

BRIEF COMMUNICATIONS

PLANT POLYSACCHARIDES.

VI. POLYSACCHARIDES OF REPRESENTATIVES OF THE MALVACEAE FAMILY

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The polysaccharide contents of some species of the Malvaceae family have been investigated previously [1]. Continuing a search for mucilage-containing plants, we have studied representatives of several genera of this family. We give comparative results for the water-soluble polysaccharides (WSPSs) of: I) *Alcea rosea f. rosea*; II) *A. rosea f. nigra*; III) *A. rosea f. ruber*; IV) *A. neduflo*; V) *Abutilon adans*; VI) *Hibiscus ssp.* (hybrid variety M. Gor'kii); VII) *Malva mavritana*; and VIII) *Gossypium* (cotton). The specimens were gathered on the territory of the Botanical Garden of the Academy of Sciences of the Republic of Uzbekistan. We used the stems of the plants for investigation.

The polysaccharides were isolated by extraction with water followed by precipitation with ethanol [2]. The quantitative and qualitative compositions of the polysaccharides were determined, after acid hydrolysis, by PC and GLC in the form of aldonitrile acetates [3]. Information on the WSPS contents (in percentages on the air-dry raw material) and their monosaccharide compositions is given in Table 1.

The total polysaccharide contents ranged from 1.5 to 4.0%. The WSPSs formed a white or light brown powder containing no starch, as was shown by a negative reaction with iodine. Samples of the polysaccharides (I-V) had relative viscosities of from 4.2 to 25.0, and in water they formed viscous solutions of mucilaginous nature, while the alkalization of these solutions with ammonia or caustic soda gave a yellow coloration (presence of mucilage) [4].

A comparison of the monosaccharide compositions of polysaccharides (I-VIII) showed their almost monotypicity, with differences only in the quantitative ratios. It must be mentioned that rhamnose considerably predominated in all the samples, which showed the presence of a rhamnan as a component of the WSPSs.

The IR spectra of the WSPS investigated were taken on a Perkin-Elmer 2000 Fourier IR spectrometer. In the IR spectrum of a nonmucilaginous WSPS the absorption of a carbonyl group was represented by a maximum in the 1750 cm⁻¹ region, while in the IR spectra of mucilaginous WSPSs this maximum was observed at 1717 cm⁻¹, and a hydroxy group absorbed at 3600-3000 cm⁻¹. Consequently, it is possible to distinguish nonmucilaginous from mucilaginous WSPSs on the basis of their IR spectra.

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TABLE 1. Physicochemical Constants of the WSPSs of Stems of Plants of the Malvaceae Family

Sample	Yield of WSPSs	MM	η_{rel}	Percentage of uronic acid	Monosaccharide ratios								
					Rha	Ara	Xyl	Man	Glb	Gal	GalUA	GluUA	
I. <i>Alcea rosea</i> L. f. rosea	1.3	24300	5.4	46.5	17.6	2.0	Tr.	Tr.	Tr.	1.0	2.8	+	+
II. <i>Alcea rosea</i> L. f. nigra	2.8	29200	4.8	40.5	27.5	5.0	Tr.	Tr.	Tr.	1.0	1.0	+	+
III. <i>Alcea rosea</i> L. f. ruber	2.6	38900	4.3	35.7	20.0	1.2	Tr.	Tr.	Tr.	Tr.	1.0	+	+
IV. <i>Alcea nudiflora</i>	4.0	36700	25.9	35.0	14.0	1.0	1.6	Tr.	Tr.	1.0	Tr.	+	+
V. <i>Abutilon adans</i>	3.0	34100	4.2	30.0	12.0	1.1	1.0	Tr.	Tr.	3.0	Tr.	+	+
VI. <i>Hibiscus</i> sp	1.0	32100	1.2	23.5	12.0	4.0	Tr.	Tr.	Tr.	1.0	2.5	-	-
VII. <i>Malva mavritana</i>	2.0	45000	3.5	27.4	10.0	5.0	Tr.	Tr.	Tr.	1.0	7.5	+	+
VIII. <i>Gossypium</i>	4.0	20000	1.7	24.1	16.6	5.5	3.3	3.3	4.0	3.0	1.0	+	+

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