

BRIEF COMMUNICATIONS

CARBOHYDRATES, CARBOHYDRATE ETHERS, AND ALCOHOLS OF *Salsola collina*

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Continuing investigations of the chemical composition of extractive substances of *Salsola collina* Pall. [1, 2], by column chromatography on polyamide, carbon, and silica gel we have isolated carbohydrates, carbohydrate ethers, and polyhydric alcohols from the water-soluble part of the butanol-soluble fraction of an 80% ethanolic extract.

Analysis of the fractions containing carbohydrates and alcohols in various ratios was performed on a Kovo GPC-822 liquid chromatograph (Czechoslovakia) under conditions described previously [3]. The carbohydrates sucrose, D-glucose, and D-fructose, and the polyhydric alcohols myo-inositol and D-mannitol were identified. D-mannitol, $C_6H_{14}O_6$, mp 164-166°C was also isolated by chromatography on silica gel and its structure was confirmed by its spectral characteristics: ^{13}C NMR spectrum (D_2O , δ , ppm): 64.50 (C-1.6); 70.72(C-2.5); 72.13 (C-3.4); FAB-MS, m/z 183 ($M + H$) $^+$.

By preparative liquid chromatograph on a column (9 × 600 mm) of a sulfopolystyrene cation-exchange resin [3] and column chromatograph on silica gel using chloroform-methanol-water (63:23:3) as eluent we isolated a transparent vitreous mass consisting, according to PMR spectra, of a mixture of ethyl ethers of D-glucose (I) and D-fructose (II) in a ratio of 4:1. The FAB-MS spectrum of these compounds had ions with m/z 209 ($M + H$) $^+$ and 163 ($M - C_2H_6O$) $^+$, confirming the molecular masses of the substances. Characteristic for the spectrum was the presence of distinct cluster ions with m/z 417 ($2M - H$) $^+$; 371 [$(M - C_2H_6O) \times 3 + H$] $^+$ and 325 [$(M - C_2H_6O) \times 2 + H$] $^+$.

The positions of attachment of the ethyl groups were determined from ^{13}C NMR spectra. The assignment of the carbon signals is given below (δ , ppm):

Compound	C-1	C-2	C-3	C-4	C-5	C-6	-CH ₂	-CH ₃
I	102,3	73,56	76,26*	70,10	76,34*	61,22	66,57	14,72
II	60,57	104,22	76,94	75,49	81,54	63,23	57,68	15,15

The CSs of the carbon atoms corresponded to the structures ethyl β -D-glucopyranoside and ethyl β -D-fructopyranoside. The isolation of ethyl D-glucoside from sea urchins [4] and of ethyl fructoside from the seeds of *Hydnocarpus authelminica* [5] has been reported previously.

LITERATURE CITED

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