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NOTE

Chemical Study of Mucilage Obtained from Medicinal Plant *Cassia rengifera*

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A water-soluble and non-ionic D-galactomannan has been isolated from the seeds of *C. rengifera* of Indian origin, containing D-galactose and D-mannose in 3:7 molar ratio. Acid catalyzed fragmentation, periodate oxidation, methylation and enzymic hydrolysis showed that the mucilage has a branched structure consisting of a linear chain of β-D-(1→4) linked mannopyranosy units, some of which are substituted at 1→6 by α-D-galactopyranosyl units, glycosidically. This galactomannan have similarity with ghee guar plants.

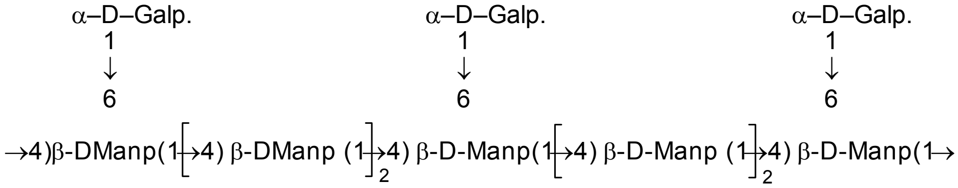
Key Words: Oligosaccharides, Mucilage, *Cassia rengifera*.

A water soluble and non-ionic D-galactomann has been isolated from the seed of *Cassia rengifera* of Indian origin[1]. Polysaccharide was conveniently extracted from the crushed, defatted and decolourized seeds by extracting with 1 % aqueous acetic acid and by repeated precipitation[2] from its solution therein with ethanol. It was purified and tested for homogeneity by usual methods. The white amorphous polysaccharide had $[\alpha]_D^{25} + 68^o$ (in water), an ash content[3] of (0.3 %) and a negligible percentage of methoxy, acetyl and uronic acid contents.

After complete acid-hydrolysis the polysaccharide yielded (D-galactose and D-mannose in 3:7 molar ratio). Graded acid hydrolysis resulted in the preferential removal of α-linked D-galactose units[4] on the periphery as end groups. To determine the position of linkages between the building units of the galactomannan[5], it was exhaustively methylated by Haworth-Purdie method[6,7], to afford a brown, semisolid glassy mass and had $[\alpha]_D^{25} + 41^o$ (chloroform). Hydrolysis of the methylated seed-gum gave 2,3,4,6-tetra-O-methyl-D-galactose[8] (3 mol), 2,3,6-tri-O-methyl-D-mannose[9] (4 mol) and 2,3-di-O-methyl-D mannose[10] (3 mol).

The identity of these methylated monosaccharides[11] was established on the basis of their R_{TMG} values, optical rotations and crystalline derivatives. The percentage of end groups calculated from methylation studies was 29.9 %. Oxidation of the mucilage with sodium metaperiodate consumed 845 mM of the oxidant with the liberation of 183 mM of formic acid per 100 g of the polysaccharide indicating 29.5 % end-groups (*cf.* methylation).

Acid catalyzed partial hydrolysis of the mucilage gave, two disaccharides: α-D-Galp (1→6)-D-Manp, β-D-Manp (1→4)-D-Manp[12] and two trisaccharides α-D-Galp (1→6)-β-D-Manp (1→4)-D-Manp[13] and β-D-Manp (1→4)-β-D-Manp along with the component sugars. All of the oligosaccharides were characterized. These results corroborated the earlier findings. The foregoing data accord with the following structure.



$$\rightarrow 4)\overset{\begin{array}{c}\alpha\text{–D–Galp.}\\ 1\\ \downarrow\\ 6\end{array}}{\beta\text{-DManp}}(1\rightarrow 4)\left[\beta\text{-DManp}\,(1\rightarrow 4)\right]_2\overset{\begin{array}{c}\alpha\text{–D–Galp.}\\ 1\\ \downarrow\\ 6\end{array}}{\beta\text{-D-Manp}}(1\rightarrow 4)\left[\beta\text{-D-Manp}\,(1\rightarrow 4)\right]_2\overset{\begin{array}{c}\alpha\text{–D–Galp.}\\ 1\\ \downarrow\\ 6\end{array}}{\beta\text{-D-Manp}}(1\rightarrow$$

Paper chromatography[14] was conducted on Whatmann filter paper no. 1 and 3 mm papers by deccending technique using the following systems (v/v). A-1-butanol-ethanol-water (5:1:4), B-1-butanol-isopropanol-water[15] (11:6:3), C-ethylacetate-pyridine-water (2:1:2).

Solution were concentrated at diminished pressure and at low temperature. All residues were dried *in vaccuo* over anhydrous $CaCl_2$, melting points are uncorrected and $[\alpha]_D$ values are for equilibria.

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