

A similar distribution of the acids has been reported by other authors [3].

After extraction with hexane, the samples of the OD and KF were steeped in chloroform-methanol. The following phospholipids were detected in the lipids of the OD and KF by TLC on silica gel in the solvent system described previously [4]: phosphatidylethanolamine, phosphatidylcholine, phosphatidylinositol, and lysophosphatidyl choline.

Thus, the oil-bearing dust formed in the processing of cotton seeds is a valuable waste which can be used together with the total mass of kernels for the extraction of oil.

#### LITERATURE CITED

1. S. I. Tabak, USSR Inventor's Certificate No. 1,033,163; Byull. Izobret, No. 29, 1 (1983).
2. S. D. Gusakova, S. G. Yunusova, T. V. Chernenko, I. P. Nazarova, and A. I. Glushenkova, Khim. Priir. Soedin., 677 (1986).
3. G. A. Stepanenko, T. V. Khomova, S. D. Gusakova, and A. U. Umarov, Khim. Priir. Soedin., 443 (1981).
4. T. V. Chernenko, M. Talipova, A. I. Glushenkova, A. U. Umarov, and D. Rakhimov, Khim. Priir. Soedin., 435 (1983).

#### LIPIDS OF *Rumex confertus*

T. V. Khomova, S. D. Gusakova,  
and A. I. Glushenkova

UDC 633.88:581.19:665.12

Plants of the genus *Rumex* (family Polygonaceae) are widely used in folk medicine for the treatment of dermal, gastrointestinal, and oncological diseases and are a valuable raw material for the leather industry [1]. The lipids of *Rumex* fruits have scarcely been investigated.

We have studied the lipids of the fruit of *R. confertus* Willd., which is widely distributed in Central Asia and is promising for introduction into cultivation.

The yield of hexane-extracted lipids from the comminuted amounted to 1.5% on the mass of the air-dried raw material.

The sum of the lipids was separated by chromatography on a column of silica gel [2] into the following fractions (% on the mass): hydrocarbons, 3.2; sterol esters (SEs), 14.0; wax esters (WEs) +  $x_1$ , 9.4; triacylglycerols (TAGs), 41.4; free fatty acids (FFAs) with anthraquinones (A-1) and  $x_2$ , 19.6; fatty alcohols, 0.4; diacylglycerols (DAGs) with anthraquinones (A-2) and sterols, 4.4; chlorophylls with  $x_3$ , traces; monoacylglycerols (MAGs) with  $x_4$ , 1.4; brown pigments, 6.2.

The lipids were identified as described in [2, 3]. The brown-pigment fraction gave a negative reaction for the presence of polar lipids, while A-1 had a pink and A-2 had a yellow coloration. The change in their coloration under the action of alcoholic solutions of KOH and  $Mg(OAc)_2$ , together with the presence of characteristic absorption bands in the UV spectrum [4], permitted the pigments to be assigned to the hydroxylated anthraquinones. It is known that the fruit this *Rumex* species contains chrysophanol and chrysophanein [1].

The low level of TAGs and the high level of hydrocarbons, SEs and WEs showed that the lipids isolated from the fruit of the *R. confertus* were a mixture of the surface lipids of the fruit coats and the reserve lipids of the seeds.

According to the results of TLC and IR spectroscopy, the hydrocarbons were paraffin and consisted (GLC, % [3]) of  $C_{16}$  -  $C_{18}$  - tr;  $C_{19}$  - 0.3;  $C_{20}$  - 0.2;  $C_{21}$  - 0.5;  $C_{22}$  - 0.1;

---

Institute of the Chemistry of Plant Substances, Uzbek SSR Academy of Sciences, Tashkent. Translated from Khimiya Prirodnikh Soedinenii, No. 2, pp. 284-285, March-April, 1989. Original article submitted July 4, 1988.

C<sub>23</sub> - 0.5; C<sub>24</sub> - 0.2; C<sub>25</sub> - 1.7; C<sub>26</sub> - 0.1; C<sub>27</sub> - 4.1; C<sub>28</sub> - 0.6; C<sub>29</sub> - 21.3; C<sub>30</sub> - 1.8;  
C<sub>31</sub> - 68.6; C<sub>32</sub> - tr.

The fatty acid compositions of the acyl-containing lipids [3] are given below:

Acid	SEs	WEs	TAGs	FFAs	DAGs	MAGs
12:0	0.1	Tr.	Tr.	Tr.	0.1	1.0
14:0	1.7	1.5		0.9	2.0	0.7
16:0	11.8	4.5	5.4	7.3	7.3	28.8
16:1	Tr.	Tr.	Tr.	Tr.	Tr.	5.5
18:0	2.4	2.6	0.8	0.8	1.6	5.1
18:1	28.2	8.2	36.9	30.3	33.5	30.9
18:2	48.1	3.4	52.9	44.7	53.2	26.7
18:3	Tr.	Tr.	Tr.	Tr.	2.7	Tr.
20:0	5.9	5.5	1.9	3.7	Tr.	Tr.
22:0	1.9	16.0	2.1	12.3	—	—
24:0	—	40.4	—	—	—	—
26:0	—	17.9	—	—	—	—
Σ sat	23.1	72.4	10.2	25.0	11.0	35.6
Σ unsat	76.9	27.6	89.8	75.0	89.0	64.4

Thus, the SEs and WEs of the fruit of *R. confertus* differ sharply from one another and from the other lipids by their acyl moieties. In five classes of lipids, apart from the WEs, the 18:2 and 18:1 acids predominated, while in the WEs it was the 24:0, 26:0, and 22:0 acids.

#### LITERATURE CITED

1. The Plant Resources of the USSR: Flowering Plants, Their Chemical Composition and Use [in Russian], Nauka, Leningrad (1985), pp. 277-290.
2. S. G. Yunusova, I. P. Nazarova, S. D. Gusakova, and A. I. Glushenkova, Khim. Prir. Soedin., 319 (1980).
3. T. V. Khomova, S. D. Gusakova, A. I. Glushenkova, and A. P. Shlyapinkova, Khim. Prir. Soedin., 707 (1984).
4. N. P. Mishchenko, L. S. Stepanenko, O. E. Krivoshchekova, and O. B. Maksimov, Khim. Prir. Soedin., 160 (1980).