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Fatty acid composition and physicochemical constants of seed oil from *Rhus coriaria* L. distributed in Azerbaijan

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Abstract: The genus *Rhus* L. belonging to the Anacardiaceae family is represented by the only species *Rhus coriaria* L. in the flora of Azerbaijan, where it is known as sumac. The various organs of the plant have been used from ancient times for tanning leather, dyeing textiles, and for medicinal purposes. The fruits, rich in various biologically active substances, are widely used as flavorings for meat and fish dishes. In this work, the qualitative and quantitative composition of fatty acids, as well as the physicochemical characteristics and organoleptic properties of oil obtained from the seeds of sumac were studied. The chemical characterization was determined by HP 6890 series chromatograph with a flame ionization detector and 15 fatty acids were found. Their content ranged from 0.04% to 57.91%. The main compounds (97.56%) were linoleic (57.91%), oleic (29.14%), palmitic (7.34%) and stearic (3.17%) acids. To the best of our knowledge, myristic, eicosic, eicosatetrenic, arachidonic and heptadecanoic acids were detected for the first time in sumac seed oil. It was found that the fatty oil obtained from the seeds of *R. coriaria* L. has saponification number 192, 0.44% free fatty acids 0.44%, peroxide number 4.52, iodine number 128, weight fraction of phosphorus-containing substances equal to 303 mg/kg.

Keywords: *Anacardiaceae, free fatty acids, gas chromatography, seeds, peroxide number, saponification number, sumac*

INTRODUCTION

Rhus coriaria L., commonly known as sumac, from Anacardiaceae family is widely distributed in all geographical regions of Azerbaijan, from the lowland to the middle mountain belt along the edges of the forest, among shrubs, on stony and rocky places. Forms thickets and grows in groups [Batiha et al., 2022; Flora of Azerbaijan, 1961]. The plant is widely distributed throughout the world and is used in food, medical and other industries. [Khalil et al., 2021; Sakhr, Khatib, 2020].

The fruits of *R. coriaria* L. contain 20-25% tannins [Başoğlu, Cemeroğlu, 1984], flavonoids (mainly avicularin, astragalin, quercitrin, myricetin) [Plavan et al., 2010], anthocyanins (myritillin, chrysanthemin, cyanine, delphinidin) [Bashash et al., 2012; Plavan et al., 2010], gallic, benzoic, gallotanin [Bashash et al., 2012], caffeic [Al-Boushi, Hamdo, 2014] acids, essential oil [Brunke et al., 1993; Morshedloo et al., 2018], fatty oils [Doğan, Akgül, 2005], and minerals [Özcan, Hacisəfəroğullari, 2004]. Antioxidant [Gabr et al., 2014], antimutagenic [Rayne, Mazza, 2007], anti-ischemic [Zargham, Zargham, 2008], antidiabetic [Giancarlo et al., 2006], antibacterial [Abu-Shanab et al., 2005], antifungal [Viles et al., 1989] activities have been studied in the ethanolic and methanolic extracts obtained from leaves and fruits of sumac.

One of the important sources of essential fatty acids may be products of plant origin, in particular, oils extracted from seeds of wild and cultivated plants [Zeynalova, Novruzov, 2019]. Literature data about the content of fatty oils in the fruits and seeds of R. coriaria L. are scarce [Doğan, Akgül, 2005; Nayebpour, Asadi-Gharneh, 2019; Tyutyunnikov, 1992; Ünver, Özcan, 2010]. As it is well-known, vegetable oils are the main food components [Gladyshev, 2022; Triebold, Aurand, 1963], providing a person with such essential fatty acids as linoleic, linolenic and arachidic, which are not synthesized in the human body [Gladyshev, Sushchik, 2019; Ngoddy, Ihekoronye, 1967]. They are suitable as reactive diluents for coatings formulation in the production of drugs [Lombardi et al., 2021; Mozaffarian, Wu, 2012]. In this regard, the identification of oils with a high content of fatty acids belonging to the ῳ-2 class is currently very important. Given the gaps in the study of *R. coriaria* and the wide natural range of this plant in Azerbaijan, the aim of the work was to study the fatty

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acid composition, as well as the physicochemical and organoleptic characteristics of sumac seed oil.

MATERIAL AND METHODS

Plant material. 500 g of fruits were collected during the period of full ripeness (on September) from Siyazan district of Azerbaijan (49º00′14.454″E 41º04′45.468″ N). Air-dry seeds were dried again at 105°C temperature to residual moisture content of 8%.

Extraction. The dried seeds (250 g) were crushed and ground with a grinding mill. The oil extraction of the seeds was carried out by Soxhlet apparatus using n-hexane as a solvent, subsequently removed using a rotary evaporator (ROVA-N2L). Obtained fixed oils were analyzed by GC method after methylation process.

Gas cromatography. Preparation of the oil sample for analysis was carried out in accordance with GOST 31663-2012 [2012].

An HP 6890-series (Agilent Technologies Inc., Germany) gas chromatograph equipped with a FID (Flame Detector Ionization) was used to carry out the analyses. An Agilent 112-88A7 100 m capillary column was used for separation of the components. The temperature program was initially set at 140ºC for 5 min, then increased to 240ºC at 4ºC/min and finally held for 15 min (total run time 32 min). Hydrogen was used as the carrier gas at a rate of 1.5 mL/min. Wiley and MassFinder 3, Baser Library of Essential [ESO, 2000; Joulain, Konig, 1998; Koenig et al., 2004] was applied.

The identification of the total fatty acids was performed by comparison to the retention times presented by the chromatographic standard from C4:0 to C22:6n3 (SupelcoTM37 standard FAME Mix, Supelco Inc., Bellefonte, PA, USA). The relative amounts of the compounds, expressed as percentage values, were calculated in relation to the total area of the chromatogram by normalizing the peak area. All analyzes were performed in triplicate.

Physicochemical and organoleptic parameters. These parameters were determined according to standard methods (GOST 18848-73, GOST P 50457-92, GOST 5475-69, GOST 5478-2014, GOST P 52676-2006.

RESULTS AND DISCUSSION

As a result of gas-liquid chromatographic analyzes of methyl esters of fatty acids in the oil of *R. coriaria*, the presence of 15 fatty acids was established (Table 1). Based on the obtained data, the content of individual components varied from 0.04 to 57.91%.

Data from previous work showed that the oil content and its fatty acid composition were strongly different depending on the growing site. The content of free fatty acids in sumac from Turkey's Anatolia region included oleic (37.7%), linoleic (27.4%), palmitic (21.1%) and stearic (4.7%) acids [Kizil and Turk, 2010]. The yield of sumac oil collected in other Turkish locations ranged from 7.7% Hakkari) to 14.7% (Mut-Mersin). It contained a significant amount of linoleic acid (56.60–61.56%) [Matthaus, Özcan, 2015] confirming the results of Doğan and Akgül [2005], according to which the main fatty acids were oleic acid (from 34.00% to 40.35%), linoleic and linolenic acids (from 33.31% to 35.83%), and palmitic acid (from 20.75% to 25.60%). Polyunsaturated fatty acids (18:2 + 18:3) on the content of total fatty acids varied between 34.84% and 37.36%. According to Yilmaz et al. [2020], oleic (C18:1), linoleic (C18:2) and palmitic (C16:0) acids were also major fatty acids in sumac oil from samples of R. coriaria naturally distributed in Tunceli and Siirt provinces of Turkey. Their content varied respectively between 42.2% and 43.3%, 25.2% and 28.5%, 18.04% and 21.5%, while the total content of polyunsaturated fatty acids (18:2 + 18:3) ranged from 25.9% to 29.9%. Lastly, the oil percentage of wild Iranian sumac fruit ranged from 9.22% to 15.33%. It mainly contained unsaturated fatty acids (64.75%-74.08%), followed by saturated fatty acids (25.84%-35.13%). Among the latter, palmitic acid was the most abundant (21.36-29.79%) while among the unsaturated fatty acids, oleic (36.65-44.74%) and linoleic acids prevailed (22.62-33 .48%) [Nayebpour, Asadi-Gharneh, 2019].

In line with the cited studies, our results confirmed that linoleic (C18:2, 57.91%) and oleic (C18:1, 29.14%) acids were the most abundant fatty acids. The smallest amount falls on the share of other fatty acids: palmitic (C16:0, 7.34%), stearic (C18:0, 3.17%), linolenic acid (C18:3, 0.62%), eicosanoic or arachidic (C20:0, 0.22%), gadoline (C20:1, 0.34%), arachidonic (C20:4, 0.74%). Other acids have been found in trace amounts. To the best of our knowledge, myristic (C14:0), eicosanoic (C20:0), eicosatetraenoic or arachidonic acid (C20:4) and heptadecanoic (C17:0) acids were detected for the first time in *R. coriaria* seed oil.

It is known that polyunsaturated fatty acids help reduce total cholesterol levels, play a regulatory role in diseases of the cardiovascular system, atherosclerosis, and hypertension, and participate in the formation of a number of metabolic regulators and the structure of the plasma membrane [Abu-Shanab et al., 2005; Kaur et al., 2018; Patterson et al., 2012; Tyutyunnikov, 1992].

Table 1. Fatty acid composition of *Rhus coriaria* L. oil from seeds.

Identified fatty acids	Retention time, min	Content (%)
C14:0	15:35	0.04±0.18
C16:0	18:51	7.34±0.10
C16:1	19:49	0.13±0.01
C17:0	20:18	0.06±0.13
C17:1	21:09	0.04±0.17
C18:0	21:33	3.17±0.02
C18:1	22:55	0.06±0.10
C18:1	23:01	29.14±0.09
C18:2	23:59	0.07±0.03
C18:2	24:09	57.91±0.05
C18:3	25:47	0.62±0.02
C20:0	25:02	0.22±0.06
C20:1	25:57	0.34±0.09
C20:4	29:20	0.74±0.01
C24:0	31:21	0.05±0.17

Note: Values are reported as mean ± SD (n=3).

Linoleic acid which is the dominant fatty acid in our sample has protective properties and is a necessary component in the synthesis of ceramides [Kus-Yamashita et al., 2016]. It has been shown that diets with oleic acid are associated with a decreased risk of coronary heart disease, cardio-metabolic risk, obesity, type 2 diabetes and hypertension [Kris-Etherton et al., 1999; Lopez-Miranda et al., 2010]. Furthermore, the potential protective effects of oleic acid on the promotion and progression of several human cancers is suggested [Binukumar, Mathew, 2005].

To identify the area of uses and standardization of vegetable oil, it is very important to determine its physicochemical and organoleptic characteristics. Those of *R. coriaria* seed oil are presented in table 2.

From the data in table 2, it can be seen that the fatty oil from the seeds of *R. coriaria* has a saponification number of 192, an iodine number of 128, and a small amount of free fatty acids (0.44%). These indicators of oil are close to those of edible oils and it can be proposed for testing in food industry [Grigoryeva, Lysitsin 2002; Khalil et al., 2021]. A rather high saponification number indicates that the oil has a lower molecular weight than other edible oils. Peroxide value is an important indicator for determining the quality of the oil. Its low level in our sample indicates the correct extraction of oil and GC analysis, in addition to denoting the absence of oxidative decomposition.

The unsaturated fatty acids in R. coriaria seed oil account for almost more than 70% of the total amount of fatty acids. A sufficiently high content of linoleic acid, which is an essential fatty acid, makes the studied oil a valuable dietary product. All this allows us to recommend sumac oil as a dietary supplement for balancing cholesterol levels in the body, preventing diseases of the cardiovascular system, as a protector in

Table 2. Physicochemical and organoleptic characteristics of oil obtained from *Rhus coriaria* L. seeds.

Parameters	Unit of measurement	Results
Organoleptic parameters		Clear yellow liquid, odorless, taste characteristic of seeds
Color (Lovibond, ¼ inc.)	Red/yellow	1.7 Red, 20 yellow
Free fatty acids	%	0.44
Peroxide value	mmolO_2/kg	4.52
Iodine value	IV	127.55≈128
Saponification value	KOH	191.80≈192
Mass fraction of phosphorus-containing substances	mg/kg	303

the synthesis of ceramides, a group of compounds that make up the lipid barrier and skin hyperpigmentation caused by UV rays [Gladyshev, Sushchik, 2019].

In conclusion, physicochemical and organoleptic characteristics and fatty acid composition of R. coriaria seed oil showed that it can be used as a drug in medicine and a biologically active additive in the production of food and cosmetic products.

REFERENCES

Abu-Reidah I. M., Jamous R. M., Ali-Shtay M.S. (....) Phytochemistry, Pharmacological Properties and Industrial Applications of *Rhus coriaria* L. (Sumac). *JJBS*, 7(4): 233–244.

Abu-Shanab B., Adwan G., Abu-Safiya D., Adwan K., Abu-Shanab M. (2005) Antibacterial activity of Rhus coriaria L. extracts growing in Palestine. *Journal of The Islamic University of Gaza (Natural Sciences Series)*, 13(2):147-153.

Al-Boushi M.A., Hamdo H. (2014) Herbali extaction and study of the phenolic compounds in the leaves and sticks of Syrian sumac plant (*Rhus coriaria* L.). *Int. J. Chemtech Res.*, 6(4): 2414–2420.

Bashash M., Bolandi M., Zamindar N. (2012) Phenolic content of selected sumac fruits from Iran. Extracted with different solvents. *J. Chem. Health Risks*, 2(4): 17–20.

Başoğlu F., Cemeroğlu B. (1984) Research on the chemical composition of sumac. *Food*, 167-172. [Başoğlu F., Cemeroğlu B. (1984) Sumak'ın kimyasal bileşimi üzerine araştırma. Gıda, 167–172]

Batiha G.E., Ogunyemi O.M., Shaheen H.M., Kutu F.R., Olaiya C.O., Sabatier J.M., De Waard M. (2022) *Rhus coriaria* L. (Sumac), a versatile and resourceful food spice with cornucopia of polyphenols. *Molecules*, 27: 5179. doi: 10.3390/molecules27165179

Brunke E.J., Hammerschmidt F.J., Schamus G., Akul A. (1993) The essential oil of *Rhus coriaria* L. fruits. *Flavour Fragr J*, 209–214.

Doğan M., Akgül A. (2005) Characteristics and fatty acid compositions of *Rhus coriaria* cultivars from Southeast Turkey. *Chem Nat Compd*, 724–725.

ESO 2000. (1999) The complete database of essential oils. Boelens Aroma Chemical Information Service. The Netherlands.

Flora of Azerbaijan (1961) Baku, 4: 152–155. [Флора Азербайджана (1961) Баку, 4: 152–155]

Gabr S.A., El-Metwallo M.M., Al-Chadir A.H. (2014) Antioxidant activity and antibacterial tituentsof sumac (*Rhus coriaria* L.). *Biotechnology*, 13: 37–45.

Giancarlo S., Rosa L.M. Nadijafi F., Francesco M. (2006) Hypoglycaemic activity of two spices extracts: *Rhus coriaria* L. and *Bunium persicum* Boiss. Nat. Prod. Res., 20: 882–886.

Gladyshev M.I. (2022) Fatty Acids: Essential Nutrients and Important Biomarkers. *Biomolecules*, 12: 1250. https://doi.org/10.3390/ biom12091250

Gladyshev M.I., Sushchik N.N. (2019) Long-chain omega-3 polyunsaturated fatty acids in natural ecosystems and the human diet: Assumptions and Challenges. *Biomolecules*, 9: 485.

GOST 31663-2012 "Vegetable oils and animal fats. Determination of the mass fraction of methyl esters of fatty acids by gas chromatography. [ГОСТ 31663-2012 «Масла растительные и жиры животные. Определение методом газовой хроматографии массовой доли метиловых эфиров жирных кислот»]

Grigoryeva V.N., Lysitsin A.N. (2002) Factors determining the biological value of vegetable fats. *Oil and fat industry*, 4: 14–17. [Григорьева В.Н., Лысицин А.Н. (2002) Факторы, определяющие биологическую ценность растительных жиров. *Масложировая промышленность*, 4: 14–17] https://doi.org/10.1016/j.indcrop.2017.10.002

Joulain D., Konig W.A. (1998) The atlas of spectral data of sesquiterpene hydrocarbons. *J. Nat. Prod.*, 62, 1212–1213.

Kaur K.K., Allahbadia G., Singh M. (2018) Synthesis and functional significance of Poly Unsaturated Fatty Acids (PUFA's) in Body. *ASNH*, 2(4): 43–50.

Khalil M., Hayek S., Khalil N., Serale N., Vergani L., Calasso M., De Angelis M., Portincasa P. (2021) Role of Sumac (*Rhus coriaria* L.) in the management of metabolic syndrome and related disorders: Focus on NAFLD-atherosclerosis interplay. *JFF*, 87: 104811

Kizil S., Turk M. (2010) Microelement contents and fatty acid compositions of *Rhus coriaria* L. and *Pistacia terebinthus* L. fruits spread commonly in the south eastern Anatolia region of Turkey. *Nat Prod Res.*, 24(1): 92–8. doi: 10.1080/14786410903132555

Koenig W.A., Joulain D., Hochmuth D.H. (2004) Terpenoids and related constituents of essential oils. Mass Finder 3. In: Hochmuth DH, ed. Convenient and Rapid Analysis of GC MS, Hamburg, Germany, pp, 493.

Kris-Etherton P.M., Pearson T.A., Wan Y., Hargrove R.L., Moriarty K., Fishell V., Etherton T.D. (1999) High-monounsaturated fatty acid diets lower both plasma cholesterol and triacylglycerol concentrations. *Am J*

Clin Nutr., 70(6): 1009–15.

Kus-Yamashita M.M.M., Filho J.M., Mcdonald B., Ravacci G., Rogero M.M., Santos R.D., Waitzberg D., Reyes M.S., Yehuda S., Gierke J., Cori H., Pires T., Lajolo F.M. (2016) Poly unsaturated Fatty Acids: health impacts. *EJFNS*, 6(3): 111–131.

Lombardi, M., Carbone, S., Del Buono, M.G. (2021) Omega-3 fatty acids supplementation and risk of atrial fibrillation: an updated meta-analysis of randomized controlled trials. *Eur Heart J Cardiovasc Pharmacother*, 7: e69–e70.

Lopez-Miranda J., Perez-Jimenez F., Ros E., De Caterina R., Badimon L., Covas M.I., Escrich E., Ordovas J.M., Soriguer F., Abia R. (2008) Olive oil and health: summary of the II international conference on olive oil and health consensus report, Jaen and Cordoba (Spain). *Nutr Metab Cardiovasc Dis.*, 20(4): 284–94.

Matthaus B., Özcan M.M. (2015) Fatty acid composition, tocopherol, and sterol contents of sumac (*Rhus coriaria* L.) fruit oils. *Eur J Lipid Sci Technol.*, 117(8): 1301–1302. doi:10.1002/ejlt.201400547

Morshedloo M.R., Maggi F., Neko H.T., Aghdam M.S. (2018) Sumac (*Rhus coriaria* L.) fruit: essential oil variability in Iranian populations. *Ind Crops Prod*, 111: 1–7.

Mozaffarian D., Wu J.H. (2012) (n-3) fatty acids and cardiovascular health: are effects of EPA and DHA shared or complementary. *J Nutr*, 142: 614–625.

Nayebpour N., Asadi-Gharneh H. (2019) Variability of fatty acids composition of wild sumac (*Rhus coriaria* L.) *Fruit. J. Med. Plants*, 18(71): 118–129. 10.29252/jmp.3.71.118

Ngoddy P.O., Ihekoronye A. (1967) Integrated food, science and technology for the tropics. Baileys Industrial Oil and Fat Product 3 rd ed. USA, Swern, p. 1103.

Özcan M., Hacisəfəroğullari H. (2004) A condiment [sumac (*Rhus coriaria* L.) fruits]: some physico-chemical properties. *J. Plant Physiol*., 30(3-4): 3–4.

Patterson E., Wall R., Fitzgerald G.F., Ross R.P., Stanton C. (2012) Health implications of high dietary omega-6 polyunsaturated fatty acids. *J Nutr Metab*, ID 539426: 1–16. DOI: 101155/2012/539426

Plavan V., Barsukov V., Kovtunenko O. (2010) Sumac application for vegetable tanning Iimprovement. International Conferenceon Advanced Materials and Systems, 3rd, pp.101–106.

Rayne S., Mazza G. (2007) Biological activities of extracts from sumac (*Rhus* spp.). *Plant Foods Hum. Nutr.*, 62: 165–175.

Sakhr K., El Khatib S. (2020) Physiochemical properties and medicinal, nutritional and industrial applications of Lebanese Sumac (Syrian Sumac – *Rhus coriaria*): A review. *Heliyon*, 6: e03207. doi: 10.1016/j.heliyon.2020.e0320

Triebold H.O., Aurand L.W. (1963) Food Composition and Analysis// D. Van Nostrand CO. Inc. Princeton N. J. USA, p. 497.

Tyutyunnikov B.N. (1992) Chemistry of fats. Moscow, 447. [Тютюнников Б.Н. (1992) Химия жиров. Москва, 447 с.]

Ünver A., Özcan M.M. (2010) Fatty acid composition of seed and pericarp of sumach (*Rhus coriaria* L.) grown wild in different regions of Turkey. *JAFE,* 8(1): 31–33.

Viles R. O. Gottenbos J.J., Robblen G., Downey R.K. (1989) Nutritional characteristics and food uses of vegetable oils. Oil crops of the world. Mc. Graw Hill, New York, USA, p. 36

Yilmaz G., Eksi G., Demirci B., Demirci F. (2020) Chemical characterization of the fatty acid compositions and antimicrobial activity of sumac (*Rhus coriaria* L.) fruits, growing naturally in Turkey and sold in herbalist markets. *J. Fac. Pharm. Ankara*, 44(1): 61–69.

Zargham H., Zargham R. (2008) Tannin extracted from sumac inhibits vascular smooth muscle cell migration. *McGill J Med.,* 11(2): 119–123.

Zeynalova A.M., Novruzov E.N. (2019) Fatty acids composition and physico-chemical constants of Punica granatum L. seed oil. *Khimiya Rastitel'nogo Syr'ya*, 4: 259–262.

Azərbaycanda yayılan *Rhus coriaria* L. toxum yağının yağ turşu tərkibi

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Azərbaycan florasında Sumaqkimilər fəsiləsinə aid olan *Rhus* L. cinsi bir növ - Aşı sumaq (*Rhus coriaria* L.) ilə təmsil olunur. Qədim zamanlardan bitkinin müxtəlif orqanlarından dərinin aşılanması, dərman məqsədləri və tekstilin rənglənməsi üçün istifadə edilir. Meyvələr müxtəlif bioloji fəal maddələrlə zəngindir, onlardan ət və balıq üçün dadlandırıcı kimi geniş istifadə olunur. Aşı sumaq növünün toxumlarından alınan yağın yağ turşularının keyfiyyət və kəmiyyət tərkibi, fiziki-kimyəvi xüsusiyyətləri tədqiq edilmişdir. Yağ turşularının metil efirlərinin keyfiyyət və kəmiyyət tərkibi alov ionlaşma detektoru olan HP 6890 seriyalı xromatoqrafdan istifadə etməklə müəyyən edilmişdir. Xromatoqrafik tədqiqatlar nəticəsində yağın tərkibində 15 yağ turşusunun olması müəyyən olunmuşdur. Yağın tərkibindəki ayrı-ayrı yağ turşularının miqdarı ümumi miqdarın 0.04%-dən 57.91%-ə qədər dəyişilir. Yağ turşularının əsas hissəsini (97,56%) palmitik (7.34%), olein (29.14%), stearin (3.17%) və linolen (57.91%) turşuları təşkil edir. Yağ turşularından ilk dəfə olaraq sumaq yağı üçün miristik, eikoz, palmitik, eikosatetren, araxidon və heptadekanoik turşuları müəyyən edilmişdir. Yağın fiziki-kimyəvi xüsusiyyətlərini öyrənərkən məlum olmuşdur ki, Rhus coriaria L. toxumundan alınan yağ aşağıdakı göstəricilərə malikdir: sabunlaşma ədədi - 192, sərbəst yağ turşularının miqdarı - 0,44%, peroksidin sayı - 4.52, yod sayı - 128, fosfor tərkibli maddələrin çəki payı - 303 - mq /kq.

Açar sözlər: *Anacardiaceae, sərbəst yağ turşuları, qaz xromatoqrafiya, toxum, yağ turşuları, peroksid ədədi, sabunlaşma ədədi, sumax*

Жирнокислотный состав масла семян *Rhus coriaria* L. распространяемого в азербайджане

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Род *Rhus* L.,относящийся к семейству Сумаховые во флоре Азербайджана представлен одним видом - Сумах дубильный (*Rhus coriaria* L.). Различные органы издревне использовались для дубления кожи, окрашивания текстильных изделий в лечебных целях. Плоды богаты различными биологически активными веществами, которые широко используются в качестве вкусовых добавок к мясу и рыбе. Изучен качественный состав и количественное содержание жирных кислот и физико-химические характеристики масел полученных из семян сумаха дубильного. Качественный состав и количественное содержание метиловых эфиров жирных кислот определяли на хроматографе «HP» 6890 series с пламенно-ионизационным детектором. В результате хроматографического исследования было установлено, что масло содержит 15 жирных кислот. Содержание отдельных жирных кислот в масле изменилось от 0.04 до 57.91% от общей суммы. Основную часть (97.56%) жирных кислот составляют пальмитиновая (7.34%), олеиновая (29.14%), стеариновая (3.17%) и линолевая (57.91%) кислоты. Из жирных кислот миристиновая, эйкозиновая, пальмитиновая, эйкозатетреновая, арахидоновая и гептадекановая кислоты для масла сумаха установлены впервые. При изучении физико-химической характеристики масла было установлено, что жирное масло, полученное из семян *Rhus coriaria* L. имеет следующие показатели: число омыления192, количество свободных жирных кислот 0.44%, пероксидное число 4.52, йодное число 128, весовая доля фосфорсодержащих веществ 303 мг/кг..

Ключевые слова: *Rhus coriaria L., семена, жирное масло, хроматография, жирные кислоты, физико-химические константы*