BRIEF COMMUNICATIONS

FATTY ACID COMPOSITION OF VARIOUS BALSAMS AND ROSINS

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The present paper gives the results of a study of the nature of the fatty acids (f. a.) isolated from the balsam and extraction and tar-oil rosins of Pinus silvestris L. (Scotch pine), from the balsam and extraction rosin of Pinus sibirica R. Mayr (Siberian pine), and from the balsam of Larix sibirica Ldb. (Siberian larch). None of this information is in the literature.

The fatty acids were isolated by a known method [1], but to esterify them we used 1–4% solutions of sulfuric acid in methanol and repeated esterification for purification.

The methyl esters of the f. a. were analyzed at 200° C in a KhV-2 chromatograph with a thermal conductivity detector. The column (3000 × 4 mm) was filled with deactivated [2] INZ-600 brick impregnated with 20% ethylene glycol adipate. The rate of flow of hydrogen was 110 ml/min.

The f. a. esters were identified by the addition of authentic pure substances and from their relative retention times RRT [2, 3], and also by the use of the linear dependence of the logarithms of the RRT of f. a. esters on the number of carbon atoms in their molecules [4].

We can see from the table that the balsams and rosins contain f. a. 's with 11 to 22 carbon atoms. Unsaturated f. a. 's, mainly oleic and linoleic acid, predominate in the rosins. The main saturated f. a. is palmitic acid.

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Content (%) of Fatty Acids in Their Mixtures Isolated from Balsams and Rosins

Acid	Code [2]	RRT	From the balsam of			From the rosin of		
			Scotch pine	Siberian pine	Siberian larch	Scotch pine		Siberian pine
						extraction	tall oil	extraction
X_1	—	0.105	4.8	5.5	0.2	—	0.2	—
Undecenoic	11 : 1	0.126	0.7	5.8	—	—	—	0.2
Lauric	12 : 0	0.153	1.3	7.5	0.5	—	—	—
11-Methyldodecanoic	iso -13 : 0	0.182	0.8	1.1	—	—	—	—
Tridecanoic	13 : 0	0.205	0.7	2.3	0.6	—	—	—
X_2	—	0.237	0.4	—	—	—	—	0.5
12-Methyltridecanoic	iso -14 : 0	0.263	—	—	1.1	—	—	—
Physeteric	$14 : 1^5$	0.316	1.2	2.3	1.5	0.2	—	0.1
13-Methyltetradecanoic	iso -15 : 0	0.330	1.6	—	—	—	—	—
12-Methyltetradecanoic	anti-iso -15 : 0	0.370	—	2.4	—	—	—	0.1
Pentadecanoic	15 : 0	0.386	1.3	—	2.3	0.1	—	—
13,13-Dimethyltetradecanoic	neo-16 : 0	0.419	0.7	0.9	0.6	—	—	—
14-Methylpentadecanoic	iso -16 : 0	0.459	5.6	1.6	—	—	—	—
X_3	—	0.507	—	0.7	—	—	1.6	0.4
Palmitic	16 : 0	0.550	6.5	14.1	10.2	4.0	5.0	5.7
Hexadec-7-enoic	$16 : 1^7$	0.611	2.5	—	1.6	0.5	—	—
Palmitoleic	$16 : 1^9$	0.623	—	4.6	—	—	2.0	—
X_4	—	0.678	2.1	0.9	2.4	1.8	2.8	3.0
Hexadeca-7,10-dienoic	$16 : 2^{7,10}$	0.750	1.4	0.8	—	—	—	—
Stearic	18 : 0	1.000	1.5	1.4	—	0.3	0.1	0.7
Oleic	$18 : 1^9$	1.115	14.2	11.7	14.4	27.4	49.1	23.8
Isooleic	iso -18 : 1	1.208	—	0.7	3.5	—	3.4	—
Linoleic	$18 : 2^{9,12}$	1.330	27.8	16.6	23.2	43.2	20.8	40.7
Octadeca-11,14-dienoic	$18 : 2^{11,14}$	1.422	13.5	9.1	25.8	10.6	4.5	11.8
γ-Linolenic	$18 : 3^{6,9,12}$	1.610	2.8	1.4	3.4	2.2	—	1.7
Linolenic	$18 : 3^{9,12,15}$	1.760	0.8	2.3	4.0	1.2	4.7	1.2
Octadeca-6,9,12,15-tetraenoic	$18 : 4^{6,9,12,15}$	1.962	—	—	—	0.8	—	1.1
Eicosa-8,11-dienoic	$20 : 2^{8,11}$	2.343	—	—	—	1.2	—	0.5
Eicosa-11,14-dienoic	$20 : 2^{11,14}$	2.506	4.7	6.3	4.7	5.9	4.8	7.6
Eicosa-8,11,14-trienoic	$20 : 3^{8,11,14}$	2.790	3.1	—	—	—	—	—
Behenic	22 : 0	3.240	—	—	—	0.6	1.0	0.9
Total f.a. (%) in the samples			0.4	0.3	0.4	5.8	7.2	4.8