

INVESTIGATION OF THE CARBOHYDRATES  
OF *Arum korolkovii*

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The genus *Arum* (family Araceae) is represented in the USSR by five species [1]. The carbohydrates of plants of this genus have scarcely been studied. There is only information of the presence of starch in the tubers of *A. korolkovii* Rgl. [2]. We have investigated the carbohydrates of *A. korolkovii* collected on July 24, 1972, on the right bank of the R. Ugam in the period of green fruit. The comminuted air-dry raw material was defatted with petroleum ether (40-70°C) and then, to inactivate the enzymes, it was boiled with 96% ethanol. The free sugars were extracted with 82% ethanol. They were found by chromatography (system 1) to contain sucrose, glucose, and mannose. The amounts of reducing substances in the extract before and after inversion were found by Bertrand's method (Table 1).

The following solvents systems were used for chromatography: for descending PC, 1) butan-1-ol-acetic acid-water (4:1:5); 2) butan-1-ol-ethanol-trichloroethylene (6:2:2); for TLC on silica gel G impregnated with a 0.3 M solution of sodium dihydrogen phosphate, the butan-1-ol-ethanol-0.1 N HCl (1:10:5) system; the chromogenic agents were aniline phthalate and o-toluidine-salicylic acid.

The residue of the raw material was treated with water, and the protein substances were eliminated from the extracted water-soluble polysaccharide. After purification through the copper complex, a white amorphous powder giving a red color with iodine was obtained.

On ultracentrifugation of a 0.36% solution of the polysaccharide in 15% NaOH on an MOM-3170 apparatus (1.5 h, 50,000 rpm), a single peak was found; on the basis of the sedimentation rate its molecular weight was determined as approximately 28,000. An analysis of the polysaccharide showed that it contained no nitrogen, methoxy groups, or ash. In the products of the complete acid hydrolysis of the polysaccharide with 1 N H<sub>2</sub>SO<sub>4</sub>, glucose, and mannose were identified chromatographically (systems 1 and 2). Consequently, the polysaccharide is a glucomannan.

The residue of the raw material was extracted with a mixture of 0.5% aqueous solutions of oxalic acid and of ammonium oxalate [3]. This gave a light-brown amorphous powder, which was subjected to acid hydrolysis. Barium salts of the polyuronides were precipitated from the hydrolyzate with ethanol, and these were again hydrolyzed and were treated with KU-2 cation-exchange resin. Chromatography of the hydrolyzates (systems 1-3) showed the spots of galactose, mannose, arabinose, xylose, and galacturonic acid. Consequently, this polysaccharide belongs to the group of pectin substances.

TABLE 1. Amounts of Carbohydrates in *A. korolkovii* (% on the Weight of the Air-Dry Raw Material)

Plant organ	Reducing substances		Polysaccharides		
	before inversion	after inversion	water-soluble	pectin substance	fructosans
Stems	5.59	2.24	1.03	8.0	2.5
Tubers	2.6	4.18	10.9	10.8	0.6

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The stems yielded on similar treatment water-soluble polysaccharides giving on hydrolysis glucose and mannose, and pectin substances in a hydrolyzate of which glucose, mannose, and galacturonic acid were found.

#### LITERATURE CITED

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