

NEUTRAL LIPIDS OF *Citrullus vulgaris* SEEDSM. M. Rakhimov,<sup>b</sup> T. A. Aliev,<sup>b</sup> and I. Tolibaev<sup>a</sup>

UDC 547.953:665.37

The qualitative and quantitative compositions of the neutral lipids of watermelon seeds have been studied. The fatty acid compositions of the acyl-containing lipids have been determined. In the triacylglycerols the main forms are those in which the sn-2 position is substituted by linoleic acid.

The seeds of watermelon *Citrullus vulgaris* Schrad. (fam. Cucurbitaceae, variety Mramornyi) grown in Tashkent province have been investigated [1].

The lipids were extracted from the seed kernels by steeping in hexane. After evaporation of the solvent, the hexane extract consisted of a light yellow oil; yield 42%. The oil content of the seeds was 37.6%, and the unsaponifiables content 0.82% [2]. By TLC (Silufol, solvent systems 1-3) with the aid of model specimens of plant lipids and also of characteristic color reactions of individual compounds, the following classes of compounds were detected in the hexane extract, % by weight: hydrocarbons, 0.1; sterol and triterpenol esters, 0.9; triacylglycerols (TAGs), 94.6; free fatty acids, 2.4; triterpene alcohols, 0.7; sterols, 0.8; diacylglycerols (DAGs), 0.3; monoacylglycerols (MAG), 0.2.

In the products of the severe acid hydrolysis of the sterol and triterpenol esters we detected sterols and triterpenols by TLC. To evaluate the acyl-containing classes of lipids, we determined their fatty acid compositions (Table 1). In all the acyl-containing classes, among the saturated acids palmitic predominated. Unsaturated acids were represented mainly by oleic and linoleic acids, with the latter predominating in all the lipid fractions. On comparing the results on the fatty acid composition of seeds of the Mramornyi variety of watermelon with those in the literature [3] differences were observed in the relative amounts of some acids. This is possibly connected with various features of the plant under investigation, of the growth site, and of the conditions of agrotechnical treatment.

TABLE 1. Fatty Acid Compositions of the Acyl-containing Neutral Lipids of Watermelon Seeds, % by Weight

Fatty acid	Sum of the NLS	Sterol and triterpenol esters	FFAs	TAGs		DAGs	MAGs
				total	sn-2		
12:0	1.0	2.0	0.6	1.0	—	1.0	2.5
14:0	1.0	2.7	1.0	1.0	0.9	1.2	5.4
16:0	30.7	41.5	23.5	31.3	2.7	43.1	45.3
16:1	4.4	4.2	1.8	3.9	1.3	3.7	1.8
18:0	7.0	8.9	16.4	8.5	—	15.4	10.8
18:1	22.3	24.5	18.7	20.4	15.1	11.8	10.6
18:2	33.2	12.0	36.6	33.9	80.0	23.8	23.6
18:3	0.4	4.2	1.4	Tr.	Tr.	Tr.	Tr.
ES	39.7	55.1	41.5	41.8	3.6	60.7	64.0
EU	60.3	44.9	58.5	58.2	96.4	39.3	36.0

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To determine the nature of the FAs in the central positions of the TAGs we used the method of lipase hydrolysis. The TAGs were hydrolyzed with the aid of pancreatic lipase. The compositions of the sn-2-MAGs are given in Table 1. These results led to the conclusion that the central position of the TAGs was esterified mainly (80%) by linoleic acid.

## EXPERIMENTAL

For TLC we used Silufol and silica gel 5/40 mm from Chemapol (Czechoslovakia). The spots of the NLs were revealed with iodine vapor and by spraying with 50% sulfuric acid followed by heating to 120°C for 2-3 min. Column chromatography was conducted on Chemapol silica gel 100/160  $\mu\text{m}$  at a ratio of total NLs to adsorbent of 1:20.

Solvent systems: 1) hexane–ether–acetic acid (70:30:1); 2) heptane–methyl ethyl ketone–acetic acid (43:7:1); 3) hexane–ether (3:2) and (9:1).

GLC was conducted on a Chrom-4 instrument with a flame-ionization detector. Stainless steel column, 4 mm  $\times$  2.5 m filled with 17% PEGS on Celite 545, temperature 198°C. The saponification of the NLs and their individual components was carried out as described in [4], and the pancreatic lipolysis of the TAGs as in [5].

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