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CARBOHYDRATE COMPONENTS OF *Platanus orientalis*

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On the territory of Central Asia, the genus *Platanus* L., fam. Platanaceae, is represented by four species [1]. The most widespread of them is *P. orientalis* L. (oriental plane), which reaches a height of 55-60 m [2].

The chemical composition of the leaves consists of flavonoids and phenolcarboxylic acids [2-3]. There is no information in the literature on the carbohydrate components of *P. orientalis*.

The comminuted air-dry raw material (shed leaves), previously treated with chloroform, was subjected to treatment with 86% alcohol (1:1) at the boil to extract low-molecular-mass carbohydrates (LMCs). The combined extracts were evaporated to dryness, and the LMCs were obtained with a yield of 3.3% on the air-dry raw material. Paper chromatography (PC) of the LMCs (system 1: butanol—pyridine—water (6:4:3)) revealed glucose and galactose. In all cases we used FN-11,13 paper for PC. The water-soluble polysaccharides (WSPSs) were extracted by the usual method [4].

The extract was evaporated in vacuum, freed from proteins by Sewag's method, and precipitated with ethyl alcohol (1:3). The precipitate consisted of WSPSs (6.73%). The WSPSs formed a white amorphous powder readily soluble in water and giving a negative reaction for starch with iodine.

In the product of acid hydrolysis (2 N H_2SO_4, 48 h), glucose, galactose, and xylose were detected by PC.

Pectin substances (PcSs) were obtained by subsequent extraction with a 0.5% solution of oxalic acid at 70°C twice for 2 h each time. The combined extracts were dialyzed against distilled water and evaporated in vacuum in a rotary evaporator, and the viscous syrup was precipitated with alcohol.

After drying, the precipitate of pectin substances (3.3%) formed a cream-colored powder giving a colloidal solution in water.

The molecular mass of the pectin, determined by sedimentation analysis (speed 50,000 r.p.m., temperature 20°C, angle 48°, time 3 h 15 min) was 68,100 [5].

Titrimetric analysis of the plane tree pectin showed that it was a product with an average degree of esterification, $\lambda = 50.0$. Percentage of free carboxy groups, $K_f = 3.0$; percentage of methoxylated groups $K_m = 3.0$; galacturonic acid content 24.1%.

A sample of the pectin was hydrolyzed with 2 N H_2SO_4 for 60 h, followed by neutralization with barium carbonate and deionization with KU-4 cation-exchanger (H^+). In the hydrolyzate of the PcSs the presence of glucose, galactose, arabinose, xylose, and galacturonic acid was shown by PC.

The partial acid hydrolysis of the pectin with 2 N H_2SO_4 for 4 h gave the corresponding galacturonan, consisting only of galacturonic acid, which was found by PC (system 1) in the product of its complete acid hydrolysis.

Thus, the monosacharide compositions of the PcSs and of the galacturonan, the titrimetric results, and the specific rotation of an aqueous solution of the pectin, $[\alpha]_D^{25}$ +150° (*c* 0.25; H_2O), permitted the assumption that the pectin substances of the plane tree consist basically of galacturonic acid residues linked by α-glycosidic bonds. Triplets of pyranose rings (815, 870, 910 cm^{-1}) in the IR spectrum of the PcSs likewise confirmed the presence of α-1→4 glycosidic bonds between the galacturonic acid residues [7].

Consequently, shed plane leaves may serve as an additional source of water-soluble polysaccharides and pectin substances.

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