

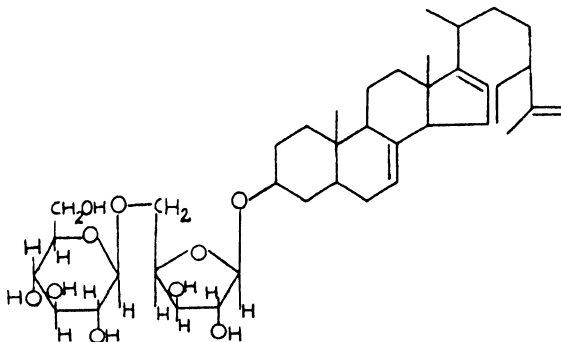
NOTE

A Novel Saponin Stigmasta-7,16,25(26)-triene-3-O- β -D-glucopyranosyl-(1 \rightarrow 5)-O- β -D-xylofuranoside Isolated and Identified from the Stem of *Pithecellobium dulce*

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A novel saponin stigmasta-7,16,25(26)-triene-3-O- β -D-glucopyranoside-(1 \rightarrow 5)-O- β -D-xylofuranoside has been isolated and identified from the stem of *Pithecellobium dulce*.



Key Words: Saponin, Stigmasta-7,16,25(26)-triene-3-O- β -D-glucopyranosyl-(1 \rightarrow 5)-O- β -D-xylofuranoside, *Pithecellobium dulce*.

Pithecellobium dulce^{1,2} (N.O. Leguminosae) is commonly known as 'Jungle Jalebi' or 'Vilayati imali', and is reported to be useful in medicines. Its bark is reported to contain a yellow compound which is used as an astringent in dysentery and as a febrifuge³. Its leaves have been reported to possess astringent, emallient and abortifacient properties. The decoction of the plants is given for enemea.

The present investigation deals with the study of methanol-soluble part of the rectified spirit part. Its stem when worked up by column chromatography yielded a homogeneous saponin. m.f. C₄₀H₆₄O₁₀ (M⁺ = 704); m.p. 157–158°C; [α]_D²² + 22.6 (CHCl₃); IR (KBr): 3416, 3050, 2890, 2810, 1656, 1630, 1428, 1407, 1380, 1346, 1248, 1186, 1046, 1030, 978–958, 800–850; PMR(CDC₃) of acetyl derivative δ 0.71 (d, 3H, *sec.* CH₃), 0.76 (s, 6H, 2X, *sec.* CH₃), 0.81 (m, 3H, primary CH₃), 0.98 (s, 3H, *tert.* CH₃), 1.24–2.00 (complex m, 2.8, methylene protons), 5.50 (dd, 1H, vinylic H), 4.28 (d, 1H, J = 704 Hz, anomeric 1'-H), 4.36 (d, 1H, J = 7 Hz, anomeric 1''-H), 3.5–4.23 (m, 11H, sugar protons), 2.02 (s, 3H, OAc at C-2'), 2.08 (s, 3H, OAc at C-4''), 2.07 (s, 3H, OAc at C-6''); MS, m/z: 704 (M⁺), 541, 520, 415, 392, 378, 300, 272, 235, 215 and 202.

The saponin on hydrolysis afforded the sapogenin and sugars identified as D-xylose, D-glucose (Co-pc and Co-TLC). The sapogenin crystallized from pyridine as light yellow crystals. m.p. 167–68°C; $[\alpha]_D^{22}$ 8.2 (CHCl₃); C₂₉H₄₆O; M⁺ 410. It gave colour reactions characteristic of steroids^{4,5}; IR (KBr): 3415, 3035, 3030, 3008, 2910, 2800, 1245, 1240, 1196, 1155, 1110, 1075, 1050, 980–950, 880–800; (PMR CDCl₃) of acetyl derivative: δ 0.71 (d, 3H, *sec.* CH₃), 0.76 (s, 6H, 2 × CH₃ *sec.*), 0.80 (m, 3H, *primary* CH₃), 0.95 (s, 3H, *tert.* CH₃), 1.20–2.00 (complex m 27, methylene protons), 2.02 (s, 3H, OAc, at C-3), 5.52 (dd, 1H, vinylic H); MS, m/z: 410 (M⁺), 390, 392, 380, 315, 300, 271, 235, 215, 202. The genin was identified as stigmasta-7,16,25(26)-triene-3-O- β -ol by etc fragmentation pattern.

On the basis of periodate oxidation⁶ partial and enzymatic hydrolysis⁷ along with permethylation⁸ studies confirmed that the saponin consists of one molecule each of D-xylose and D-glucose and that D-glucose was present in pyranose form while D-xylose in furanose form. It also indicated that D-xylose unit was attached to sapogenin, while D-glucose was the terminal sugar and that all the glycosidic linkages were of β -type in the saponins.

About 3 kg of stems were procured locally and authenticated by Botany Department of the College, were air-dried, crushed and extracted with 95% ethanol. The extract was concentrated to a dirty green viscous mass which was subsequently extracted successively with benzene, chloroform, ethyl acetate, acetone and methanol. The methanol-soluble fraction on concentration gave a dirty green viscous mass which on addition of excess of solvent ether gave a precipitate; the latter on being subjected to addition of excess of solvent ether gave a precipitate; the latter was subjected to purification by column chromatography, using silica gel; the acetone-methanol eluate yielded the saponin (0.06%).

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