



Chemical Composition *Acorus Calamus* L.

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Abstract. In this article, the information on the chemical composition of the prospective medicinal plant *Acorus calamus* in Uzbekistan is presented. There are 2 species belonging to the genus *Acorus* L., and the species *Acorus calamus* L. is found in Uzbekistan. The plant contains bitter acorin glycoside, 25% starch, tar, alkaloids and flavoring substances, tannins, up to 150% vitamin C and vitamin B. The composition of the essential oil includes pinene, camphene, camphor, merneol, eugelol, azarone, guaene, selinene, acorone, roazilene and other substances.

Key words: *Acorus calamus*, medicinal features, chemical composition, rhizomes.

Acorus calamus L. It is a medicinal plant belonging to the Araceae family, which has 107 genera and 1080 species worldwide, 110 genera and 1050 species in tropical countries, 7 genera and 13 species in the European part of the former USSR, and 3 genera and 5 species in Central Asia. There are 2 species belonging to the genus *Acorus* L., and the most common species is *Acorus calamus* L. They grow in rivers, lakes, wetlands, ponds and ponds. *Acorus calamus* L. plant is found in the European part of the former USSR, Siberia, the Far East, Yakutia, the Caucasus, Central Asia and Kazakhstan [1], [2], [3], [4], [5].

The chemical composition of the plant has been widely studied by world scientists [6], [7]. Some literary sources say that *Acorus calamus* L. contains 4.3-4.5% essential oil [6], [7], F.W. Semmler and K.E. Spotnitz [8] reported 4.6%, H.Kholmatov and in O'.A. Ahmedov [9], up to 5% essential oil is mentioned. In addition, calameon [6], [7], (+)-camphor, d-calamen, b-calamen, calamon, acoroxide, acorone, isoacorone [10], [13], [14], [15], Calamenol, δ -cadinene, selinene, caryophyllene, humulene, guaiene, isocalamendiol, calacone, β -myrcene, (+)-calamusenone, tropon, (-) cadalatriene-1,4,9 [1], [2], [3], There are compounds such as [4], [13], [14], [15]. Igir contains aromatic substances: 6.6%-azarone, 1.25%-eugenol and parazarone [13], [14], [15], 82% β -azarone, azoryl aldehyde, methyleugenol; aliphatic aldehyde, 4,7-decadienol, N-heptane, palmitin; from sesquiterpenoids: acogermacron, acolamon, isoacolamon, shiobunone, episibunon, isosiobunone; of nitrogenous substances: choline, 0.048% coumirin, 3.25% lutein are present [11], [12], [16], [17], [18].

1.35-5.8% essential oil is in rhizome; 80% of azarone, α -azarone β -azarone, pinene, camorene, sesquiterpenes: acorenone, episibunone, isoshiobunone, nitrogenous substances: 0.26% choline, carbohydrates: 0.2% maltose, 20.7% glucose, fructose [11], [12], [15], [17], from alicyclic substances: 4,10-dimethyl-7 isopropylbicyclo (4,4,0)decadiene-1,4, cespino (4,5) decenone, ketones, alcohols and their derivatives: propanaldiethylacetal, hexanol, pentanaldiethylacetal, hexanaldiethylacetal, octanon-3, heptanol-1, heptanol-2,6-methylhepten-5-one-2, octen-1-ol-3,3,7-dimethylcadmen-1, 5-diol-3,7, organic acids and their derivatives: oil, valerian, capron, caparin, ethyl isobutyrate, from terpenes: trans-2-ethoxy-2 (10)-pinene, 4 ethoxy-1-n - menthene, endo -



The Peerian Journal

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Volume 19, June, 2023.

Website: www.peerianjournal.com

ISSN (E): 2788-0303

Email: editor@peerianjournal.com

isocamphanone, carvenone, n-mentadien-1 (7), 2-ol-8, selinadienol, from terpenoids: α -pinene, camphene, 5% camphor, borneol, calamene, β -pinene, calamine, calamol, calamenol, azulene, 1.2% myristin, 18.2% palmitin, 16.4% palmitolein, 7.3% stearin, 29.1% olein, 24.5% linoleic, 3.2% arachin, α -tuien, sabinene, myrcene, α -terpene, limonene, ceneol, cis-ocimene, trans-ocimene, ν -terpinene, allocimene, n-cymol, terpinolene, phenxone, trans-oxide linalool, cis-oxide linalool, menthone, δ -elemene, α -copaene, 1,7-diepicedrene, α -guryunene, menthylacetane, α -transbergamotene, camphenhydrate, β -gurnonene, β -elemene, terpineol-4, β -caryophyllene, xotrienol, mental, α -humulene, α -acoradiene, β -acoradiene, trans-pinocarvilacetate, viridiflorene, α -terpineol, α -selinene, δ -selinene, carvone, piperiton, ν -acoradiene, δ -cadinene, β -sesquiphellandrene, n-cymen-8-ol, α -curcumene, 6-episiobunon, 2,6-diepisiobunon, shiobunone, isoshiobunone, ν -eudesmol, trans-nerolidol, guayenol, isospatulenol, calamusenone, acorenone, δ -cadinol, 10- α -cadinol, 10-epi- α -cadinol, torreiol, guaiazulene, humulenol-11, hydroxycalamenene, isocalamendiol, preizcalamendiol, calamendiol, oplopanone, acarone, isoacorone, from aromatic substances: b -77.68% azorone, 6, 8% α -azrone [13], [14], [15], [16], [17] 4-methyleneispropylbenzene, trans-anethole, methyl ether of cisisoeugenol, methyl ether of transisoeugenol, ν -azarone, 4-isopropyl, 6-methyl - 1,2,3,4-tetrahydronaphthalen-1-one; 2,4,5-trimethoxy phenylacetone, azarone aldehyde; 2,4,5-trimethoxypropiofenone; heterocyclic substances: 2-pentylfuron, 2-furaldehyde; acetic acid, methyl ester 2-hydroxy-3-methylvaleric acid, palmitic, heptane; aliphatic alcohols, octen-1-ol-3, sesquiterpenes: acorgermacrone, prenzolamendiol, steroids: sitosterol, acetophenone, benzyl alcohol, 2-phenylethanol, 1-(2,4,5-trimethoxyphenyl)-1-ethoxyproic-2, acoradine, 2,4,5-trimethoxybenzaldehyde [17], [18], [19], (2,4,5-trimethoxyphenyl)-2-propenal, quinones: 2,5-dimethoxy-benzoquinone, heterocyclics: 2,3-dihydro-4,5,7-trimethoxy-1-ethyl-2-oethyl-3-(2,4,5-trimeoxy-phenyl) indene, Y-butyro-lactone, 2-vinyl-2-methyltetra-hydrofuranone – S is present. In the books "Kormovye rasteniya senokosov i pastbishch SSSR" [21] by I.V. Larin and other authors and "Lekarstvennye rasteniya SSSR i ix primenenie" [22] by A.D. Turova, the medicinal properties of the rhizome of *Acorus calamus* L. are at a high level in its composition noting that it depends on chemical substances, the raw rhizome contains the following amounts: 11.41% water, 5.32% nitrogen substances, 2.46% essential oil, 5.75% oil, 6.73% sugar substances, 34.08% starch, 12.41% pectin, 6.48% cellulose, 4.40% ash, 0.28% sand; in the purified rhizome: 1.25% water, 5.39% nitrogenous substances, 2.12 essential oil, 3.02% fat, 6.52% sugars, 45.39% starch, 8.98% pentose, 4.26 % fiber, 0.03-2.90% ash. According to I.E. Akopov [23], the plant contains up to 20% starch.

The essential oil of different varieties of *Acorus calamus* L. contains up to 75% β -azarone. Triploid and tetraploid varieties have been found to contain up to 90% β -azarone. *Acorus calamus* var. *americanus* RAF. and β -azarone is not found in the diploid variety. The rhizome of *Acorus calamus* L. contains bitter acorin and lucenione glycoside, which are characteristic of this plant. Azarin aldehyde gives a unique aroma. Some literature reports that the essential oil found in the root of the plant contains: δ -cadinene, thymol, α -azarone, ν -azarone, azarone aldehyde, myristic acid [16], [17], [18].

The leaves contain 0.66-2.5% essential oil, flavoring agents, 130mg to 150mg per 100g vitamin C, vitamin B, 1% pinet, 7% camphor, 10% calamen, 8.7% d-camphor, 3% borneol, acaron, isasecoron, eugonol, azaron, proizulenacorin, 20% starch, choline, tar and other substances. The flower contains 0.04% essential oil, additives [16], [17], [18].



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