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POLYSACCHARIDES OF *Eremurus*.

XXIX. ISOLATION OF A GLUCOMANNAN

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The tuberous roots of some species of the genus *Eremurus* contain a water-soluble glucomannan, which was first isolated from *E. regelii* Vved. and has acquired the name "éremuran" [1]. The properties, structure, and dynamics of the accumulation of éremuran have been found in their general outlines and methods for its practical use have been proposed [2-6]. The preparation of a low-molecular-mass glucomannan and its use as a bioreagent in medicine formed the object of the present investigation.

The air-dry tuberous roots of *E. regelii* (1 kg) ground to 1 mm were extracted with water (1:10) with stirring at room temperature for 2 h. The extract was separated off by centrifugation and was treated with ethyl alcohol in a ratio of 1:2. The precipitate that deposited was dissolved in aqueous trichloroacetic acid and the solution was centrifuged. It was then kept at 80 ± 2°C for 40 min and was treated with ethyl alcohol. The resulting precipitate was washed with increasing concentrations of alcohol (70-96%), dried in vacuum over P_2O_5, and ground to a powder. The yield of polysaccharide was 10-12% of the weight of the air-dry raw material.

The polysaccharide consisted of a white amorphous powder with a yellowish tinge, mp 272-276°C, $[\alpha]_D^{20}$ $-31 \pm 2°$ (*c* 2; H_2O). Soluble in water, practically insoluble in organic solvents (acetone, alcohol, chloroform, ether). The qualitative composition of the polysaccharide — glucose and mannose, 1:2, respectively — was determined by gas–liquid chromatography [7]. It was a glucomannan. Its IR spectrum revealed the following absorption bands (cm^{-1}): 3300-3600 (OH group); 1750, 1250 (ester group); 1650 (adsorbed water); 885, 815 (β-glycosidic bond). The chemical shifts in the ^{13}C NMR spectrum of the glucomannan are given below: (recording and interpretation of the spectrum in accordance with [8, 9]):

	C_1	C_2	C_3	C_4	C_5	C_6
β-*D*-Man$_p$	101.3	71.5	72.9	77.8	76.2	61.8
β-*D*-Glc$_p$	103.8	74.4	76.6	80.0	75.5	61.8

In the spectrum weak signals were detected with chemical shifts of 21.7 and 173.5 ppm relating to the CH_3 and CO atoms of an ester group. The signal at 71.5 ppm showed that the glycosidic centers of 4-substituted mannopyranose residues had the β-configuration of the glycosidic center, and the signal at 103.8 ppm that the glucopyranose residues also had the β-configuration.

The glucomannan is a native acetylated polysaccharide having a linear chain the hexopyranose residues of which are linked with one another by β-1→4 bonds.

The results of biochemical investigations have shown that the glucomannan may be used in immunology and in diagnostic reagents to create a density gradient for separating the cells of peripheral blood in order to obtain a pure population of viable lymphocytes [10].

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