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LIPIDS FROM *Rochelia cardiosephala* FRUIT

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In continuation of the study of lipids and lipophilic components of vegetative and generative plant organs, we studied previously uninvestigated lipids from *Rochelia cardiosephala* Bge. (Boraginaceae) fruit collected in Tashkent Oblast in 2008.

This family in Uzbekistan numbers 117 species [1] and is interesting because of the presence in fruit oils of triacylglycerides including ω-3 and ω-6 fatty acids, which are active metabolism regulators.

Total neutral lipids (NL) were isolated by extraction with hydrocarbons (bp 72–85°C) in a Soxhlet apparatus. Bound lipids were isolated from the defatted material by the Folch method [2].

Column chromatography over silica gel with elution by $CHCl_3$ was used to separate a part of the NL that accompanied the fraction of bound lipids. The recovered amount was combined with the NL extracted by hydrocarbons so that the overall yield of NL was 14.35%; bound lipids, 1.11%.

Phospholipids (PL) were eluted from the column by MeOH; glycolipids (GL), by acetone. Yield of GL, 0.79%; of PL, 0.42%.

Analysis of NL by TLC (silica gel) using hexane:Et_2O (4:1 and 1:1) showed that the principal components were triacylglycerides (TAG), hydrocarbons, free fatty acids (FFA), and aliphatic alcohols.

GL were separated by TLC on silica gel [3]. The principal classes of them were sterylglycosides, sterylglycoside esters, and mono- and digalactosyldiglycerides.

Two-dimensional chromatography on silica gel [3] was used to establish the PL composition. Phosphatidylcholines, phosphatidylethanolamines, phosphatidylinosites, and phosphatidic acid were detected.

Fatty acids of NL, GL, and PL were isolated and identified using literature methods [4, 5]. Table 1 presents the results.

We can be seen that the qualitative composition of fatty acids from NL and PL included 14 components; from GL, 10. Palmitic dominated the saturated acids; octadecenoic and octadecadienoic, the unsaturated acids. Polyunsaturated fatty acids occurred in the NL (17.3%), GL (4.2%), and PL (3.2%).

Neutral lipids consisted mostly (87.3%) of unsaturated fatty acids with 33.5% in the GL and 50.7% in the PL.

Next unsaponified compounds (UC), the yield of which was 4.4%, were isolated from the total lipids.

Total UC were separated from the fraction by preparative TLC on silica gel using hexane:Et_2O (6:4). The yield was determined gravimetrically. Hydrocarbons (8.0 mass%), triterpenols + aliphatic alcohols (24.1), sterols (41.8), tocopherols (9.0), and unidentified components (17.1) were detected.

The results indicated that the UC contained a significant quantity of biologically active compounds.

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TABLE 1. Fatty-Acid Composition of Lipids from *Rochelia cardiosephala* Fruit, GLC, mass %

Acid	NL	GL	PL	Acid	NL	GL	PL
12:0	–	1.1	1.3	20:0	2.0	6.2	0.1
14:0	0.1	4.3	1.1	20:1 (+18:4)	2.5	–	1.1
16:0	8.0	45.9	41.6	22:0	0.4	1.2	0.2
16:1	0.2	–	–	22:1	1.6	–	0.4
18:0	2.1	7.8	4.8	24:0	0.1	–	0.2
18:1	46.5	19.9	30.5	24:1	0.5	–	0.2
18:2	18.7	9.4	15.3	$\Sigma_{sat.}$	**12.7**	**66.5**	**49.3**
18:3 (6,9,12) **(ω-6)**	**3.6**	**2.4**	**1.7**	$\Sigma_{unsat.}$	**87.3**	**33.5**	**50.7**
18:3(9,12,15) **(ω-3)**	**13.7**	**1.8**	**1.5**				

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