Chemistry of Natural Compounds, Vol. 47, No. 2, May, 2011 [*Russian original No. 2, March-April, 2011*]

LIPIDS FROM THE CHLOROFORM:METHANOL EXTRACT OF *Allium sativum*

N. K. Olimov* **and S. N. Aminov**

UDC 547.915

Garlic (*Allium sativum* L., Alliaceae) is widely used in folk medicine to treat various diseases. From this viewpoint, it is definitely interesting as a raw material source for drug production.

Some of the biologically active components of garlic are lipids, which play an integral role in the metabolism of living organisms.

We studied previously [1] the fatty-acid composition of the alcohol (I) and aqueous (II) extracts of garlic. The principal acids of both extracts were palmitic (I, 28.6%; II, 32.0), oleic (11.3 and 25.3), and linoleic (38.3 and 9.7). In addition, the aqueous extract contained a large quantity of stearic acid (16.3%). Furthermore, a rather high percentage of octadecatrienoic acid was found in both extracts, 4.0 and 5.6%, respectively.

Polyunsaturated acids are known to have a positive influence on liver function and exhibit hypocholesterolemic and cytostatic activity [2, 3]. Therefore, we considered it advisable to study more thoroughly the fatty-acid composition. For this, we used a $CHCl_3$:MeOH mixture (2:1, v/v) as the solvent. This enabled total lipids to be isolated more completely. We studied garlic grown in Tashkent Oblast.

Garlic cloves (52.9% moisture) were dried in a drying chamber at 60–65°C, ground, and soaked (3×) for 8 h in the aforementioned solvent mixture. The yield of extract was 0.6%.

The resulting extract was washed with aqueous $CaCl_2$ (0.04%) to remove nonlipid components. The solvents were distilled off. The extract was separated into neutral (NL), glyco- (GL), and phospholipids (PL) using column chromatography over silica gel. NL were eluted by $CHCl_3$; GL, acetone; PL, MeOH. Their yields were 59.2% (NL), 25.9 (GL), and 14.9 (PL) of the total mass.

The solvents were removed. The resulting lipid fractions were hydrolyzed by methanolic KOH (10%) with refluxing on a boiling-water bath for 1 h. The resulting potassium soaps were decomposed by H_2SO_4 solution (10%). The released fatty acids were extracted by Et_2O (3×). The resulting extracts were washed with distilled H_2O until neutral and dried over anhydrous Na_2SO_4. The Et_2O was distilled off. The fatty acids were methylated by diazomethane that was prepared as before [4].

Fatty acids of NL, GL, and PL were analyzed on a Chrom-5 instrument with a flame-ionization detector, steel column (2.5 m × 4 mm) packed with Chromaton N-AW with 15% Reoplex 400, column temperature 192°C, N_2 and H_2 carrier gases at 30 mL/min. Table 1 presents the fatty acid composition.

The principal saturated acid in NL, PL, and GL was palmitic at 10.9, 29.8, and 34.5%, respectively. Linoleic (65.8, 46.6, and 39.8%) and oleic (12.8, 12.7, and 14.3%) dominated the unsaturated acids. The highest content was observed in the NL. A significant amount of essential fatty acids (18:2 and 18:3) could not be found in garlic lipids. These are required for humans because they are acquired only in consumed food and belong to ω-6 and ω-3 acid classes [5].

Tashkent Pharmaceutical Institute, 700015, Tahskent, ul. Abaya, 45, fax: 256 45 04, e-mail: pharm@bcc.com.uz.

Translated from Khimiya Prirodnykh Soedinenii, No. 2, p. 246, March–April, 2011. Original article submitted April 16, 2010.

 0009-3130/11/4702-0270

TABLE 1. Fatty-Acid Composition of NL, GL, and PL of *A. sativum*, GC, mass%

Acid	Content			Acid	Content		
	NL	GL	PL		NL	GL	PL
12:0	0.2	0.4	0.4	18:0	1.3	3.1	2.2
14:0	0.8	1.2	1.1	18:1	12.8	14.3	12.7
16:0	10.9	34.5	29.8	18:2	65.8	38.9	46.6
16:1	0.4	1.1	0.7	18:3	7.8	6.5	6.5

REFERENCES

1. A. S. Normuradov, S. N. Aminov, and N. K. Olimov, *Farm. Zh.*, 4 (2005).
2. D. V. Ioffe, *Khim. Prir. Soedin.*, 275 (1984).
3. E. P. Bobkova and I. S. Ezhokova, *Kardiologiya*, No. 3, 440 (1970).
4. L. F. Fieser and M. Fieser, *Reagents for Organic Synthesis*, Wiley, New York, 1967.
5. V. N. Grigor′eva and A. N. Lisitsyn, *Maslo-Zhir. Promst.*, No. 4, 16 (2002).