Chemistry of Natural Compounds, Vol. 35, No. 5, 1999

BRIEF COMMUNICATION

GALACTOMANNAN FROM *Gleditsia texana* SEEDS

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UDC. 547.917

We have previously reported [1] that the shell of *Gleditsia texana* seeds contains 23.7% water-soluble polysaccharides (WSPS), mainly galactomannan. The isolated polysaccharide is a white amorphous powder that dissolves in water to give a viscous gel (η_{char} = 9.87), specific rotation $[\alpha]_D^{20}$ = +14° (*c* 0.1; H_2O). Sedimentation analysis indicates that the starting galactomannan was polydisperse.

Fractionation of a 0.25% aqueous solution of WSPS by alcohol gave three fractions (Table 1). The polysaccharide fractions consist of galactomannans that differ in the ratio of mannose units, viscosity, and degree of polymerization (DP). The quantitative content of fraction I was the greatest (88.5%). The sedimenogram showed that it was homogeneous. Therefore, fraction I was further investigated chemically.

The configuration of the glycoside bond was determined by oxidizing the fully acetylated galactomannan with CrO_3. The detection of only galactose confirms that the glycoside of this component has the α-configuration.

The bonding type of the monomers and the size of the heterocyclic ring were determined by Smith degradation. The hydrolysate of oxidation products contained erythrit and glycerin in an 11.3:3.4 ratio according to paper chromatography (PC) and GLC. A total of 1.05 moles of periodate released 0.28 moles of formic acid. The appearance of erythrit indicates that the mannose and galactomannan residues are 1→4 bonded.

Methylation of fraction I according to the literature method [2] produced the permethylate. According to TLC, it consists of 2,3-di-O-methyl-*D*-mannose and 2,3,6-tri-O-methyl-*D*-mannose, 2,3,4,6-tetra-O-methyl-*D*-mannose, and 2,3,4,6-tetra-O-methyl-*D*-galactose with R_f values of 0.17, 0.53, 0.84, and 1.0, respectively, in the ratio 3.2:22.0:1.0:6.7.

The presence of 2,3,6-tri-O-methyl-*D*-mannose confirms that the mannopyranose units are linked by a 1→4 glycoside bond. The detection of 2,3-di-O-methyl-*D*-mannose indicates that the structure is branched with a galactomannan side chain containing a galactose bonded to a C-6 mannose.

The sequence of sugar units in the macromolecule was studied by partial acid hydrolysis (0.25 M CF_3COOH, 3 h). Free galactose, mannose, and four oligosaccharides (A-D) with R_f values 0.72 (A), 0.56 (B), 0.27 (C), and 0.08 (D) were identified by PC using butanol-pyridine-water (6:4:3).

Acid hydrolysis of the oligosaccharides and their reduction products ($NaBH_4$) showed that oligosaccharide A is mannobiose; B, galactosylmannose; C, mannotriose; D, mannotetraose.

The galactomannan from *G. texana* seeds differs from that from *Gleditsia* sp. that was studied earlier [3-5] in the ratio of monomers, DP, molecular mass (MM), and the degree of substitution in the β-*D*-mannan main chain by *D*-galactose units.

TABLE 1. Polysaccharide Fractionation

Fraction No.	Yield, %	Gal:Man ratio	η_{rel} (*c* 0.5; H_2O)	MM	DP
I	88.5	1:3.83	139.4	795000	4907
II	5.4	1:2.35	51.7	57000	352
III	1.0	-		-	

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 0009-3130/99/3505-0580$22.00

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