

The presence of the methylated sugars mentioned and the absence of di- and monomethyl derivatives, together with the negative specific rotation of the polysaccharide and the results of oxidation with chromium trioxide, indicate that the glucomannan of *E. cristatus* is formed by a linear unbranched chain with β -(1 \rightarrow 4)-glycosidic bonds.

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A STUDY OF THE FATTY-ACID COMPOSITION OF THE TRIACYLGLYCERIDES OF THE POLLEN (POLLEN PELLETS) OF SOME HONEY-BEARING PLANTS.

II. FATTY-ACID COMPOSITION OF THE TRIACYLGLYCERIDES OF THE POLLEN (POLLEN PELLETS) OF SOME PLANTS OF THE FAMILY *Rosaceae*

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We have investigated the fatty acid composition of triacylglycerides of the pollen (pollen pellets) collected by honeybees in 1980 from apple (*Malus domestica* Borkh.), fig (*Pyrus domestica* Medic.), cherry (*Cerasus vulgaris* Mill.), and raspberry (*Rubus idaeus* L.). We have described the methods of isolating and identifying the acids previously [1]. Table 1 gives

TABLE 1. Fatty-Acid Compositions of the Triglycerides of the Pollens (pollen pellets) of a Number of Plants of the Family *Rosaceae*

Fatty acid	Amounts of the fatty acid, wt.%, on the total amount of acids in the pollen			
	apple	fig	cherry	raspberry
10:0	Tr.	0.15	Tr.	Tr.
12:0	1.14	0.84	1.72	2.22
14:0	0.85	2.07	0.74	0.30
14:1	Tr.	0.76	1.09	Tr.
15:0	0.20	0.13	Tr.	0.14
iso-16:0	Tr.	1.39	0.47	0.59
16:0	33.83	25.05	11.66	2.51
16:1	0.33	0.25	0.16	0.31
16:2	Tr.	0.27	0.11	0.14
17:0	0.21	0.59	0.12	0.15
17:1	0.18	0.27	0.22	Tr.
17:2	Tr.	0.45	0.46	Tr.
18:0	3.67	4.14	3.03	5.12
18:1	13.39	14.32	10.19	3.16
18:2	10.59	32.85	30.02	6.31
18:3	32.38	11.96	37.91	52.19
*	0.21	1.53	0.45	26.19
19:0	0.47	0.50	0.56	Tr.
20:0	0.63	0.94	0.52	0.17
21:0	1.91	1.50	0.40	0.28

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the compositions of the fatty acids established from the results of GLC. In a comparison of the quantitative compositions of the fatty acids of the lipids of the pollen of species of willow and the pollen of species of the family *Rosaceae* attention is attracted by the presence in the lipids of the latter of an acid which we have not identified. In raspberry pollen it amounts to 26%.

The amount of unsaturated acids was highest in the lipids of the cherry pollen, and that of linoleic acid in the raspberry pollen. As can be seen from Table 1, triacylglycerides includes the 14:1, 16:2, and 17:2 acids the presence of which is uncharacteristic for the acids of higher plants. This is explained by the fact that pollen pellets [1] were subjected to analysis. At the present time, the supply of pollen for medicinal purposes has been set up and therefore a study of its chemical composition is all the more important since the pollen (pollen pellets) collected by bees from different plants may possess different medicinal effects [2].

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FATTY-ACID COMPOSITION OF PUMPKINSEED OIL

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In the preparation of the total extracts from unsaponified pumpkin seeds for investigating their amino acid composition, one of the stages of the technological process is defatting. Extraction is carried out usually with petroleum ether or chloroform. After the elimination of the solvent at 59–62°C followed by purification, a pumpkin oil is obtained which is assigned to the edible oils, and its refined form to the higher varieties of "salad" oil [1]. The fatty acids obtained from pumpkin seeds (varieties Mindal'naya, Mozoleevskaya, Ukrainskaya mnogoplodnaya, Volzhskaya seraya, Stofuntovaya, Vitaminnaya) are similar in external form and physical constants and in their basic indices they are similar to sunflowerseed and cottonseed oils [2]. The coloration of all the fatty oils from unpurified seeds is always the same — from cherry-red to cherry-brown with a green fluorescence.

We have investigated the compositions of the fatty acids of the oils by the TLC method. The oils were subjected to hydrolysis and esterification as described by Metcalfe et al. [2]. The fatty acid methyl esters obtained were analyzed on a Varian model 3700 instrument using a column (0.2 cm × 1 m) containing 10% of SP-2330 on Chromosorb WAW (100–120 mesh) at temperatures programmed from 150 to 220°C with a rate of flow of helium of 20 ml/min. For comparison, under the same conditions, we analyzed sunflowerseed oil, the fatty acid composition of which proved to be practically identical with that of the oils investigated.

The results of the GLC of the pumpkinseed oils are given below (%):

Acid	Vitamin-naya	Stofunto-vaya	Mind-al'naya	Mozoleev-skaya	Volzhskaya seraya	Ukrainskaya mnogoplodnaya
Palmitic (16:0)	13.5	15.9	10.7	13.2	11.0	11.8
Stearic (18:0)	6.3	5.7	5.0	6.2	5.5	5.4
Oleic (18:1)	25.0	20.2	29.1	27.2	26.1	27.6
Linoleic (18:2)	55.2	58.2	55.2	53.4	56.4	55.2

As we see, all the oils studied have the same fatty acid composition the bulk being represented by unsaturated acids (18:1, 18:2). The results of the investigation performed permit the recommendation of the complex utilization of pumpkin seeds for the preparation of

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