BRIEF COMMUNICATIONS

Ungernia POLYSACCHARIDES.

V. MUCILAGINOUS POLYSACCHARIDES OF *Ungernia ferganica* AND *U. sewerzowii*

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Continuing an investigation of the carbohydrates of plants of the genus *Ungernia* [1], we have studied water-soluble polysaccharides of the bulbs of *U. ferganica* Vved. and *U. sewerzowii* (Regel.) B. Fedtsch. The polysaccharides (PSs) were isolated by the method of Malikova et al. [2].

On complete acid hydrolysis of the polysaccharides, arabinose, mannose, glucose, galactose, and also traces of galacturonic acid were identified in the hydrolysates by PC and GLC.

The initial polysaccharides were separated by fractionation on a column of DEAE-cellulose (acetate form). The yield of PSs eluted by water amounted to 58 and 62% (on the initial PSs), respectively. When they were subjected to acid hydrolysis, arabinose, mannose, and glucose were detected in the ratios (GLC) of 1:96:3.1 in the case of the PSs from *U. ferganica* and 1:79:6 in the case of *U. sewerzowii*. Gel filtration of the PSs on a column of Sephadex-150 showed their polydispersity.

The further separation of the PSs eluted by water was performed by fractional precipitation with ethanol. Homogeneous fractions (according to the results of gel filtration on Sephadex G-150) were obtained with yields of 33 and 49% (on the initial PSs). Arabinose, mannose, and glucose were detected in hydrolysates. The predominating amount of mannose in the polysaccharides shows that they belonged to the mannan group. On this basis, the fractions were called ungeromannan F and ungeromannan S, respectively. The ratios of the monosaccharides after the mannans had been purified with the aid of Fehling's reagent [3] was as follows: for ungeromannan F, 1.2:97:1 and for ungeromannan S, 1.4:90:1. The characteristics of the mannans are given below:

	Ratio of the monosaccharides	Mol. wt.	η_{red}	$[\alpha]_D^{20}$, deg.	O—Ac, %
Ungeromannan F	1.2:93:1	93,000	13.78	—36.3	6.89
Ungeromannan S	1:91:1	61,000	15.65	—28.1	6.42

The IR spectra of the mannans had absorption bands at (cm^{-1}) 820 (pyranose ring) and 880 (β-glycosidic bond), and also bands at 1740 and 1250 cm^{-1} (ester group), which were absent from the IR spectra of the mannans fractionated by Fehling's reagent. The O—Ac groups were determined quantitatively by a handbook method [4].

Ungeromannans F and S were subjected to periodate oxidation, and the products of Smith degradation were found to contain glycerol, erythritol, and mannose. The formation of appreciable amounts of erythritol shows the predominance of β-1 → 4 bonds between the hexopyranose residues. The presence of unoxidized mannose residues indicates the possibility of branching in these units, but the presence of O—Ac groups in position 2 or 3 is not excluded, either.

Thus, ungeromannans F and S belong to the native-acetylated mannans with a predominance of β-1 → 4 bonds and differ from known compounds [5] by their molecular weights and ratios of the monosaccharides.

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LITERATURE CITED

1. S. K. Sabirova et al., Khim. Prir. Soedin., 700 (1977).
2. M. Kh. Malikova et al., Khim. Prir. Soedin., 533 (1976).
3. N. K. Kochetkov, Methods of Carbohydrate Chemistry [in Russian], Moscow (1967), p. 287.
4. A. V. Obolenskaya et al., Practical Work in the Chemistry of Wood and Cellulose [in Russian], (1965), p. 381.
5. D. A. Rakhimov et al., Khim. Prir. Soedin., 413 (1977).

STUDY OF THE DYNAMICS OF THE ACCUMULATION OF PECTIN SUBSTANCES IN THE FRUIT OF *Sorbus aucuparia*

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The fruit of the mountain ash contains 2% of pectin substances [1]. We have studied the dynamics of the accumulation of water-soluble pectins and of protopectin in the fruit of the mountain ash in dependence of the stage of its ripening. The fruit of *Sorbus aucuparia* (European mountain ash) was collected in 1978 in the Ryazan' province. Analysis was performed on the air-dry fruit. The substances were exhaustively extracted by a standard method [2] and were precipitated with 96% ethanol. The information given below shows that the pectin substances in them accumulate differently according to the stage of ripening of the fruit (% on the absolutely dry weight):

Color of the fruit	Total amount of pectin substances	Water-soluble pectins	Protopectin
Green (June 26)	12.02	0.32	11.70
Brown (July 8)	8.04	1.07	6.97
Orange (July 26)	7.80	1.27	6.53
Orange-red (August 20)	6.32	1.43	4.89

Green fruit contained only a small amount of water-soluble pectins. As the fruit ripened, their amount increased. The maximum amount of protopectin was found in the green-fruit stage, and then its amount fell and by the time of full ripeness it had decreased to less than half.

We also used the method of determining pectin substances by precipitation with calcium chloride. The pectin substances were extracted from the fruit with 0.3 N HCl, and precipitation was carried out in two variants: with calcium chloride and with ethanol. As statistical treatment of the results of the two experiments shows, the two methods are characterized by high reproducibility and high accuracy and they do not show great disagreements. The determination of the pectin substances by precipitation with ethanol proved to be simpler and quicker:

Repetition of the experiment	Amount of pectin substances (%) precipitated by		Reproducibility on precipitation by
	calcium chloride	ethanol	
1	3,78	4,04	Calcium chloride
2	4,03	3,86	$\Sigma(X_{av} - X)^2 = 0.3754$
3	3,56	3,72	$Sn = 0.2042$
4	3,53	3,98	$E_{rel} = \pm 1.46$
5	3,39	4,09	Ethanol
6	3,78	3,66	$\Sigma(X_{av} - X)^2 = 0.2558$
7	3,46	3,79	$Sn = 0.1686$
8	3,53	3,62	$E_{rel} = \pm 1.21$
9	3,83	3,92	
10	3,49	3,68	
	X_{av}=3,64	X_{av}=3,84	

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