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NOTE

Polyalcohols from *Cassia alata* Linn. Seeds

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Periodate oxidized carbohydrate of *Cassia alata* Linn. seeds on reduction produced polyalcohols as glycerol and erythritol in 0·81 : 2·56 moles.

Cassia alata Linn. (Caesalpiniaceae) plant is grown in Northern India. Nature of sugars,[1] methylation and periodate oxidation[2] have been reported. The present manuscript deals with polyalcohols by Smith degradation[3] of periodate oxidized carbohydrate for confirmation of biochemical structure.

Separation of polyalcohols was carried out on Whatman No. 3 mm paper by chromatography in solvents (v/v): (A) *n*-butanol-ethanol-water (4 : 1 : 5, upper phase)[4]; (B) ethyl acetate-pyridine-water (2 : 1 : 2, upper phase)[5] and (R_1) acetonic solution of silver nitrate-alcoholic sodium hydroxide[6] used as spray reagent.

Identification of polyalcohols: Carbohydrate (1 g) was oxidized by Smith degradation[7] with sodium metaperiodate (0.125 M, 25 mL) at 4–6°C, 30 h and ethylene glycol (5 mL), dialyzed and concentrated. Solution was reduced by sodium borohydride[8] (1 gm, 4 h) and excess of reductant was decomposed by glacial acetic acid (5 mL) and again dialyzed. Resultant was concentrated to syrup which was hydrolyzed by H_2SO_4 (1 N, 100 mL) on water-bath (12 h). Hydrolyzate was neutralized ($BaCO_3$), filtered and deionized by Amberlite ion exchange resins[9] IR-120 (H^+) and IR-45 (OH^-), then concentrated to syrup. Paper chromatography of syrup in solvent (A) and (R_1) used as spray reagent to reveal two spots corresponding to glycerol and erythritol in 0.81 : 2.56 moles. Syrup was resolved into its components on Whatman No. 3 mm paper in solvent (B), sugar strips were cut out with the help of guide spots and eluted with water,[10] which on evaporation gave glycerol and erythritol.

Glycerol: Syrup (250 mg) was dissolved in ethanol (5 mL), filtered and concentrated to syrup, on paper chromatogram; it moved single spot parallel to authentic sample of glycerol. Residue was dispersed in pyridine (5 mL) and *p*-nitrobenzoyl chloride (3 g), heated (70°C, 45 min), cooled and sodium bicarbonate solution added, filtered, giving crystals of glycerol-tri-O-*p*-notrobenzoate by filtration. On recrystallization with acetone it had m.p. and m.m.p 187–189°C (186–188°C).[11]

Erythritol: Syrup (350 mg) was treated with animal charcoal (24 h), filtered and filtrate concentrated to syrup, then dissolved in ethanol (5 mL). It was crystallized on cooling, filtered and on recrystallization with ethanol, had m.p. and m.m.p. 120–121°C (120–122°C).[12]

Derivative was prepared by dissolving erythritol (260 mg) in anhydrous pyridine (4 mL) and *p*-toluene sulphonyl chloride (1.5 g) at room temperature for

24 h add ice cold water (20 mL) was added; on cooling crystals were obtained and dried which on recrystallization with acetone and ethanol gave tetra-O-tosyl erythritol having m.p. and m.m.p. 164–166°C (165–168°C).[12]

Hydrolysis of polyalcohols was quantitatively conducted by chromotropic acid method[13] and separated by paper chromatography on Whatman No. 3mm paper, producing glycerol and erythritol in 0.81 : 2.56 molar ratio. Colour intensity and absorbance was read at 530 mμ in photoelectrocolorimeter and results are given in Table-1.

TABLE-1
ABSORBANCE OF POLYALCOHOLS OF *CASSIA ALATA* LINN SEEDS

S. No	Amount in microgram		Klett reading (Absorbance)	
	Glycerol	Erythritol	Glycerol	Erythritol
1	2.0	2.0	22	17
2	4.0	4.0	45	31
3	6.0	6.0	64	50
4	8.0	8.0	87	63
5	10.0	10.0	108	81

Periodate oxidized carbohydrate of *Cassia alata* Linn. seeds on reduction with sodium borohydride followed by acid hydrolysis (H_2SO_4) yielded glycerol and erythritol in 0.81 : 2.56 moles. Large proportion of erythritol released with acid hydrolysis of polyalcohols produced by sodium borohydride serves as evidence that the main polymer linkages are of (1 → 4)-β-type. Ratio of erythritol to the amount of glycerol indicated a branching point on the average of fourth unit in backbone of the biochemical structure.

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