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## LIPIDS OF Potomogeton sp.

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The lipid composition of the freshwater algae growing in the estuary of the R. Volga has scarcely been studied. Investigations of the lipids of freshwater macrophytic algae have been conducted to an extremely limited extent, and the results have been generalized in a number of reviews [1-3]. The composition of the lipids of marine algae has been studied to a greater degree [4-6].

In the present paper we give the results of an analysis of the amounts of various classes of glyco- and phospholipids and the fatty-acid composition of the freshwater alga Potomogeton sp. gathered in the estuary of the R. Volga 150 km to the south of Astrakhan in August, 1990. The extraction of the lipids and the separation and determination of the neutral lipids and the glyco- and phospholipids, and also the analysis of the methyl esters of the fatty acids, were carried out as we have described previously [7, 8]. The composition of the lipids of Potomogeton sp. is given below.

Class of Lipids	PLs, %
Phosphatidylcholine (PC)	30.5 + 2.1
Phosphatidylethanolamine (PE)	22.2 + 1.2
Lysophosphatidylethanolamine	1.9 + 0.2
Phosphatidylserine (PS)	2.8 + 0.3
Phosphatidylglycerol (PG)	18.0 + 0.3
Phosphatidylinositol (PI)	15.0 + 0.4
Phosphatidic acid (PA)	9.6 + 0.6
Phospholipids, % of the total lipids	22.8
Glycolipids, % of the total lipids	43.2
Neutral lipids, % of the total lipids	34.0
Total lipids, mg/g dry weight	39.7

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TABLE 1. Fatty Acid Compositions of the Individual Classes of Lipids

Acid	Total lipids	Neutral lipids	Glycolipids			Phospholipids		
			MGDG	SQDG	DGDG	total PLS	PC	PE
13:0	0.10	0.70	—	—	—	—	—	—
14:0	5.09	10.74	12.31	1.89	2.14	2.55	0.19	2.81
15:0	0.10	3.58	2.85	—	—	0.16	—	0.68
iso-15:0	0.24	—	6.79	0.72	—	—	—	—
16:0	61.80	64.87	8.51	62.26	66.30	53.49	74.85	30.29
16:1	6.32	17.76	3.48	4.71	4.68	0.21	0.26	0.29
16:2	0.20	0.30	7.66	3.67	1.91	2.05	0.50	0.88
17:0	0.23	—	9.50	2.05	2.36	—	—	—
18:0	2.14	0.24	2.42	6.23	6.10	0.93	1.26	2.66
18:1	9.72	0.64	3.31	10.74	11.74	20.28	1.09	60.75
18:2	2.30	0.17	3.85	4.65	1.38	1.29	2.04	1.64
18:3	11.85	1.04	39.12	3.08	3.39	19.04	19.81	—

**Abbreviations.** MGDG) monoglycosyldiacylglycerol; SQDG) sulfoquinovosyldiacylglycerol; DGDG) diglycosyldiacylglycerol.

For *Potamogeton* sp. it was found that the main lipids were glycolipids, amounting to 43.2% (or 17.1 mg/g dry weight), while neutral lipids amounted to 34.0% (13.5 mg/g dry weight), and phospholipids to 22.8% (9.0 mg/g dry weight). The main class of PLS was PC — 30.5%, the amounts of PE, PG, and PI being 22.2, 18.0, and 15.0%, respectively.

The fatty acid compositions of the various classes are given in Table 1. According to the results obtained, the composition of the fatty acids varied between the different classes of lipids and also between the fractions. Thus, in the individual glycolipids SQDG and DGDG the amounts of the 16:0 acid were 62.26 and 66.30%, respectively, while in the MGDG its amount was 8.51%. The differences between the classes of PLS were also fairly considerable: the amount of the 18:1 acid in the PC was 1.09%, and in the PE 60.75%; the amounts of the 18:3 acid in the PC was 19.81%, while none was found in the PE. For a total lipid extract the main fatty acids were: 16:0 — 61.80%; 18:3 — 11.85%; 18:1 — 9.72%; 16:1 — 6.32%; and 14:0 — 5.0%. The odd-numbered fatty acids iso-15:0 and 17:0 were found only in the classes of glycolipids.

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