PHOSPHOLIPIDS OF THE COTTON PLANT OF THE VARIETY "TASHKENT-1"

M. U. Babaev, Kh. S. Mukhamedova, and S. T. Akramov

UDC 547.953:665.37

There is no information in the literature on the phospholipids of the new wilt-resistant varieties of the cotton plant. The present paper gives the results of a study of the total phospholipids isolated from the defatted seed kernels by Folch's method [1]. The yield of combined phospholipids was 1.5% of the weight of the undefatted kernels, and their P content was 2.5% [2, 3]. Their fractional composition was determined by two-dimensional TLC from the amounts of P in the spots [4]. The amount of phosphatidylcholines was 50.2%, of phosphatidylinositols 26.6%, of phosphatidylethanolamines 13.4%, of polyglycerophospahtes 2.6%, and of unidentified phospholipids 4.2% (I) and 3.0% (II).

The individual fractions of the phospholipids present in greatest amount were obtained by separating the total material on a column of silica gel with subsequent preparative subfractionation by the TLC method. Both the total and the individual homogeneous fractions of phosphatidylcholines, phosphatidylinositols, and phosphatidylethanolamines were deacylated by alkal ne saponification, and the fatty acids split off, in the form of their methyl esters, were analyzed by GLC (Table 1). For comparison, a chromatogram of thefatty acids of the glycerides of the oil was also obtained [5].

It can be seen from Table 1 that both in the varieties of the cotton plants studied previously and in the variety "Tashkent-1" the total phospholipids have a more saturated nature than the glycerides. Among the saturated acids in all the fractions palmitic acid predominates, and among the unsaturated acids linoleic. The degree of saturation of the individual fractions of the phospholipids increases in the following sequence: phosphatidylcholines → phosphatidylethanolamines → phosphatidylinositols.

The amount of phytin in the meal after the extraction of the neutral lipids and the phospholipids was determined [6]; it amounted to 4.8% on the initial raw material.

TABLE 1

Fatty acids	Triglycerides	Total phospholipids	Individual fract. of the phospholipid		
			phosphatidylcholines	phosphatidylethanolam.	phosphatidylinositols
$C_{10:0}$	—	1,96	—	2,46	—
$C_{12:0}$	—	1,24	—	2,18	—
$C_{14:0}$	1,13	1,05	1,22	1,78	2,35
$C_{16:0}$	25,76	25,14	18,18	22,11	31,91
$C_{16:1}$	2,30	0,96	1,74	3,83	3,66
$C_{18:0}$	2,08	1,80	3,21	4,11	5,64
$C_{18:1}$	13,14	15,72	23,04	12,47	10,43
$C_{18:2}$	55,58	52,12	52,61	51,06	46,01
Sum of the saturated acids	28,97	31,19	22,61	32,64	39,90
Sum of the unsaturated acids	71,02	68,80	77,39	67,36	60,10

Order of the Red Banner of Labor Institute of the Chemistry of Plant Substances of the Academy of Sciences of the Uzbek SSR. Translated from Khimiya Prirodnykh Soedinenii, No. 3, pp. 417-418, May-June, 1974. Original article submitted November 29, 1973.

LITERATURE CITED

1. J. Folch, M. Lees, and J. H. Sloane-Stanley, J. Biol. Chem., 226, 497 (1957).
2. H. Taussky and E. Shorr, J. Biol. Chem. 202, 675 (1953).
3. D. Tevekelov, Izv. na Instituta po Khranene, Bolg. Akad. Nauk, 7, 21 (1968).
4. É. V. Dyatlovitskaya, T. I. Torkhovskaya, and L. D. Bergel'son, Biokhimiya, 34, 177 (1969).
5. A. U. Umarov, T. V. Chernenko, and A. L. Markman, Maslov.-Zhir. Prom., No. 11, 15 (1971).
6. A. M. Sobolev, Usp. Biol. Khim., 4, 248 (1962).