WATER-SOLUBLE POLYSACCHARIDES FROM INFLORESCENCES OF Amelanchier ovalis

E. G. Martynov and E. A. Stroev

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Continuing an investigation of the carbohydrates of Amelanchier ovalis Medic (garden serviceberry) [1], we have studied the dynamics of the accumulation of the water-soluble polysaccharides (WSPSs) of inflorescences of this plant and their monosaccharide composition.

The WSPSs were extracted from the air-dry material (moisture content 8-10%, collected in the environs of Ryazan', village of Mervino) with water, and they were then demineralized, their ash content being determined as in [1] and the amount of uronic anhydride by the method of complexonometric titration [2]. The ash content of the demineralized polysaccharides (PSs) was 0.4-0.6%. Hydrolysis of the PSs and the subsequent operations with them were carried out as described previously [3, 4]. The hydrolysates were investigated by the PC method in the butan-1-ol—pyridine—water (6:4:3) system. The neutral sugars were revealed with aniline phthalate with heating at 105-110°C for 10 min. The results of the investigation of the WSPSs of the inflorescences of the garden serviceberry are given in Table 1.

TABLE 1

Phase of development	Yield of WSPSs	Ash content	Amount of monosaccharides, % of the total, taken as 100%					Gal UA, %
	%		Gal	Glc	Ara	Xyl	Rha	
Beginning of flowering	3,1	18,2	34,4	9,3	45,3	4,4	6,6	85,2
Mass flowering	4,5	19,0	39,3	10,1	42,6	3,2	4,8	86,7
End of flowering	2,1	17,2	36,5	9,1	42,1	3,0	9,3	86,1

It was established that the WSPSs of the inflorescences of the garden serviceberry consists of eight monosaccharide components — D-galacturonic acid, D-galactose, D-glucose, L-arabinose, D-xylose, and L-rhamnose — and two unidentified monosaccharides chromatographically more mobile than D-xylose and L-rhamnose.

The amounts of the neutral monosaccharides were determined as described previously [4].

As we see, in ontogenesis, the PSs are distributed nonuniformly in the inflorescences: Their accumulation is greater in the period of mass flowering and smaller in the end-of-flowering phase.

No appreciable differences were detected in the amounts of ash and galacturonic acid in the WSPSs. The predominating components of the PSs of the inflorescences of all the stages of ontogenesis were arabinose and galactose, their amounts changing quantitatively up to the period of the end of flowering by similar degrees (by a factor of 1.1), the former decreasing and the latter increasing in comparison with the beginning-of-flowering phase.

The amount of rhamnose in the PCs also increased (by a factor of 1.4); in the period of mass flowering, its amount, conversely, decreased by the same factor. The amount of xylose decreased somewhat more (by a factor of 1.5), while the level of glucoses at the end of ontogenesis remained practically unchanged although its amount in the mass flowering phase, just like the amount of galactose, rose by a factor of 1.1.

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POLYSACCHARIDES OF *Eremurus*.

XXIII. CARBOHYDRATES FROM LEAVES OF SOME SPECIES OF *Eremurus*

N. P. Yuldasheva and D. A. Rakhimov

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We have previously characterized the pectin substances (PSs) of the leaves of a number of species of plants of the genus Eremurus [1, 2]. Continuing a study of Eremurus polysaccharides, we have investigated the water-soluble polysaccharides (WSPSs), the glucofructans (GFs), and the hemicelluloses (HCs).

TABLE 1

Plant	Type of carbohydrate	Yield of PSs, %	Ratio of the monosaccharides					
			Rham	Ara	Xyl	Man	Glc	Gal
E. anisopterus (K. et. K.). Rgl	WSPSs	2,42	27	18	16	1	18	49
	HCs A	1,22	17	18,3	21,7	2,6	7,5	1
	HCs B	0,8	27,5	32	13,9	1	64	44
E. comosus O. Fedtsch.	WSPSs	2,18	3,3	2,8	1	1,5	5,3	6,4
	HCs A	0,4	1,88	6,33	7,2	2,2	9,8	1
	HCs B	1,5	1,5	2,59	1,5	1	6,4	1,11
E. korovinii B. Fedtsch.	WSPSs	2,6	1,09	1,11	1,17	1	2,7	2
	HCs A	0,36	7,5	8,39	3,5	1,98	7,1	1
	HCs B	1,82	3,9	3,81	1,6	1	1,2	1
E. lactiflorus O. Fedtsch	WSPSs	4,72	13,5	8,7	5,7	1	4	2,7
	HCs A	0,26	2,3	3,35	4,35	1,3	14,1	1
	HCs B	2,8	1,5	1,38	1	1,57	2,8	1,57
E. luteus Baker	WSPSs	3,98	5,77	2,84	1,2	1	1,88	5,77
	HCs A	1,16	1	7,1	7,7	4	1,3	1,7
	HCs B	1,56	3,71	3,46	1,71	1	2	1,7
E. olgae Rgl	WSPSs	5,46	5,6	3,5	2,86	2,16	1	2,4
	HCs A	0,5	50	42,5	62	13,1	23,1	1
	HCs B	2,36	4,6	41,3	35,5	9,55	8,8	1
E. regelii Vved.	WSPSs	6,96	8,57	5,94	3,7	1,14	3,25	1
	HCs A	0,26	1,23	1,18	1,7	1,55	3,93	1
	HCs B	2,45	9,2	5,13	3,2	1,63	1,6	1
E. robustus Rgl	WSPSs	2,92	17	17,3	6	1	3,5	6
	HCs A	0,24	1,3	1	1,46	2,4	1,3	5,1
	HCs B	2,4	72,8	47,3	32,4	7,2	2,6	1
E. roseolus Vved.	WSPSs	6,28	6,1	4,4	6,75	1	10	2
	HCs A	0,4	5,6	2,88	8,13	1	7,8	2,64
	HCs B	2,9	3,2	1,6	1	1,05	2,9	1,2
E. sogdianus (Rgl) Benth et Hook	WSPSs	2,96	2,81	4,4	1	3,46	5,6	7,3
	HCs A	0,13	2,18	1	1	1,47	2,12	Сл.
	HCs B	0,82	1,6	21	16,3	6,4	4,6	1
E. baussunensis O. Fedtsch	WSPSs	4,4	1,45	1,7	1,75	Сл.	Сл.	1
	HCs A	1,4	1,8	4,2	1	Сл.	Сл.	2
	HCs B	3,4	Сл.	9,7	2,3	Сл.	Сл.	1

The polysaccharides were isolated successively from a single sample of the air-dry material: first the WSPSs, then the GFs and the HCs (after the isolation of the pectin).

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