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# LIPIDS OF THE EELGRASSES *Zostera nana* AND *Zostera marina*

V. M. Dembitskii and O. A. Rozentsvet

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The lipids of eelgrasses have been little studied. There are only a few publications devoted to the investigation of the fatty acids and lipids of eelgrasses from various regions of the world oceans [1-4].

We have investigated the phospholipid and fatty acid composition of two species of eelgrasses of the Black Sea, *Zostera nana* and *Zostera marina*. The plants were collected in the region of the Karadag biostation in July, 1987, from a depth of 3-10 m.

The extraction of the lipids and the isolation and quantitative determination of the phospholipids and fatty acids were carried out by a known method [4, 5]. The fatty acids were identified with the use of chromato-mass spectrometry as described previously [6].

TABLE 1. Compositions of the Fatty Acids (GLC, wt. %) and Phospholipids of Total Lipid Extracts from the Eelgrasses *Zostera nana* and *Zostera marina*

Fatty acid	<i>Zostera nana</i>	<i>Zostera marina</i>	Phospholipids, % of the total lipid phosphorus	<i>Zostera nana</i>	<i>Zostera marina</i>
14:0	1,1	0,9	Phosphatidylglycerol	15,5	13,9
16:0	19,6	17,2	Phosphatidylethanolamine	24,3	23,9
16:1	11,4	1,3	Phosphatidylcholine	45,1	43,1
16:2 $\omega$ 6	2,2	0,5	Phosphatidylinositol	10,3	12,2
16:4 $\omega$ 3	9,8	1,1	Phosphatidylserine	4,8	6,9
18:0	4,2	1,8	Phospholipids, % of the total lipids	27,8	24,3
18:1 $\omega$ 9	13,7	10,3	Amount of total lipids, mg/g crude weight	5,3	7,1
18:2 $\omega$ 6	5,1	12,8			
18:3 $\omega$ 3	12,1	35,9			
18:4 $\omega$ 3	10,7	2,5			
20:4 $\omega$ 6	2,0	0,6			
20:5 $\omega$ 3	4,6	13,7			
22:5 $\omega$ 3	2,5	0,5			
22:6 $\omega$ 3	1,0	0,9			

Thus, the eelgrass species investigated differed with respect to their fatty acid compositions: For *Zostera nana* the main fatty acids were identified as the 16:0, 16:1, 18:1, 18:3, and 18:4 varieties, and for *Zostera marina* 16:0, 18:1, 18:2, 18:3, and 20:5. The main phospholipids were phosphatidylcholine and phosphatidylethanolamine, their amounts in the two species being approximately the same.

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## COUMARINS OF *Helichrysum maracandicum*

M. A. Baimukhamedov and N. F. Komissarenko

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A study of the flavonoids of the epigeal part of Samarkand everlasting, *Helichrysum maracandicum* M. Pop. ex. Kirp., family Asteraceae, has been reported previously [1].

We have investigated the coumarin composition of this plant. The coumarins were isolated by a procedure described previously [2, 3]. The comminuted raw material collected in the flowering period (0.5 kg) was extracted with a tenfold amount of 80% ethanol and the extract was worked up as described in [2, 3]. This gave 51 mg of substance (I) ( $C_{10}H_8O_3$ , mp 185-187°C, 163 mg of (II) ( $C_{10}H_8O_3$ , mp 204-205°C), 38 mg of (III) ( $C_9H_6O_3$ , mp 228-230°C), and 34 mg of (IV) ( $C_9H_6O_4$ , mp 268-272°C). The substances were identified by a comparison of physicochemical properties, by their transformation products, and through their UV and IR spectra as isoscopoletin, scopoletin, umbelliferone and esculetin, respectively [2-5].

This is the first time that any of the coumarins described above have been isolated from Samarkand everlasting.

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All-Union Scientific-Research Institute of Drug Chemistry and Technology, Kharkov.  
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