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Isolation, characterization and molecular size distribution of galactomannans from *Prosopisaffinis* seeds endosperm

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Abstract

Galactomannans are valuable water-soluble nonionic polysaccharides, used in the food industry. As part of our bioprospection program for the valorization of Uruguayan native woodlands we have isolated and characterized the galactomannan present in the seeds of *Prosopisaffinis* Spreng. (Leguminosae, Mimosaceae).

Mature pods from *P.affinis* were collected, dried, and the seeds were manually separated. The seeds were immersed in boiling water, then the swell endosperm was manually isolated, and extracted with water either at room temperature or at 80 °C. The galactomannans were isolated by precipitation with 3 volumes of isopropanol and dialysis (yield 64 % respects to endosperm). The polysaccharides were hydrolyzed and analyzed by TLC, showing only the presence of galactose and mannose. The mannose to galactose ratios were determined by HPLC/IR using a Shodex C-611 column as 1.4 and 1.5 for the galactomannans obtained at room temperature and 80°C, respectively.

NMR spectra were acquired on a Bruker AVANCE III 500 spectrometer, and the structures of the galactomannans were determined mainly by 1D-TOCSY and 2D-HSQC-TOCSY as linear mannans partially substituted by single galactopyranosyl residues.

The MW distributions of the galactomannans were analyzed by SEC-HPLC/MALLS/IR (Wyatt Dawn 8⁺) on an Agilent SEC-5 column showing M_w from 4.8 to 5.8 x10⁵ Da.

In short, the structure and the molecular weight distribution of the isolated galactomannans indicated that they possessed similar properties to other commercial products like guar and locus bean gums, showing promise as alternatives for the food industry.