

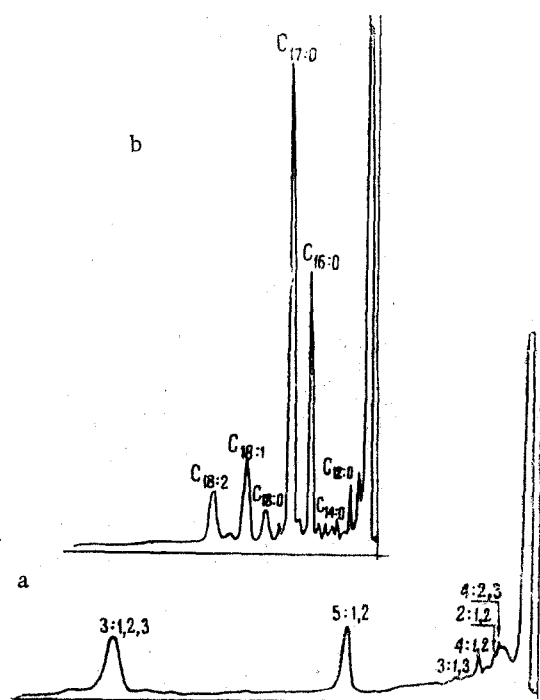
INVESTIGATION OF THE TRIGLYCERIDE FRACTION OF THE FATTY OIL OF HELLEBORUS ABCHASICUS

Ts. M. Dalakishvili and E. P. Kemertelidze

Khimiya Prirodnikh Soedinenii, Vol. 4, No. 5, pp. 312-313, 1968

From the epigeal parts of Helleborus abchasicus A. Br. we have obtained a biologically active fatty oil. Its TLC on silica gel in the petroleum ether-ether-acetic acid (84:15:1) system gave zones corresponding to hydrocarbons, sterol esters, triglycerides, free fatty acids, mono- and diglycerides, sterols, and phospholipids.

The fatty oils were separated into the groups mentioned on a column of silica gel. The triglycerides were eluted with ether-hexane (10:90). It is known that in chromatography on silica gel the diol lipids issue together with the triglycerides.



Gas-liquid chromatography of the polyols (a) and fatty acids (b) contained in the triglyceride fraction of the oil of Helleborus abchasicus.

The triglyceride fraction was subjected to acid methanolysis [1]. The methanolysis products were separated by preparative TLC on silica gel in the hexane-ether system (85:15). The methyl esters of the fatty acids (R_f 0.6) were eluted from the plate with ether and the alcohols (R_f 0.0) with methanol.

The alcohols-polyols-obtained in this way were acetylated with a solution of acetic anhydride in ethyl acetate in the presence of perchloric acid.

The acetates of the polyols were analyzed by GLC on a Khrom-2 instrument. 1,5-Pentanediol was added to the column as internal standard [2, 3]. As can be seen from the figure (a), the triglyceride fraction of the oil of Helleborus abchasicus contains, in addition to glycerol, which is the main component (1.4%) of this fraction, the diols ethylene glycol, 1,3-propanediol, and 1,2- and 2,3-butanediols. Of these only 1,2-butanediol is present in appreciable amount (0.1%). The methyl esters of the fatty acids obtained from the triglyceride fraction after its methanolysis were analyzed by GLC on a Khrom-1 instrument. Methyl margarate was used as internal standard. The results of the analyses are given in the figure (b).

Thus, it has been established that the triglyceride fraction of the oil studied contains the following fatty acids: lauric, 0.33%; myristic, 0.11%; palmitic, 3.65%; stearic, 0.66%; oleic, 1.65%; and linoleic, 1.21%. The other acids appear in the form of small peaks which were not identified.

REFERENCES

1. J. J. Rahm and R. T. Holman, J. Lipid, 5, 169, 1964.
2. V. A. Vaver, V. V. Dorogov, and L. D. Bergel'son, Izv. AN SSSR, 12, 2681, 1967.
3. V. A. Vaver, A. N. Ushakov, and L. D. Bergel'son, Izv. AN SSSR, 6, 1187, 1967; 8, 1647, 1967.

5 April 1968

Kutateladze Institute of Pharmacological
Chemistry AS Georgian SSR

UDC 547.915.3

THE OIL OF THE SEEDS OF MURETIA TRANSITORIA

L. A. Shustanova and A. L. Markman

Khimiya Prirodnikh Soedinenii, Vol. 4, No. 5, pp. 313-314, 1968

Muretia transitoria belongs to the family Umbelliferae [1]. The seeds of the plant contain 17% of an olive-green oil. The oil has not been described in the literature. According to our investigations, its specific gravity is d_4^{20} 0.9126, n_D^{20} 1.4711, and its absolute viscosity 0.665 (20° C). Saponification number 189.75; iodine number 100.62%; thiocyanogen number 82.05%. Content of unsaponifiables 1.4% and of phosphatides 0.22%. For the mixture of fatty acids from the oil we found the neutralization number 199.05 mg/g; the mean molecular weight 281.88; the iodine number 103.48%, and the thiocyanogen 84.69%. The total mixture of acids was separated by Twitchell's method into a solid and a liquid fraction (table).

Fatty acids	Yield, %	C _{16:0}	C _{16:1}	C _{18:1}	C _{18:2}
Total mixture	100	3.79	0.78	79.24	16.19
Liquid fraction	65.7	3.53	1.05	50.98	44.44
Solid fraction	34.3	5.37	—	94.63	—

Since petroselinic (6,7-octadecenoic) acid (mp 34° C) is present in the oil of many Umbelliferae it should of course be present in the solid fraction. For proof, this fraction was destructively oxidized by Hilditch's method [2]. Among the oxidation products in the monocarboxylic acid fraction we found 92.38% of lauric acid and in the dicarboxylic acid fraction 94.43% of adipic acid. This confirmed our assumption that the solid acid fraction consists mainly of petroselinic acid. Its content calculated on the oil is 32.46%. By oxidizing the petroselinic acid by Lapworth's method [3] we obtained 6,7-dihydroxystearic acid with mp 122.4° C, neutralization number 177.2, mol. wt. 316.59 (theoretical 316.57). The gas-liquid chromatography of the saturated acid fractions isolated by Bertrand's method permitted the detection in the oil of, besides palmitic acid, a small amount of other saturated acids from C₁₀ to C₂₂.

REFERENCES

1. Flora USSR, Moscow-Leningrad, 16, p. 415, 1950; Flora Uzbekistana, Tashkent, 4, p. 315, 1959.
2. T. P. Hilditch, J. Amer. Chem. Ind., 44, 43, 180, 1925; 48, 46, 1929; Chemical Constitution of Natural Fats, L., 322, 1940.
3. H. P. Kaufmann, Analyse der Fette und Fettprodukte, Springer-Verlag, Berlin, 1, 502, 1953.

18 March 1968

Institute of the Chemistry of Plant Substances AS UzSSR