ARABINOGALACTAN OF FERULA TENUISECTA

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From the aerial part of *Ferula tenuisecta* (fam. *Apiaceae*) isolated a water-soluble polysaccharide (WSPS) with a yield of 5%, with a monosaccharide composition of galactose, glucose, mannose, xylose, arabinose, rhamnose and uronic acids in 38:5.7:37:2.7:11.4:5.0 and 10% uronic acids [1]. GC analysis of hydrolysates was performed on a GC Plus 2010 chromatograph under the following conditions: injector temperature 250°C, total flow 60 ml/min, column flow 0.89 ml/min, carrier gas-nitrogen, column-Rxi-624SI MS, column length 3 m, internal diameter ID 0.25 mm, column temperature 230°C, detector temperature 250°C.

Fractional precipitation of WSPS with alcohol and subsequent fractionation on a DEAE-cellulose column produced a homogeneous arabinogalactan - AG-Ften.

AG-Ften is an amorphous white powder, soluble in water and has a Mm of 40 kDa according to high-performance exclusion chromatography. The molecular weight of arabinogalactan was determined by high-performance exclusion chromatography on an Agilent 1260 Infinity liquid chromatograph using a PL Aquagel OH Mixed chromatographic column (USA), 300 mm long and 8 mm with an internal diameter. The concentrations of the injected samples were 1–4 mg/ml, the volume was 20 µl. An aqueous 0.1 N sodium nitrate solution was used as an eluent. The volume velocity of the eluent flux was 0.8 ml/min. The temperature of the column and detector systems was maintained at 25°C. A differential refractometer was used as a detector. The chromatographic column was calibrated using linear narrowly dispersed polymer standards of pullulan from Showa Denko (Japan). The IR spectra of the samples were taken on a Perkin-Elmer FTIR spectrometer, model 2000, in plates pressed with KBr. The IR spectrum of AG-Ften contains absorption bands 3394 (OH group), 869 and 720 (α and β-glycosidic bonds). A monosaccharide composition was established by complete acid hydrolysis of arabinogalactan (1 n. H_2SO_4, 100°C, 8 h). The monosaccharide composition according to GC data is represented by arabinose and galactose in a ratio of 1:2.4. Methylation of AG-Ften using the Ciucanu method [2] determined the type of glycosidic bonds between monosaccharide residues. The completeness of methylation was controlled by IR spectroscopy by the absence of the absorption band of the hydroxyl group 3394 cm^{-1}. In the products of AG-Ften GC/MS permethylate hydrolysate, 2,3,4,6-tetra-O-Me-D-Gal, 2,3,4-tri-O-Me-D-Gal, 2,4,6-tri-O-Me-D-Gal, 2,3,5-tri-O-Me-L-Araf, 2,3-di-O-Me-Araf were identified. The methylation results suggest that the backbone of arabinogalactan consists of 1,3 and 1,6 bound galactopyranose residues, and the side chain is represented by 1,2 and 1,5-linked arabinofuranose residues.

Thus, a homogeneous arabinogalactan AG-Ften, which belongs to arabino-3,6-galactans, was isolated from the aerial part of Ferula tenuisecta.

Literature:

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