Thus, the glucofructan isolated is a low-molecular-weight polysaccharide with a degree of polymerization of 12 consisting of glucopyranose and fructofuranose residues linked in the inulin manner (2 → 1 bonds). This is the first time that a glucofructan has been isolated from the genus *Ungernia*.

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POLYSACCHARIDES OF *Eremurus*.

XVII. THE STRUCTURE OF A GLUCOFRUCTAN FROM *Eremurus lactiflorus*

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We have previously [1, 2] reported the structure of a glucomannan isolated from the tuberous roots of *Eremurus lactiflorus*. In the present paper we give the results of a study of a glucofructan from this plant.

The comminuted air-dry raw material was first treated with ethanol and was extracted with water at room temperature. The mother solution after the precipitation of a glucomannan from the aqueous extract [3] was concentrated and, to eliminate proteins and clarify it, it was treated with a solution of neutral lead acetate, the excess of which was precipitated with a solution of Na_2SO_4. To eliminate the low-molecular-weight compounds the solution was dialyzed in countercurrent. The dialyzed solution was evaporated to a syrup and was treated with acetone, which converted it into a powder. The yield of water-soluble carbohydrate was 2.48% (on the air-dry raw material). It consisted of a hygroscopic white powder readily soluble in water. In the products of complete acid hydrolysis (0.5 N H_2SO_4, 90°C, 0.5 h), PC showed the presence of mainly fructose, with traces of glucose. Consequently, the carbohydrate was a glucofructan (GF). The GF was separated on a column of Sephadex G-25 and G-50, which led to a homogeneous GF with a molecular weight of 1200 and a degree of polymerization of 7. It possessed no reducing capacity, and the ratio of fructose and glucose according to the ^{13}C NMR spectrum was 6 : 1, respectively. IR spectrum, λ_{max}^{KBr}, cm^{-1}: 3400 (OH); 880 (β-glycosidic bond), 820 (hexapyranose ring), and 940 (furanose ring) [4].

To determine the type of bond in the GF, it was methylated by Hakomori's method [5]. After formolysis and hydrolysis of the permethylate of the GF, by TLC on Silufol (methyl ethyl ketone—1% ammonia (30 : 4) system) and by the GLC of the trifluoroacetates of the corresponding polyols [6], using comparison with known samples, 3,4,6-tri-O-Me-fructose, 1,3,4,6-tetra-O-Me-fructose, and 2,3,4,6-tetra-OMe-glucose were identified.

The results of methylation were confirmed by those of periodate oxidation. The GF was oxidized by the method of Khodzhaeva and Ismailov [7], consuming 1 mole of $NaIO_4$ per monosaccharide unit. Glycerol was found by PC in the products of Smith degradation. The results of methylation and periodate oxidation permit the assumption for the glucofructan of a structure with 2 → 1 bonds between the hexose residues.

The ^{13}C NMR spectrum also showed the presence of 2 → 1 bonds in the GF. The spectrum contained peaks with chemical shifts corresponding to residues of β-2 → 1-bound fructofuranoside units (ppm):

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	C_1	C_2	C_3	C_4	C_5	C_6
Residues of β-2→1-bound fructose units	62.0	104.2	78.8	75.7	82.3	63.4
Residues of α-1 → 2-bound fructose units	93.4	72.7	73.7	70.45	72.7	62.0

The glucose was present at the nonreducing end of the polymer chain and was attached to C_2 of a fructose unit, as was shown by the magnitude of the chemical shift of the C-1 atom of α-D-Glcp (93.4 ppm), which is characteristic for this type of linkage.

Thus, it has been established that the monosaccharide residues of the glucofructan of *E. lactiflorus* are linked by β-2 → 1 bonds in the inulin manner and there is glucose residue at the nonreducing end.

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FATTY ACID COMPOSITION OF THE LIPIDS OF POLLEN (POLLEN PELLETS) OF SOME HERBACEOUS PLANTS. III.

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Continuing a study of the fatty acid composition of the lipids of pollen (pollen pellets) of honey-bearing plants, we have investigated the pollen collected by bees from common dandelion (*Taraxacum officinale* Wigg.), fireweed (*Chamaenerion angustifolium* Scop.), buckwheat (*Fagopyrum esculentum* Moench.), and red clover (*Trifolium pratense* L.).

We have previously established that pollen (pollen pellets) of the common dandelion and red clover contains carotenoids, leucoanthocyanidins, flavonols, and ascorbic, chlorogenic, and triterpene acids [1].

By using the previous methods for the isolation and identification of the acids [2], we detected about 17 acids in the lipids of dandelion pollen. Among them, palmitic, stearic, linoleic, and linolenic predominated. In addition to these acids, the clover pollen contained palmitoleic acid (12.8%). The fatty acid composition of the fireweed lipids differed sharply from those of the lipids of all the other samples of pollen studied [2, 3]. Only two acids predominated in the fireweed lipids — linoleic (83.68%) and palmitic (15.88%).

By comparing the results that we obtained previously (pollens of three species of willow and of plants of the Rosaceae family [2, 3]) it can be seen that the pollen of herbaceous plants contains unsaturated acids of high molecular weight that are absent from that of woody plants. The presence of arachidonic acid, $C_{20:4}$, in the clover and buckwheat pollen deserves particular attention.

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