

CARBOHYDRATE COMPONENTS OF *Eremurus turkestanicus*

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Twenty species of the genus *Eremurus* grow in Uzbekistan [1]. We have studied the carbohydrates of *E. turkestanicus* Rgl. (family Liliaceae) collected in the flowering period in June 1972 in the environs of Chimgan (Western Tien-Shan). (The plant was determined by Candidate of Biological Sciences E. E. Korotkova.) The dried and comminuted air-dry raw material was fixed with boiling 96% ethanol at a final concentration of ethanol of 82%. The free sugars were extracted from a weighed amount (10.0 g) of the material by 82% ethanol in the boiling-water bath for an hour four times. The residue insoluble in ethanol was dried at room temperature and was used for the subsequent extraction of various groups of polysaccharides: water-soluble polysaccharides [2, 3], pectin substances [4], hemicelluloses A and B (1 and 4 N solutions of KOH), and α -cellulose (hydrolysis with sulfuric acid). The results of the investigations are given in Table 1.

The figures in the table show that the tuberous roots and leaves are rich in free sugars. The latter were shown by chromatography to contain glucose, galactose, mannose, fructose, and sucrose. Radial and descending chromatography was performed on Filtrak FN-1 paper (Czechoslovakia) in the butan-1-ol-acetic acid-water (4:1:5) and acetone-butan-1-ol-water (4:5:1) systems for 48 h.

The subterranean organs of *E. turkestanicus* contain a considerable amount of water-soluble polysaccharides, fructosans, and pectin substances. The water-soluble polysaccharides were isolated from the roots by the method of Stepanenko et al. [2]. The polysaccharide obtained consisted of a white amorphous powder which dissolved in water with the formation of sticky strongly opalescent solutions. $[\alpha]_D^{19} -40^\circ$ (c 0.5; water). Its IR spectrum had absorption bands at 820, 890, 1040, 1085, 1260, and 1635-1640 cm^{-1} . The viscosity of a 0.4% aqueous solution, η_{rel} 4.7, determined in an Ostwald viscometer, is 1.5 times greater than that of a solution of eremuran of the same concentration. The polysaccharide gave a red coloration with iodine. The yield of polysaccharide purified through the copper complex was 85.9%. On acid hydrolysis, the initial and the purified polysaccharides gave glucose and mannose in a ratio close to 1:1.8. They were identified chromatographically, and the mannose by conversion into a crystalline derivative (mannose phenylhydrazone with mp 189-190°C).

TABLE 1. Amounts of Carbohydrate Components of *E. turkestanicus* (% on the air-dry raw material)

Plant organs	DP		Polysaccharides						Total amount of carbohydrates
	before inversion	after inversion	water-soluble	pectin substances	hemicelluloses		cellulose	fructosans	
					A	B			
Leaves	17.4	13.3	0.9	4.6	0.51	3.86	1.78	0.3	42.68
Peduncle	16.0	6.6	0.8	1.8	1.45	4.89	2.7	1.56	35.8
Rhizomes	5.5	15.6	4.2	1.4	1.98	4.9	3.85	4.02	41.45
Tuberous roots	7.8	27.7	10.1	2.5	3.33	1.94	3.74	5.31	62.42

* The fructosans were isolated from an individual sample of the inactivated raw material.

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From what has been said above, the polysaccharide that we isolated is similar in its properties and IR spectrum to eremuran [2].

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