouping. The IR spectrum of the genin showed prominent peaks at 3360 (OH group) 2907, 1639, 1450, 1379, 1130, 1069, 1020, 997, 957, 840, 800, 757, 719. The NMR spectrum of the mono acetyl genin exhibited signals ($CDCl_3$, TMS) at 0.68 (S–Me–19) 0.77, 0.86, 0.98, 1.14 (4–Me), 2.09 (OAC) 5.12 (H–28) 4.6 (t, H–6).

Therefore, the genin was assigned the as structure β-sitosterol which was confirmed by NMR and co-chromatography with an authentic sample[4].

The saponin hydrolyzed by almoned emulsion (yielding glucose). The first appearance of D-arabinose on partial hydrolysis (2% H_2SO_4) (con-

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sumption of 1 mole of periodate to produce 1 mole of HCOOH per mole of the saponin[5]). Acid hydrolysis of the permethylated saponin (DMS/dry K_2CO_3) yielded 2 : 3 : 6 tri-O-Methyl D-glucose, 3 : 4 di-O-methyl-L-rhamnose and 2 : 3 : 5 tri-O-methyl-D-arbinose (CO–PC and CO–TLC) which indicated the sugar to be β-O-arbinofuranosyl-α-L rhamnopyrronosyl-β-D-glucopyronosyl.

Agave americana Linn. roots were obtained from United Chemicals and Allied products Calcutta and authenticated by Botany Department. The powdered and dried roots (3 kg) were extracted with rectified spirit for 30 days. The extract (3.0 litre) was concentrated under reduced pressure to a dark viscous mass and successively extracted with benzene, chloroform, acetone and methanol. The methanol soluble part on concentration under reduced pressure yielded a brown viscous mass which on addition of excess of solvent ether gave a precipitate which was purified on a column of silicagel. Then acetone : methanol (2 : 1) yielded saponin, m.pt. 249–250°. The homogeneity of the saponin was checked by PC in *n*-butanol : acetic acid : water (4 : 1 : 4) R_f 0.55.

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