CARBOHYDRATES OF *Diospyros kaki*

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The fruit of *Diospyros kaki* L. (Japanese persimmon) is not only a source of polyvitamins but also contains a considerable amount of carbohydrates, mainly glucose and fructose, which are readily assimilated by the organism. However, there is no information in the literature on the carbohydrate composition of the persimmon regionalized in the Azerbaidzhan SSR.

The isolation and fractionation of the carbohydrates was performed by published methods [1-3], using paper and thin-layer chromatography [4, 5]. The carbohydrates were determined quantitatively by the ferrocyanide method [6]. Below we give the ethanol-soluble polysaccharides [sic] in the persimmon (% of the total weight).

Chromatographic analysis of the ethanol-soluble (ESPs), water-soluble (WSPs), and water-insoluble (WISPs) polysaccharides and also of the hemicelluloses A and B of four varieties of persimmon showed the following sugars (% on the total weight):

Variety	Reducing sugars	Total sugars	Monosaccharides	Sucrose
Kachia	13.2	16.0	9.34	2.6
Khiakme	16.0	17.0	13.0	0.95
Zendzhi-Maru	16.2	17.6	12.2	1.3
Emon	14.4	15.2	11.3	0.76

Chromatographic analysis of the ethanol-soluble (ESPs), water-soluble (WSPs), and water-insoluble (WISPs) polysaccharides and also of the hemicelluloses A and B of four varieties of persimmon showed the following sugars (% on the total weight):

ESPs — maltose (0.17-0.8), glucose (4.8-6.2), fructose (3.8-5.9) ribose (2.0-2.2), and rhamnose (1.6-2.03);

WSPs — uronic acids (0.23-0.34), galactose (0.04-0.56), glucose (0.02-0.08), rhamnose (0.04-1.04);

WISPs — uronic acids (0.094-0.224) galactose (0.07-0.184);

Hemicellulose A — uronic acids (0.47-1.04), galactose (0.12-0.34), arabinose (0.15-0.44), an unidentified sugar (0.1-0.26); and

Hemicellulose B — uronic acids (0.35-0.74), galactose (0.34-1.58), arabinose (0.29-0.41), xylose (0.23-0.65), an unidentified sugar (0.04-0.90).

The residue after fractionation consisted of (% on the total weight) α-cellulose (0.40-0.72) and lignin and mineral matter (1.12-1.94).

As can be seen from the results obtained, the persimmon contains pentoses, hexoses, disaccharides, and deoxysugars. In the fraction of ethanol-soluble polysaccharides there is a large amount of sugars represented mainly by glucose and fructose. It must be mentioned that the carbohydrate composition is practically independent of the variety of the fruit and the varieties investigated can be used successfully for obtaining fruit preserves for infant and dietitic nutrition.

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POLYSACCHARIDES OF *Bunium persicum*

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We have previously reported on an investigation of the oil and carbohydrates from the seeds of *Bunium persicum* (Boiss.) K.-Poll. [1].

We now give results of the study of the polysaccharides in the roots and stems of the plants collected in the Hissar range (Uzbek SSR) in the periods of flowering and fruit-bearing.

The polysaccharides were isolated from one sample of raw material in the following sequence: first the water-soluble polysaccharides (WSPs), then the pectin substances (PSs), and the hemicelluloses (HMCs) (%):

Phase of development	Plan organ	VSPSs	PSs	HMCs
Flowering	Stem	1.2	6.6	2.9
	Roots	1.6	13.8	4.8
Fruit-bearing	Stem	0.6	10.75	14.7
	Roots	11.29	12.54	16.3

Most of the polysaccharides were present in the roots. In the flowering phase the pectin substances and in the fruit-bearing phase hemicelluloses predominated.

To determine the qualitative and quantitative compositions of the carbohydrates, the polysaccharide fractions (isolated in the fruit-bearing phase) were subjected to complete acid hydrolysis (2 N H_2SO_4, 100°C, 24 h), and the sugars in the hydrolysate were investigated by PC and GLC [2]. The relative amounts of monosaccharides are given below:

Plant organ	Polysaccharide	*Gal*	*Glc*	*Man*	*Xyl*	*Ara*	*Rha*	*GalUA*
Stems	NSPSS	1.2	—	1.7	1.6	1.5	1.0	—
	PSS	2.0	1.2	Tr.	1	4.3	8.1	+
	HMCS	1.3	4.7	1	16.8	1.4	2.8	+
Roots	NSPSS	3.4	11	1	1	1.4	2.8	—
	PSS	1	1	Tr.	2.1	1	19.2	+
	HMCS	1.4	6.7	1	30.2	2.8	2.4	+

In contrast to the seeds [1], in the stems and roots, of neutral sugars rhamnose predominated in the pectin substances and xylose in the hemicelluloses.

The pectin substances of the stems consisted of fibrous material soluble in water giving 1.0 and 0.5% aqueous solutions having relative viscosities of 4.0 and 2.2, respectively. They gave no starch reaction with iodine.

Thus, the polysaccharides of the stems and roots of *Bunium persicum* are represented by biopolymers of various natures: water-soluble polysaccharides, pectin substances, and hemicelluloses.

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