PHOSPHONOLIPIDS OF KENAF SEEDS

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Phosphonolipids are widely distributed in marine animals (various species of sea anenome, crabs, molluscs, oysters, etc., and in the majority of lower animal organisms [1], and they have been detected in the lipids of the cardiac and skeletal muscles [2], in some strains of bacteria [3], in egg yolk [4], and in the lipids of sheep and goat brains [5], and also in apricot stones [6].

At the present time it is known that two types of phosphonolipids are found in nature: type A — diacyl-sn-glycerol-3-phosphonates; and type B — ceramide phosphonates [1].

We have investigated the total phospholipids of the seeds of kenaf (*Hibiscus cannabinus* L.), variety 1574, 1983 harvest, for the presence of phosphonolipids. On a two-dimensional chromatogram of the total phospholipids Dittmer's reagent [7] revealed nine blue spots. Of them six were known phospholipids: PC, lyso-PC, PI, PE, n-acyl-PE, and N-acyllyso-PE. Three compounds appeared in trace amounts. When the plates were heated at 100°C for 15 minutes, the spots of the phospholipids became brown and those of the minor components pale blue, which is characteristic for phosphonolipids. On one-dimensional chromatography in the methanol—water (2:1) system [8], the combined phospholipids of the kenaf seeds separated into two fractions: all the phospholipids remained at the start, and a weak spot extended in the form of a tail in the zone R_f 0.7-0.9 and in some cases even below, which is also characteristic for phosphonolipids. The total material was separated into phospholipids and phosphonolipids by preparative TLC. The IR spectrum of the phosphonolipid fraction, unlike that of the phospholipid fraction, contained an absorption band at 735 cm^{-1} which is characteristic for the P—C bond. According to their IR spectra, the phosphonolipids of kenaf belong to Type A [9, 10]. The fatty acids of the combined phospholipids (freed preparatively from their phosphono analogs) and of the phosphonoplipids were isolated by cold saponification. The results of the GLC analysis of the fatty acid methyl esters are given below:

Class of lipids	Fatty acids												
	10:0	12:0	14:0	16:0	16:1	17:0	17:1	18:0	18:1	18:2	18:3	ΣS	ΣU
Total phospholipids	1,7	2,1	3,7	17,5	5,0	5,9	2,8	6,0	30,8	21,6	2,9	36,9	63,1
Total phosphonolipids	—	1,0	0,8	11,6	2,0	Tr.	—	Tr.	55,9	21,7	6,2	13,4	86,6

In their fatty acid compositions, the lipids of these classes differed sharply. The difference between the samples with respect to the qualitative and quantitative amounts of the saturated acids was more pronounced. In the case of the phospholipid fractions, the amount of these acids was 36.9%, while in the phosphonolipids it was 13.4%, i.e., little more than one third. In the combined phospholipids the amount of the 17:0 acid was 5.9%, that of the 17.1 acid 2.8%, and that of the 18.0 acid 6%, while in the case of the phosphonolipids the 17:1 acid was completely absent and the 17:0 and 18:0 acids were present in trace amounts.

Attention is also attracted by the considerable amount of 18:1 acid in the combined phosphonolipids. On the basis of the results obtained, it may be assumed that the phosphonolipids fulfil some specific role in the vital activity of the cell membranes.

Thus, phosphonolipids have been detected for the first time in kenaf seed lipids and their fatty acid composition has been established.

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COUMARINS FROM *Stellera chamaejasme*

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Furocoumarins [1], flavonoids [2], and biflavanones [3] have been isolated previously from the roots of *Stellera chamaejasme* L., family *Thymelaeaceae*. We have investigated the epigeal part of this plant collected in the flowering period in Dauria (Chita province).

The air-dry herbage (1.3 kg) has twice extracted with water—methanol (1:1). The coumarins were extracted from the resulting solution, after its concentration, with chloroform. The material from the chloroform extract (10.8 g) was chromatographed on a column of silica gel with chloroform to which methanol was added in gradient fashion. On further purification by chromatography and crystallization, substances (I-III) were obtained in the individual form.

Substance I — $C_9H_6O_3$, mp 229°C (methanol), M^+ 162.

Substance II — $C_{19}H_{12}O_7$, mp 246-247°C (ethanol—chloroform), M^+ 352.

Substance III — $C_9H_6O_4$, mp 254-255°C (acetone), M^+ 178.

With the aid of UV, IR, and PMR spectroscopy and comparison with literature information [4-6], substances (I) and (III) were identified as the coumarins umbelliferone and daphnetin, respectively, and substance (II) as the dicoumarin daphnoretin. In the identification of daphnoretin we used, in addition, the results of elementary analysis and prepared daphnoretin methyl ether with mp 232°C (ethanol).

Scopoletin was identified by chromatography on paper impregnated with formamide—acetone (1:3) in chloroform in comparison with an authentic sample.

The coumarins mentioned above were also isolated from the roots of *S. chamaejasme*. This is the first time that any of the compounds identified have been found in this plant.

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