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LIPIDS FROM TWO *Cicer* SPECIES GROWING IN CHINA

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Plants of the *Cicer* L. genus belong to the Fabaceae family [1]. Some plants of this family, e.g., soybean, bean, mung bean, chick-pea, and others are industrially cultivated. *Cicer* (chick-pea) is used to prepare dietary protein concentrate, vegetable oil, flour, etc. [2].

We studied lipids from two seed samples of *Cicer mediterraneum* (Kabuli) I and *C. asiatecum* (Desi) II cultivated in Xinjiang-Uigur Autonomous Region (China). The moisture content of I was 8.2%; of II, 7.9%. Neutral lipids (NL) were isolated by extraction with hydrocarbons (75-80°C) from previsouly ground seeds. The yield of lipids was 3.76% from I; 3.64%, from II calculated for absolute dry raw material. Total polar lipids (PL) were extracted from the remaining pulp by the Folch method [3]. Then, PL were separated into glycolipids (GL) and phospholipids (PhL) by column chromatography over silica gel. The NL were eluted by $CHCl_3$; GL, acetone; PhL, CH_3OH. The GL content with pigments was 0.24 and 0.18%; PhL, 0.44 and 0.45% from I and II, respectively.

Classes of each group of lipids were identified by TLC on silica gel using specific reagents and model compounds.

Classes of NL were determined using the solvent systems hexane:diethylether (1:4 and 1:1). Spots of compounds were developed by spraying plates with aqueous H_2SO_4 (50%) followed by heating. The NL contained hydrocarbons including carotinoids, esters of aliphatic alcohols and sterols with fatty acids, and triacylglycerides, which made up the bulk of the NL, free fatty acids, free sterols and aliphatic alcohols, and small amounts of oxygenated triacylglycerides. The carotinoid content in the NL was determined by spectrophotometry [4]. It was 30.6 for I; 28.0 mg% for II. Total GL were separated using $CHCl_3$:$(CH_3)_2CO$:CH_3OH:CH_3CO_2H:H_2O (65:20:10:10:3). Spots of compounds were developed using α-naphthol and perchloric acid [3].

The analysis showed that the main class of GL in both samples was sterolglycosides. The smallest fraction consisted of esters of sterolglycosides and monogalactosyldiglycerides. Furthermore, digalactosyldiglycerides and cerebrosides were detected. The PhL composition was determined using two-dimensional TLC and $CHCl_3$:CH_3OH:NH_4OH (13:7:1) and $CHCl_3$:CH_3OH:CH_3CO_2H:$(CH_3)_2CO$:H_2O (10:5:2:4:1). Spots of compounds were developed using ninhydrin solution and Vaskovskii and Dragendorff's reagents [3]. PhL of both samples contain mainly three components that could be placed in the following order depending on their content: phosphatidylcholines > phosphatidylethanolamines > phosphatidylinosides. Furthermore, sample I contained traces of *N*-acyllysophosphatidylethanolamines, *N*-acylphosphatidylethanolamines, and phosphatidic acids.

Table 1 gives the composition of fatty acids of NL and PL as determined by GC. Lipids were hydrolyzed and fatty acids were isolated and methylated as before [5].

Table 1 shows that differences were observed in the content of individual fatty acids although the compositions of the fatty acids of the NL and PL were very similar for the two samples. The PL had an elevated content of 16:0 and a slightly reduced fraction of 18:1 acids. The main acid of all lipid classes was 18:2.

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TABLE 1. Fatty Acids of Lipids from *Cicer mediterraneum* I and *C. asiatecum* II, GC, mass %

Acid	NL		PL	
	I	II	I	II
12:0	0.1	0.2	0.5	0.2
14:0	0.2	0.2	0.5	0.3
15:0	0.2	0.1	0.7	0.4
16:0	10.0	10.6	15.7	14.5
16:1	0.6	0.5	1.2	0.4
18:0	1.3	1.3	1.9	1.6
18:1	27.6	21.5	19.9	18.8
18:2	56.5	60.2	56.9	59.8
18:3	3.5	5.4	2.7	4.0
20:0	Tr.	Tr.	-	-
$\Sigma_{sat.}$	11.8	12.4	19.3	17.0
$\Sigma_{unsat.}$	88.2	87.6	80.7	83.0

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