The inulin was methylated by Purdie's and Kuhn's methods [9, 10]. In a hydrolysate of the permethylate, which had $[\alpha]_D^{20}$ −49°, the following sugar methyl ethers were detected: 2,3,4,6-tetra-O-methylglucose, 1,3,4,6-tetra-O-methyl fructose, 3,4,6-tri-O-methylfructose, and 3,6-di-O-methylfructose in a ratio of 1:2:31:1. The methylated sugars were identified in the form of the trifluoroacetates [11].

Thus, the inulin from *Inula grandis* Schrenk. is a glucofructan with a DP of 35 consisting of β—(2 → 1)-bound fructofuranose units with a glucose residue at the nonreducing end and branching at C—4 of a fructofuranose residue, and it has the structural formula:

β-*D*-Fruf-2-[-1-β-*D*-Fruf-2-]$_{31}$-1-Fruf-(2 → 1)-α-*D*-Glcp .
↑4
|2
β-*D*-Fruf

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PHOSPHOLIPIDS OF THE SEEDS OF *Hippophaë rhamnoides*

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The oil of the common sea buckthorn contains about 1% of phospholipids (PLs) [1], and the phospholipids of the seeds have not been studied.

The seeds were separated from the pulp obtained in the Biisk vitamin factory. The oil was extracted with hexane and the phospholipids were obtained and freed from accompanying substances as described previously [2]. The yield of total phospholipids was 0.6% on the weight of the seeds. Two-dimensional TLC [1st direction: chloroform—methanol—25% ammonia (70:30:5); 2nd direction: chloroform—methanol—acetic acid—water (14:5:1:1)] showed the presence of ten phosphorus-containing compounds. With the aid of qualitative reactions and literature information [3], the following phospholipids were identified: X_1; N-acylphosphatidylethanolamine (N-acyl-PE) and its lyso analog (lyso-N-acyl-PE); phosphatidylethanolamine (PE), phosphatidylcholine (PC); phosphatidylinositol (PI); phosphatidylglycerol (PG); phosphatidic acid (PA); lyso-PI; and lyso-PC.

With the aid of column chromatography and preparative TLC [2] the PC, PE, PI, PG, PA, lyso-PC, and lyso-PI were isolated in the homogeneous form, while the N-acyl-PE, lyso-N-acyl-PE, and X_1 were not studied chemically because of their small amounts. The homogeneous PC, PE, PI, and PG fractions were subjected to alkaline hydrolysis and to enzymatic hydrolysis with phospholipase A_2 (snake venom of *Vipera lebatina* L.), and the total fatty-acid compositions of the PC, lyso-PC, and lyso-PI were determined with the aid of alkaline hydrolysis (Table 1).

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TABLE 1. Composition and Position Distribution of the Fatty Acid Radicals in the Phospholipids of Common Sea Buckthorn Seeds

Acid	10:0	12:0	14:0	15:0	16:0	16:1	16:2	17:0	18:0	18:1	18:2	18:3	ΣS	ΣU
Phosphatidylcholine														
Total	1.1	—	1.1	0.9	17.8	2.1	1.2	0.7	9.3	19.1	39.5	7.2	30.9	69.1
1	2.2	—	1.2	0.8	25.0	2.4	0.9	1.4	14.1	17.5	31.7	2.8	44.7	55.3
2	—	—	1.0	1.0	10.6	1.8	1.5	—	4.5	20.7	47.3	11.6	17.1	82.9
Phosphatidylinositol														
Total	0.9	—	0.9	0.9	30.6	1.2	0.9	—	8.2	9.2	32.0	15.2	41.5	58.5
1	1.4	—	0.9	1.1	56.2	1.7	1.3	—	14.7	8.5	13.4	0.8	74.3	25.7
2	0.4	—	0.9	0.7	5.0	0.7	0.5	—	1.7	9.9	50.6	29.6	8.7	91.3
Phosphotidylethanolamine														
Total	0.3	0.1	0.6	0.6	15.5	2.2	0.8	0.6	7.9	14.7	47.2	9.7	25.4	74.6
1	—	—	—	—	18.0	1.3	0.3	0.4	12.0	13.9	45.6	8.5	30.4	69.6
2	0.6	0.2	1.2	1.2	12.6	3.1	1.3	0.8	3.8	15.5	48.8	10.9	20.4	79.6
Phosphatidylglycerol														
Total	3.4	2.5	2.1	1.3	25.4	8.1	3.4	1.3	8.9	13.6	19.0	11.0	44.9	55.1
1	4.6	1.5	2.0	0.4	28.6	7.0	2.5	0.7	10.5	15.8	12.6	13.8	48.3	51.7
2	2.2	3.5	2.2	2.2	22.2	9.2	4.3	1.9	7.3	11.4	25.4	8.2	41.5	58.5
Lysophosphatidylinositol														
Total	6.8	3.8	2.7	2.9	27.0	5.0	3.6	2.0	1.0	13.5	15.8	5.9	56.2	43.8
Lysophosphatidylcholine														
Total	1.4	—	1.7	1.7	19.3	3.4	6.1	7.4	12.5	21.3	20.8	4.4	44.0	56.0
Phosphatidic acid														
Total	1.2	0.6	1.5	1.2	18.4	4.1	1.7	2.7	7.4	18.8	29.9	12.5	33.0	67.0

The methyl esters of the fatty acids were analyzed on a Chrom 41 chromatograph with a column 2.5 m long containing the solid phase Celite 545, 60-80 mesh, impregnated with 17% of PEGS at a temperature of 200°C with helium as the carrier gas.

On the whole, the fatty acid composition of the homogeneous phospholipids differed both qualitatively and quantitatively from the fatty acid composition of the total phospholipids isolated from the oil, the oil of the juice, and the oil of the seeds of the fruit [1, 4, 5].

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