

POLYSACCHARIDES OF THE FRUIT OF *Punica granatum*R. Normakhmatov,¹ R. K. Rakhmanberdiyeva,¹
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The single species *Punica granatum* (common pomegranate) grows in the Republic of Uzbekistan [1], and its several varieties are widely cultivated. The pectin substances (PcSs) of the pomegranate have been studied previously [2]. Continuing the investigation, we have analyzed the polysaccharides of the cultivated variety Kozake from various growth sites. We used pomegranate peel and seeds. The PSs were isolated [3] successively from one sample of raw material: the water-soluble polysaccharides (WSPSs), the PcSs, and the hemicelluloses (HC). Their compositions were determined after acid hydrolysis with the aid of PC and the GLC of their aldonitrile acetate derivatives [3]. The amounts of the PSs and their monosaccharide compositions are given in Table 1.

It was found that the pomegranate peel and seeds contained a fairly large level of WSPSs (from 4.5 to 5.5%). The main monosaccharides in the WSPSs from the peel, varying with the growth site, were xylose, glucose, and galactose, while in the hydrolysis products of the seeds WSPSs the main monosaccharide was galactose. The PSs were distributed nonuniformly in the different parts of the fruit: there was more of them (2.9—4.0%) in the peel than in the seeds (1.5%).

The amount of PcSs was greatest (4.0%) in the peel of a pomegranate from Dashnabad. The main monosaccharides of the PcSs were galactose and glucose.

Relatively large amounts of xylose, arabinose, and galactose were present in the peel of other varieties of pomegranate, depending on the growth site. The predominating component of the HCs of pomegranate peel (Fergana) was rhamnose.

Thus, a quantitative determination of the polysaccharides of *Punica granatum* fruit has shown that the peel is rich in WSPSs and PcSs.

TABLE 1

Growth site and plant organ	Type of polysaccharide	Yield of PSs, %	Quantitative ratio of the sugar residues						
			Rham	Ara	Xyl	Man	Glc	Gal	GalUa
Shirobal, peel	WSPSs	4.5	Tr.	3.4	2.3	1.0	24	13.8	
	PcS	3.7	1.0	7.0	8.6	1.0	Tr.	2.6	+
	HCS	1.7	3.5	1.8	1.0	1.0	4.4	4.0	+
Dashnabal, peel	WSPSs	4.0	1.0	1.0	27	-	1.6	4.6	
	PcS	4.0	2.0	3.4	1.0	-	6.0	9.0	+
	HCS	1.1	1.0	-	-	-	3.0	6.6	+
Fergana, peel	WSPSs	5.1	1.0	2.7	6.2	Tr.	2.0	25	
	PcS	2.9	1.0	13.7	6.0	1.0	-	1.0	+
	HCS	1.3	9.0	3.2	1.0	4.0	Tr.	Tr.	+
Shirobal, seeds	WSPSs	5.5	2.0	2.5	1.0	-	3.0	6.6	
	PcS	1.5	1.0	1.8	1.5	-	1.0	1.0	+
	HCS	1.8	3.7	1.5	2.0	Tr.	1.2	1.0	+

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REFERENCES

1. *Flora of Uzbekistan* [in Russian], Tashkent, Vol. 4 (1959), p. 239.
2. N. P. Yuldasheva, D. A. Rakhimov, and Z. F. Ismailov, *Khim. Prir. Soedin.*, 393 (1978).
3. R. Normakhmatov, M. Kh. Malikova, A. O. Arifkhodzhaev, and D. A. Rakhimov, *Khim. Prir. Soedin.* 116 (1999) [preceding paper in this issue].