PHOSPHOLIPIDS OF THE FINE-FIBERED COTTON PLANT, VARIETY S-6029

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We have studied the phospholipids of the seed kernels of the thin-fibered cotton plant of variety S-6029. The comminuted kernels were defatted with petroleum ether (40-60°C) and then with acetone. The phospholipids were extracted by Folch's method [1]. The average yield of the combined phospholipids on the absolutely dry raw material was 1.4%, and their phosphorus content was 2.57%. The qualitative and quantitative compositions of the phospholipids were determined by two-dimensional TLC in a fixed layer of silica gel in the following solvent system: 1) chloroform–methanol–water (65:25:4), and 2) chloroform–methanol–25% ammonia (14:6:1) [2]. Ten spots were found, of which seven contained phosphorus. The spots of the phospholipids on the chromatograms were identified by means of markers and by qualitative color reactions for their functional groups [3]. The quantitative group compositions of the phospholipids were found from the phosphorus contents of the spots on the chromatograms, where the main components were distributed in the following sequence: phosphatidylcholines (PCs) 49%, phosphatidylinositols (PIs) 17%, phosphatidylethanolamines (PEs) 11%, polyglycerophosphatides (PGPs) 7.4%, lysophosphatidylcholines (lyso-PCs) 5.6%, and unidentified phosphorus-containing compounds: more polar, X_1, 7.4%, and less polar, X_2, 2.6%. The phosphorus contents were determined by Tevekelov's method [4]. When the phospholipids were precipitated with ethanol, an ethanol-soluble fraction (68.3%) was obtained in which were found 69.6% of PCs, 3.7% of PIs, 9.7% of PEs, 3.7% of lyso-PCs, and 13.3% of X_1; the ethanol-insoluble fraction amounted to 31.7%, and contained 4.7% of PCs, 44.5% of PIs, 10% of PEs, 22.8% of PGPs, 9.8% of lyso-PCs, and 8.2% of X_2.

The ethanol-soluble and ethanol-insoluble fractions were chromatographed in two parallel columns filled with a suspension of silica gel, 100-150 mesh. To elute the substances from the columns we used mixtures of chloroform and methanol of increasing polarity. In this way we obtained the main homogeneous components (PCs, PIs, and PEs) and their IR spectra coincided with those given in the literature for glycerophospholipids [5-6]. In the products of the acid hydrolysis [7] of all the phospholipids we found fatty acids and glycerol, and also choline in the PCs, ethanolamine in the PEs, and inositol in the PIs, which confirms their assignment to the glycerophospholipids. The fatty acids were identified by the GLC method and the polyols and amino alcohols by chromatography of the water-soluble hydrolyzates in thin layers of silica gel in the solvent system given by Kaufmann [8].

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