WATER-SOLUBLE POLYSACCHARIDES OF THE LEAVES OF *Amelanchier ovalis*

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Continuing investigations of the carbohydrates of plants of the family Rosaceae [1, 2], we have studied the dynamics of the accumulation and the monosaccharide composition of water-soluble polysaccharides (WSPSs) of the leaves of *Amelanchier ovalis* Medic (garden serviceberry).

The comminuted air-dry raw material (moisture content 8.9-9.0%) collected in the environs of Ryazan' (village of Mervino) in 1979-1981, which had previously been purified with ethanol (1:10), was extracted with hot water at 90-95°C (1:20) for 1.5 h. The extract was filtered and evaporated, and the residue was treated with 96% ethanol (1.5 volumes). The precipitate of polysaccharides (PSs) was separated off, washed with ethanol and acetone, and dried in a vacuum over P_2O_5.

The ash content was determined by incinerating samples of the PSs in a muffle furnace at 600°C. The demineralization of the WSPSs was carried out by reprecipitating them from aqueous solution with ethanol and by treatment with KU-2 cation-exchanger (H^+ form). The ash content of the demineralized PSs was 0.6%. The amount of uronic anhydride was determined by the method of complexonometric titration [3]. The hydrolysis of the demineralized PSs the neutralization of the hydrolysates, and other operations with them were carried out as described previously [4]. The hydrolysates obtained were investigated by PC in the 1-butan-ol—pyridine—water (6:4:3) system. Neutral sugars were revealed by the action of aniline phthalate at 105-110°C for 10 min.

It was established that the WSPSs of the leaves of the garden serviceberry consisted of eight monosaccharides: 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 relative amounts of galactose, glucose, arabinose, xylose, and rhamnose were determined as described in [4].

Below we give the results of an investigation of the WSPSs of the leaves of the garden serviceberry (%):

Phase of development	Yield of WSPSs	Ash content	Proportion of monosaccharides of the sum taken as 100%					
			Gal	*Glc*	*Ara*	*Xyl*	*Rha*	*Gal UA*
Mass flowering	3,6	18,7	35,8	4,3	31,4	3,7	24,8	66,7
Green fruit	4,7	17,7	42,7	7,6	20,6	3,7	25,4	63,4
Ripe fruit	7,1	17,8	43,4	9,7	6,2	2,8	37,9	62,8
Mass leaf fall	7,7	19,5	43,7	9,7	6,0	2,7	37,9	61,9

As we see, in ontogenesis the accumulation of PSs in the leaves rises: their greatest amount accumulates in the period of mass leaf fall and their smallest amount in the phase of mass flowering

No substantial differences were observed with respect to the amount of ash and of galacturonic acid in the WSPSs. The predominating component of the PSs of the leaves was galactose, the amount of which rose 1.2-fold by the period of mass leaf fall in comparison with the phase of mass flowering. Rhamnose (1.5-fold) and glucose (2.3-fold) accumulated to a somewhat greater degree. The amounts of arabinose and xylose in the PSs fell (5.2- and 1.4-fold, respectively), although the level of the latter, just like the amounts of all the other sugars, remained practically unchanged at the end of ontogenesis. The results obtained permit the WSPSs of the leaves of the garden serviceberry to be assigned to the class of pectin substances. The study of the PSs of the garden serviceberry is continuing.

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LITERATURE CITED

1. A. I. Yakovlev and E. G. Martynov, Khim. Prir. Soedin., 85 (1979).
2. E. G. Martynov, Khim. Prir. Soedin., 241 (1981).
3. Z. K. Karakeeva, R. Sh. Abaeva, and G. B. Aimukhamedova, Izv. Akad. Nauk KirgSSR, No. 1, 57 (1976).
4. E. G. Martynov and D. D. Peskov, Khim. Prir. Soedin., 524 (1983).

FRACTIONATION OF THE PECTIN SUBSTANCES OF *Eremurus regelii*. XXII.

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We have previously studied the structure of a galacturonan isolated by partial acid hydrolysis of the pectin substances (PSs) from the leaves of *Eremurus regelii* Vved. In the present communication we give the result of an investigation of homogeneous fractions isolated from the PSs.

The pectin substances from the leaves of *E. regelii* were polydisperse in gel chromatography on Sephadex G-100. To obtain homogeneous fractions of the PSs, alkaline saponification was carried out with caustic soda (0.15 g/100 ml) at room temperature for 18 h. After neutralization with 18% of HCl solution, a gel-like precipitate deposited which was washed with 80% and 96% methanols and formed fraction (I) (yield 65%). The mother solution was dialyzed, concentrated, and precipitated with methanol (1:2) giving 6% of fraction (II). The characteristics of the fractions obtained by alkaline saponification are given below:

Fraction	$[\alpha]_D^{20}$, deg	Monosaccharide composition, moles						
		Rham	*Ara*	*Xyl*	*Man*	*Gal*	*Glc*	*GalUA*
I	+249 (*c* 0.25; H_2O)	14	3.7	1.3	Tr.	4.6	Tr.	+
II	+200 (*c* 0.5; H_2O)	7.5	5.8	3.7	Tr.	19.6	4.9	+

To determine the monosaccharide composition, samples were hydrolyzed with 2 N H_2SO_4 in tubes at 100°C for 48 h and were subjected to PC (1-butanol—pyridine—water (6:4:3) system; revealing agent: aniline hydrogen phthalate). The GLC of samples in the form of the acetates of the corresponding aldonitriles [1] were recorded on a Tsvet-101 instrument with a flame-ionization detector under the following conditions: steel column (200 × 0.3 cm), 5% of Silicone XE-60 on Chromaton NAW (200-250 mesh), thermostat temperature 210°C, evaporator temperature 270°C, carrier gas helium at the rate of 75 ml/min.

To obtain homogeneous fractions of pectic acid, a 1% solution of fraction (I) was treated with 1 N NaOH (4 ml) and then a 2 M solution of CH_3COONa (6 ml) was added dropwise and the mixture was left at +4°C for 18 h. The precipitate that had deposited (fraction A) was centrifuged off and was washed with 80% and 96% methanols (the yield of fraction A was 14%). The supernatant was treated with 2 M CH_3COONa solution (3 ml) and the resulting precipitate (fraction B) was separated off and washed with 80% and 96% methanols (the yield of fraction B was 3.75%). The mother solution was dialyzed, concentrated, and precipitated with methanol (1:2), giving a 40.5% yield of fraction C. The homogeneity of the fractions obtained (A, B, and C) was confirmed by gel chromatography on Sephadex G-100. Their characteristics are as follows:

*Deceased.

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