

Index	Oil	Fatty acids	Index	Oil	Fatty acids
Density, g/ml	0.9236	—	Thiocyanogen no., % (I ₂)	78.01	83.18
Relative viscosity, °E	6.58	—	Acetyl no., mg KOH/g	19.06	—
Refractive index, n _D ²⁰	1.4840	—	Content, %		
Saponification no., mg KOH/g	190.67	—	Saturated acids	—	11.77
Neutralization no., mg KOH/g	—	198.28	Unsaponifiabiles	3.28	—
Mean mol. wt.	—	282.28	Phosphatedes	0.45	—
Iodine no., % (I ₂)	121.67	132.47	(as stearooleocithin)		

552 g/l, and the oil content 15.86%. The oil is red-brown in color; the physical and chemical properties of it and the fatty acids isolated from it are given in the table.

The fatty-acid composition of the oil was determined by gas-liquid chromatography with the following result: C_{10:0}—0.40; C_{12:0}—0.31; C_{14:0}—0.65; C_{16:0}—7.71; C_{17:0}—1.06; C_{18:0}—2.76; C_{16:1}—1.35; C_{18:1}—23.14; C_{18:2}—62.62%.

The glyceride composition was established by the method of enzymatic hydrolysis [3] with the following result, %: SSS) 0.18; SSU) 1.96; SUS) 2.25; SUU) 24.37; USU) 5.32; UUU) 65.92.

Three pigments were found in the oil by column chromatography, and these were identified spectrographically as α- and δ-carotenes and α-chlorophyll [4]. The unsaponifiabiles fractions yielded a crystalline sterol with mp 132° C.

In respect of its technical properties, the oil is of the semidrying type.

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COUMARINS OF THE ROOTS OF ANGELICA ADZHARICA

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Angelica adzharica M. Pimen (adzharian angelica) is a monocarpic Caucasian plant of the family Umbelliferae [1]. Its roots, collected in the flowering phase in 1965 (Arsian range, Eastern Adzharia), have been studied. They were shown by a photocolometric method [2, 3] to contain 2.87% of coumarins consisting of a mixture of at least four substances with R_f 0.00, 0.20, 0.90, and 0.94 [in the n-hexane-benzene-methanol (5:4:1) system; Leningrad type B paper impregnated with a 10% solution of formamide in methanol].

By chromatography on acid alumina with elution by means of petroleum ether, bp 70-100° C, we have isolated from a methanolic extract of the roots two acylated coumarins with the composition C₂₄H₂₆O₇, mp 170-172° C (from methanol), [α]_D¹⁹ -35° (c 0.96; chloroform), R_f 0.94, and C₁₈H₁₈O₇, in the amorphous state, [α]_D¹⁹ -18.2° (c 1.1; chloroform), R_f 0.90. From its IR spectrum and a mixed-melting-point test, the first coumarin was identified as anomalin; the second, judging from its physicochemical constants and NMR spectrum, is a new pyranocoumarin, and has been

called adzharin. The isolation of the acylated pyranocoumarins from Caucasian species of *Angelica* of the section *Angelicooides* [5, 6] and far-eastern species of the subsections *Anisopleura*, *Stenophyllum*, and *Angelophyllum* of the section *Callisaceae* [4, 7, 8] shows that they are close to one another biochemically.

Hydrolysis of the glycosidic fraction of the roots (3% HCl solution) gave dihydroseselin $C_{14}H_{14}O_3$, mp 104–106° C (from petroleum ether) and umbelliferone $C_9H_6O_3$, mp 228–229° C (from water), identified by their IR spectra and by mixed-melting-point tests. The presence of glucose in the hydrolysate was shown by paper chromatography with reference materials.

The formation of dihydroseselin under these conditions can be explained by the presence in the plant of an ostheno-glucoside, which loses the sugar residue on hydrolysis, and the resulting ostheno-ol then undergoes cyclization into dehydro-seselin [9]. Umbelliferone could be formed from one of its glycosides or from glycosides of p-hydroxycoumarinic acid.

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SCOPOLETIN FROM CENTAUREA MEYERIANA

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Centaurea meyeriana Tzvel. = *Ambyopogon meyeriana* (Tzvel.) Karjag. (Meyer's centaurea) is a perennial herbaceous plant of the family Compositae. The plant is endemic, being found only in the southeastern part of Azerbaidzhan.

From the epigeal part of this centaurea collected on May 21, 1968, near the settlement of Pirasor (Lerik region, Azerbaidzhan SSR) we have isolated by aqueous extraction [2] a crystalline substance with the composition $C_{10}H_8O_4$. Yield 0.15%, mp 203.5–205° C (from ethanol). IR spectrum, cm^{-1} : 3340 (OH), 1707 (C=O), 1630, 1610, 1570, 1515.

Alkaline aqueous and ethanolic solutions possess a blue fluorescence in daylight.

A mixed-melting-point test and a comparison of IR spectra has shown that the substance obtained is scopoletin [3].

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