BRIEF COMMUNICATIONS

PHOSPHATIDYLINOSITOL OF THE FLOWERS OF COTTON PLANTS OF VARIETY S-4880

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The flowers of the cotton plant, unlike the other organs, have a very short life. The cream-colored flowers opening in the early morning hours have become pink by evening. This effect is apparently the result of deep changes in the redox system of the tissues. The metabolism of phosphorus compounds in the corolla and stem of the flower after its opening takes place extremely vigorously. In its nature, this process is regressive metamorphosis [1, 2].

Phospholipids (PLs), together with proteins, are an invariable component of any biological membrane. Although the biological functions of a membrane are determined, in the first place, by the properties of the membrane proteins, the manifestation of these properties is closely bound up with the presence of lipids in the membrane. In plant and animal PLs a specific position distribution of the fatty acids (FAs) is observed, the saturated FAs being present mainly in the sn-1 position and the unsaturated ones at sn-2 [3-6]. However, this rule is not always followed. In lung tissues disaturated phosphatidylcholine (PC) has been detected, and it sometimes amounts to 30% of the total PC [7, 8]. The lipids of the membrane of Mycoplasma gallisepticum contain disaturated PCs and a phosphatidylglycerol with a position distribution of the FAs that is the opposite of the rule. In tumor PCs a large amount of unsaturated FAs has been found in the sn-1 position, and saturated FAs in the sn-2 position. The considerable deviations from the normal at the membrane and molecular levels apparently not only lead to a change in the chemical and physical properties of the cell membranes but also have a considerable effect on the activity of the membrane-bound enzymes and, consequently, on the biosynthesis of cell components [10].

We have previously shown that an anomalous attachment of FAs in pLs is observed in the phosphatidylinositols (PIs) of second-day flowers of the cotton plant of variety 159-F [11]. In their general form the flowers of the third day differ greatly from those of the second

TABLE 1. Position Distribution of Fatty Acids in the Phosphinositols of Flowers of a Cotton Plant of Variety S-4880 (%, GLC) in the Flowering Period

FA	Time from the beginning of flowering, h								
	0			24			48		
	total	position		total	position		total	position	
		sn-1	sn-2		sn-1	sn-2		sn-1	sn-2
Position	0,1	0,1	0,1	—	—	—	—	—	—
12:0	0,3	0,5	0,1	1,0	0,1	1,9	0,9	1,6	0,2
Position	0,3	0,5	0,1	—	—		—	—	—
iso-14:0	—	—	—	—	—	—	0,2	0,4	Tr.
14:0	1,1	2,1	0,1	1,0	Tr.	2,0	1,1	1,4	0,8
Position	0,6	0,6	0,6	—	—	—	0,1	—	0,2
15:0	0,8	1,6	—	—	—	—	—	—	—
Position	0,2	—	6,4	1,1	Tr.	2,2	0,7	1,0	0,4
iso-16:0	0,1	0,1	0,1		—		—	—	—
16:0	35,3	66,3	19,3	46,4	53,8	39,0	27,1	42,6	11,6
16:1	2,0	3,3	0,7	0,9	1,8	Tr.	1,7	1,9	1,5
Position	1,9	1,7	0,3	—	—	—	1,3	2,1	0,5
iso-18:0	1,5	2,4	0,6	0,8	0,1	1,5	1,0	2,6	0,6
18:0	6,9	10,9	2,9	0,8	1,6	Tr.	7,7	11,8	3,6
18:1	8,8	8,5	9,1	0,9	Tr.	1,8	10,0	12,6	7,4
18:2	21,5	4,7	38,3	29,1	30,6	27,6	28,4	6,4	40,4
18:3	19,5	2,7	36,3	12,7	11,9	13,5	18,7	5,6	31,8
Position	—	—	—	5,5	0,1	10,5	0,5	—	1,0
Σ_s	48,2	80,3	15,6	56,4	55,7	57,1	41,2	68,5	18,9
Σ_u	51,8	19,2	84,4	43,6	44,3	42,9	58,8	31,5	81,1

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day and, particularly, from those that have only just opened. It was natural to assume that the anomalous distribution of the FAs in the PIs of the third-day flowers is either retained or increases. To elucidate this point, flowers of a cotton plant of variety S-4880 were gathered in three time intervals – 0, 24, and 48 hours after opening. The PIs were isolated by column chromatography and preparative thin layer chromatography and were subjected to enzymatic hydrolysis with phospholipase A_2 [11]. The position distribution of the FAs of the PIs of the flowers is shown in Table 1.

From the results of the experiment it must be noted that an increase in the content of FA 16:0 in PI is observed from 0 to 24 h, followed by a drop at 48h. At the same time, with regard to position, the distribution of FA 16:0 at the sn-2 position is roughly the same at 0 and 48 h, yet at 24 h the acid 16:0 in this position is about 4 times as great i.e., the anomaly of its distribution is revealed.

Also remarkable is the decrease almost to the minimum for acids 18:0 and 18:1 at 24 h, and reappearance at 48 h. The diene and triene FA 18:2 and 18:3 are distributed practically evenly at 24 h at both sn-1 and sn-2 positions, although at 0 and 48 h the traditional positional distribution of FA is observed.

The results obtained persuade us that the unusual position distribution of the FAs in the PIs at 24 h is necessary for the development of the flower. This may apparently be connected with a definite functional activity of the PIs in the development of the flowers, since PLs are responsible for a whole series of membrane functions. To these may be assigned chemical and electrical excitation, active ion transport, oxidative phosphorylation, the provision of selective permeability, and other functions of a more general order.

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UNUSUAL ALKALINE HYDROLYSIS OF GIBBERELLIN ISO-A_3 BY A $B_{AL}2$ MECHANISM

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In aqueous alkali, the phytohormone gibberellin A_3 (I) readily isomerizes into gibberellin iso-A_3 (II), which is quantitatively hydrolyzed to the diacid (IV) [1]. To synthesize substance (IV) we carried out the hydrolysis of acid (I) in 1 M aqueous Na_2CO_3 at 100°C and, together with the usual hydrolysis product (IV), we unexpectedly detected (by HPLC) in the reaction mixture a new compound (5:2) for which structure (V) has been proposed. To deter-

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