

CHEMICAL COMPOSITION OF THE ACORNS OF *Quercus castaneifolia*

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The chestnutleaf oak *Quercus castaneifolia* C. A. Mey, family Fagaceae, is the main forest-forming species of Azerbaïdzhân, especially the Lenkoran'-Astara zone [1].

Various species of oak are used in folk medicine, as a raw material in the tanning of hides, in the production of starch, and as a fodder for cattle [1-3]. Every year the chestnutleaf oak bear fruit copiously, with a mean annual yield of acorns of 78,654 kg [average figures of Gosleskomitet Azerbaïdzhana (Azerbaïdzhân State Forestry Committee) over 1978-1991 for the Lenkoran'-Astara zone]; however, their chemical composition has not hitherto been studied. In view of this, we have investigated the chemical composition of acorns of this species of oak gathered in the botanical garden of the Institute of Botany, Azerbaïdzhân Academy of Sciences.

The acorns were freed from cupules, and they were dried, skinned, and ground. It was found that they consisted to the extent of 83.2% of kernel (cotyledon) and 16.8% of skin (on the crude mass of the acorns; moisture content 9.2%). The lipids were extracted with petroleum ether (bp 40-60°C) in a Soxhlet apparatus. The main physicochemical indices were determined by generally adopted procedures, and the fatty acid composition was studied by the method described by Fobe and Ponzhan* [4].

Lipid content†	
% on the dry raw material	6.1
Density, d^{20} , g/cm ³	0.9182
Refractive index, η^{20}	1.4738
Acid No., mg KOH/g	7.6
Saponification No.	193.7
Iodine No., % I ₂	112.7
Unsaponifiable substances	2.3
Fatty acids, %:	
18:1	60.1
18:2	8.4
18:3	17.8
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Σ saturated	13.7
Σ unsaturated	86.3

†Yellow-brown viscous liquid with a specific acorn odor.

*Simple transliterations of the Russian [versions of] the names: these authors have not been identified [Translator].

The defatted flour was dried, and the amounts of dry matter, sugars, titratable acidity, and pectin, tanning, and protein substances were determined by known methods [4]. The component compositions of these substances were determined by paper chromatography and, in particular, those of the fatty acids as described in [5], carbohydrates as in [6], amino acids as in [7], and pectin substances (after hydrolysis) as in [8]. The chemical composition of the acorns is given below:

Substance	Amount. % on the air-dry weight of the raw material	Component composition
Dry matter	7,0	
Sugars		
total	9,9	Glucose, galactose, traces of arabinose
invert	7,3	
sucrose	2,6	
Titratable acidity (as malic acid)	2,9	Citric, malic, succinic, and two unidentified acids
Pectin substances		
total	7,5	Glucuronic acid, glucose, galactose
soluble pectin	1,7	
protopectin	5,8	
Amino acids		Lysine, arginine, aspartic acid, glutamic acid, serine, glycine, threonine, alanine, tryptophan, isoleucine, leucine
Tanning substances	10,7	
Protein substances	5,1	

We are the first to have studied the chemical composition of the acorns of *Quercus castaneifolia* growing in Azerbaidzhan.

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