

MOLECULAR COMPOSITION OF SOYBEAN PHOSPHOLIPIDS

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As reported previously [1], the position specificities of the fatty acids (FAs) in the main components of the phospholipids (PhLs) — phosphatidylcholines (PhCs), phosphatidylethanolamines (PhEs) and phosphatidylinositols (PhIs) — of soybeans of the Uzbekskaya-2 variety have been determined by enzymolysis with the aid of phospholipase A₂.

We give a possible molecular composition of the above-mentioned classes of soybean PhLs, which was calculated by the method of [2]. The calculation has shown that the number of molecular species in the PhEs (58) is greater than in the PhIs (55) and PhCs (29) (Table 1). The quantitatively main molecular species in the PhCs is the 18:2-18:2 (43.1%), and in the PhEs and PhIs, it is the 16:0-18:2 (21.3 and 34.3%, respectively); a considerable contribution is made by the species 16:0-18:2 (15.6%) and 18:0-18:2 (9.3%) in the PhCs, the 18:2-18:2 (15%) and 18:0-18:2 (9.1%) in the PhEs, and the 18:0-18:2 (11.6%) and 18:2-18:2 (7.1%) in the PhIs.

TABLE 1. Position-species Composition of the Main Components of Soybean Phospholipids (species amounting to less than 0.1% not included)

Species	PhCs	PhEs	PhIs	Species	PhCs	PhEs	PhIs
16:0-10:0	0.1	—	0.5	17:0-18:0	—	0.1	0.1
18:0-10:0	0.1	—	0.3	18:0-18:0	0.2	0.2	0.4
18:1-10:0	0.1	—	0.1	18:1-18:0	0.1	0.1	—
18:2-10:0	0.2	—	—	18:2-18:0	0.6	0.4	0.2
12:0-12:0	—	0.1	—	10:0-18:1	—	—	0.3
16:0-12:0	—	0.8	0.7	12:0-18:1	—	0.8	0.5
17:0-12:0	—	0.2	—	14:0-18:1	—	0.5	0.3
18:0-12:0	—	0.3	0.3	15:0-18:1	—	0.5	0.2
18:1-12:0	—	0.1	—	16:0-18:1	1.7	6.5	6.6
18:2-12:0	—	0.6	0.1	17:0-18:1	—	1.1	0.6
18:3-12:0	—	0.1	—	18:0-18:1	1.0	2.4	2.3
10:0-16:0	—	—	0.3	18:1-18:1	0.6	0.7	0.3
12:0-16:0	—	0.5	0.5	18:2-18:1	4.6	3.9	1.3
14:0-16:0	—	0.3	0.3	18:3-18:1	0.3	0.4	0.2
15:0-16:0	—	0.3	0.2	10:0-18:2	—	—	1.5
16:0-16:0	0.7	3.9	6.9	12:0-18:2	—	3.0	2.6
17:0-16:0	—	0.8	0.5	14:0-18:2	0.3	1.8	1.6
18:0-16:0	0.4	1.7	2.4	15:0-18:2	—	0.8	0.9
18:1-16:0	0.3	0.5	0.3	16:0-18:2	15.6	21.3	34.3
18:2-16:0	1.8	2.8	1.4	17:0-18:2	—	4.1	2.6
18:3-16:0	0.1	0.3	0.3	18:0-18:2	9.3	9.1	11.6
12:0-16:1	—	0.2	—	18:1-18:2	6.2	2.6	1.8
14:0-16:1	—	0.1	—	18:2-18:2	43.1	15.0	7.1
15:0-16:1	—	0.1	—	18:3-18:2	3.1	1.7	1.3
16:0-16:1	—	1.2	0.2	10:0-18:3	—	—	0.1
17:0-16:1	—	0.2	—	12:0-18:3	—	0.3	0.2
18:0-16:1	—	0.5	0.1	14:0-18:3	—	0.2	0.1
18:1-16:1	—	0.2	—	15:0-18:3	—	0.2	—
18:2-16:1	—	0.9	0.1	16:0-18:3	1.8	1.9	2.3
18:3-16:1	—	0.1	—	17:0-18:3	—	0.4	0.2
16:0-17:1	—	—	0.2	18:0-18:3	1.1	0.8	0.8
18:0-17:1	—	—	0.1	18:1-18:3	0.7	0.2	0.1
12:0-18:0	—	0.1	0.1	18:2-18:3	5.1	1.4	0.5
16:0-18:0	0.3	0.5	1.2	18:3-18:3	0.4	0.2	0.1

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On the basis of the result for the species compositions of the PhCs, PhEs, and PhIs, we calculated their type composition, %:

	PhCs	PhEs	PhIs
Disaturated (SS)	1.8	9.8	14.7
Diunsaturated (UU)	64.1	27.3	12.8
Unsaturated-saturated (US)	3.3	4.9	2.3
Saturated-unsaturated (SU)	30.8	58.0	70.2

As we see, the UU type predominated in the PhIs, and the SU type in the PhEs and PhIs.

Thus, the main components of the soybean PhLs differ in their fine structure, which is possibly due to different roles of individual species of PhLs in the course of cell processes.

REFERENCES

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