BRIEF COMMUNICATIONS

PHOSPHOLIPIDS OF THE SEEDS OF *Lycopersicon esculentum* MILL. AND *Vitis viniferi* L.

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UDC 547.953:665.37

We have investigated wastes of a food industry: grape and tomato seeds. The isolation and purification of the total phospholipids (PLs) was carried out by the usual method [1]. The yield of phospholipids from grape seeds was 0.3% and from tomato seeds 0.4%.

With the aid of two-dimensional TLC (first direction: chloroform–methanol–25% ammonia (70:30:5); second direction: chloroform–methanol–acetic acid–water (14:5:1:1), we identified phosphatidylcholine (PC), phosphatidylinositol (PI), phosphatidylethanolamine (PE), phosphatidic acid (PA), lyso-PC, and lyso-PI, and we also detected an unidentified compound (X). In the tomato seeds, the PA and the X were found in trace amounts, and we were therefore unable to isolate them for structural investigations (there was no lyso-PI).

TABLE 1. Composition and Position Distribution of the Fatty Acids in the Phospholipids of Tomato and Grape Seeds

Phospholipid	10:0	11:0	12:0	14:0	15:0	16:0	16:1	16:2	17:0	18:0	18:1	18:2	18:3	20:0	ΣS	ΣU
Phosphatidylcholine																
Tomato PLs																
Total	—	—	0,2	0,2	—	15,2	0,8	—	0,9	4,6	19,3	56,3	2,5	—	21,1	78,9
1	—	—	0,4	0,4	—	29,4	1,2	—	1,8	9,2	15,7	38,9	3,0	—	41,2	58,8
2	—	—	—	—	—	1,0	0,4	—	—	—	22,9	73,7	2,0	—	1,0	99,0
Phosphatidylethanolamine																
Total	0,4	—	0,4	0,3	—	20,3	1,5	—	0,7	4,5	13,6	54,9	3,4	—	26,6	73,8
1	0,8	—	0,3	0,2	—	35,1	2,1	—	1,4	7,4	12,3	36,7	3,7	—	45,2	54,4
2	—	—	0,5	0,4	—	5,5	0,9	—	—	1,6	14,9	73,1	3,1	—	8,0	92,0
Phosphatidylinositol																
Total	0,4	—	0,7	0,7	—	23,3	5,4	—	1,4	9,3	14,5	42,0	2,1	—	36,0	64,0
1	—	—	—	—	—	33,0	8,0	—	1,6	13,5	12,2	29,7	2,1	—	48,0	52,0
2	0,8	—	1,4	1,4	—	14,0	2,8	—	1,2	5,1	16,8	54,3	2,1	—	24,0	76,0
Lyso-PC	0,3	—	0,4	0,3	—	18,8	0,9	—	0,9	6,1	17,4	52,9	2,0	—	26,8	73,2
Phosphatidylcholine																
Grape PLs																
Total	0,3	—	—	0,3	0,3	7,9	0,8	0,6	—	5,5	19,0	53,5	1,8	—	24,3	75,7
1	0,6	—	—	0,6	0,6	31,5	0,1	1,2	—	9,5	13,7	40,1	2,1	—	42,8	57,2
2	—	—	—	—	—	4,3	1,5	—	—	1,5	24,3	68,9	1,5	—	5,8	94,2
Phosphatidylethanolamine																
Total	0,2	0,2	0,4	1,3	0,6	25,6	0,9	0,7	—	5,2	1,1	46,9	5,8	1,1	34,6	65,4
1	0,2	0,1	0,3	2,0	0,6	41,9	0,9	1,4	—	8,2	7,1	26,6	8,3	2,2	55,5	44,5
2	0,2	0,3	0,5	0,6	0,6	9,3	0,9	—	—	2,0	15,1	67,2	3,3	—	13,5	86,5
Phosphatidylinositol																
Total	0,5	—	0,4	0,2	0,2	37,1	1,2	1,4	—	7,1	12,4	37,0	2,5	—	45,5	54,5
1	0,7	—	0,8	—	—	69,8	1,9	2,8	—	13,0	8,7	0,3	2,0	—	84,3	15,7
2	0,3	—	—	0,4	0,4	4,4	0,5	—	—	1,2	16,1	73,7	3,0	—	6,7	93,3
PA	1,6	—	1,7	2,0	1,8	21,4	4,2	1,6	—	5,5	14,7	40,5	5,0	—	31,0	66,0
Lyso-PC	8,8	—	8,0	7,4	6,3	17,4	9,6	—	—	3,6	12,4	26,5	—	—	51,5	48,5
Lyso-PI	-	—	6,2	7,4	6,5	23,1	7,7	6,8	—	6,5	12,4	23,4	—	—	49,7	50,3

1 and 2 are the positions of the fatty acids in the glycerol moieties of the phospholipid molecules.

Institute of the Chemistry of Plant Substances, Academy of Sciences of the Uzbek SSR, Tashkent. Translated from Khimiya Prirodnykh Soedinenii, No. 4, pp. 513-514, July-August, 1982. Original article submitted February 23, 1982.

0009-3130/82/1804-0481$07.50

The isolation of the homogeneous phospholipids — PC, PI, PE, PA, lyso-PC, and lyso-PI — was carried out with the aid of column chromatography and preparative TLC. For the first three phospholipids the position distribution of the fatty acid radicals was established with the aid of enzymatic hydrolysis (snake venom), and for the others the total composition was determined (by alkaline hydrolysis) [1] (Table 1).

We observed no predominance of any individual phospholipid in the tomato seeds, but we must point out the high yield of lyso-PC (22% of the total phospholipids), which is probably connected with the deacylation of the PC in the industrial treatment of the tomatoes. In the grape seeds, the main components were PC, PE, PI and PA.

The qualitative and quantitative compositions of the fatty acids of homogeneous phospholipids differed from the fatty acid compositions of the oils of tomato and grape seeds [2].

The following conclusion can be drawn: In the industrial cycle, tomato [3] and grape seeds retain their phospholipids. A comparison of the results obtained with those available in the literature on plant phospholipids showed that no marked structural changes take place in the composition of the phospholipids.

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MONOSACCHARIDE COMPOSITION OF A GLYCOPROTEIN SYNTHESIZED *In Vitro* BY NUCLEI OF RABBIT BRAIN NEURONS

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UDC 612:591:04

There is information in the literature which shows changes in the process of development of the glycoproteins present in the human brain [1] and also in the structural configuration of the carbohydrate moiety of the proteins of the mucous secretion of the stomach [2]. It is assumed that the soluble glycoproteins are the precursors of the glycoproteins of the cell membranes and participate in the long-term regulation of the functioning of these membranes [2].

We have studied the monosaccharide composition of the carbohydrate moiety of the glycoproteins synthesized *in vitro* by the nuclei of the neurons of the grey matter of the rabbit brain. The rabbit brains were taken immediately after sacrifice. The neuronal nuclei and the synthesis of protein in them were carried out by a procedure described previously [3].

The proteins synthesized *in vitro* by the rabbit brain neuron nuclei were obtained by extraction in Tris-glycine buffer, pH 8.3. Then the total protein was fractionated on Sephadex G-50 in ammonium acetate buffer, pH 6.06. The fractions obtained were dialyzed against water and freeze-dried. The Tris-glycine fraction (II) [4] was studied.

We determined the amino acid composition of this acidic protein and performed electrophoretic analysis in 10% polyacrylamide gel, pH 8.3. The molecular weight was ~15,000.

To determine the monosaccharide composition of this fraction, the glycoprotein was hydrolyzed with 2 N H_2SO_4 at 100°C for 8–10 h. The hydrolysate, after neutralization with an anion-exchange resin and concentration, was analyzed by thin-layer chromatography in a fixed layer of KSK silica gel in the systems butan-1-ol–methanol–water (5:3:1) (1) and

Institute of Bioorganic Chemistry, Academy of Sciences of the Uzbek SSR, Tashkent.
Translated from Khimiya Prirodnykh Soedinenii, No. 4, pp. 514-515, July-August, 1982.
Original article submitted February 26, 1982.

 0009-3130/82/1804-0482$07.50