

BRIEF COMMUNICATIONS

INVESTIGATION OF THE CARBOHYDRATES OF *Saccharum spontaneum* AND *Arundo donax*

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The carbohydrate components of the sugarcane, which is cultivated in several countries, and of the waste material from it have been studied in fairly great detail [1, 2]. Thus, it has been established that the xylans of *Phragmitis communis* and *Arundo donax* L. belong to the glucuronoaraboxylans [3-5].

We have studied the carbohydrate content of two representatives of the family Gramineae: *Saccharum spontaneum* L., growing in the Surkhandar'ya oblast and *A. donax* collected on April 15, 1972, in the early vegetation period (length 15 cm) along the R. Kafirnigan (Tadzhik SSR). In each sample we determined successively the amount of reducing substances (RSs), water-soluble polysaccharides (WSPSs), pectin substances (PSs), hemicelluloses A and B, and cellulose (Table 1). Fructosans were present only in the tips of the stems (0.2%) and the stems (0.43%).

By paper-chromatographic analysis, the RSs from the stems, roots, and bagasse were found to include sucrose, mannose (I), and glucose (II), while in the tips of the stems and the leaves mannose was absent. The purified WSPSs consisted of a white amorphous powder giving a red coloration with iodine and yielding, on complete acid hydrolysis, mannose (I), arabinose (III), and galactose (IV). A hydrolyzate of the pectin substances was found to contain (III), (IV), and galacturonic acid (V). Hemicellulose A consisted of (II) and (III), and hemicellulose B of (II) and xylose (VI).

The results of a study of the carbohydrate components of *A. donax* showed that the water-soluble polysaccharides and the pectin substances contained (III), (IV), and (V), the hemicellulose A contained (IV) and (V), and the hemicellulose B contained (III), (IV), and (V).

Thus, the monosaccharide composition of the xylans of the plant species investigated is similar to that of polysaccharides of other representatives of the family Gramineae. The high content of pentosans and hexosans in the plants show that they can be used as a raw material for the hydrolysis industry.

TABLE 1. Carbohydrate Contents (% on the air-dry raw material)

Plant and its organs	RSs		Polysaccharides				
	before inversion	after inversion	WSPSs	PSs	hemicellulose		cellulose
					A	B	
<i>S. spontaneum</i>							
Tips of the stems	0,87	2,56	0,40	0,24	5,2	14,5	26,8
Stems	14,16	21,69	1,06	0,13	11,0	4,2	15,0
Leaves	0,57	0,79	0,15	0,13	10,4	8,1	21,9
Roots	5,64	12,18	0,30	0,22	9,0	5,0	19,2
Bagasse	5,18	6,60	0,80	—	7,5	11,9	22,5
<i>A. donax</i>	2,54	0,72	0,66	0,40	3,0	15,8	6,1

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