

COMPOSITION OF BIOLOGICALLY ACTIVE COMPOUNDS IN APIUM GRAVEOLENE PLANT EXTRACT

Tursunbayev Husayn Khabibullo oqli

Namangan State University Faculty of Natural Sciences

Chemistry (by types) 2nd stage student

<https://doi.org/10.5281/zenodo.10897959>

Abstract. This article describes the qualitative analysis of the chemical composition of *Apium graveolen*.

Keywords: *Apium graveolen*, 3-n-butyl-4, 5-dihydrophthalide, palmitic acid, linolenic acid, stearic acid, linoleic acid, petroselenic acid, saponin, tannin, flavonoid.

Today human health is gaining importance in every field. Therefore, the need for medicinal plants is increasing day by day. Medicinal plants *Apium graveolen* is an impressively aromatic plant that is widely used as a herb. This plant is rich in essential oil, its seeds can be used in food, aromatherapy, as a spice in soups, salads, and as a cocktail mix. The most important components responsible for the flavor in the seed oil are sedanenolide (3-n-butyl-4, 5-dihydrophthalide), sedanolide and 3-n-butyl phthalide. Therefore, celery seed oil is the most important for use in the fragrance and flavor industry. The oleoresins of this plant include fixed oil, artefacts, resins, volatile oils and waxes. The total amount of volatile oil present in oleoresins acts as an indicator of quality. Oleoresins are used as fixatives for volatile compounds, and the resin portion of the oleoresin does not contain any flavoring components. However, other parts of oleoresins contain components responsible for the aroma. The most important components of *Apium graveolene* oil are 3-n-butyl phthalide, sedanolide, sedanonic anhydride, and sedanenolide, which are present in very low concentrations and usually cause the aroma. This oil contains a number of phthalide derivatives and its seed extracts are used in food products such as meat products, snack foods, condiments, puddings, candies, dairy desserts, soups, alcoholic beverages, relishes, gravies widely used as a flavoring agent. gelatins.

Chemical composition: *Apium graveolen* is also known as a rich source of vitamin C and other minerals. Its seeds contain volatile oil, proteins, crude fiber, moisture, starch, ash, carbohydrates and solid fats.

Fatty acids include oleic acid, palmitic acid, linolenic acid, stearic acid, linoleic acid, and petroselenic acid. This plant is a source of minerals such as calcium, magnesium, potassium, and contains a high concentration of sodium. One cup of chopped *Apium graveolen* leaves contains almost 100 mg of sodium. The essential oil consists of sesquiterpenes, limonene and a characteristic aroma. It is a rich source of folic acid, potassium, sodium, fiber, β -carotene, magnesium, silica and chlorophyll.

Phytochemistry: *Apium graveolen* has a characteristic aromatic smell due to the essential oil and volatile compounds mainly confined to the green leaves of the plant. The aromatic volatile oils of the leaves consist mainly of terpenes, phenols and anhydrides. Oils obtained from seeds are called solid oils and consist mainly of fatty acids. Plants contain alkaloids and steroids in addition to essential oils or solid oils. The seed extract contains steroids, glycosides, flavonoids and carbohydrates. Furocoumarins are also present in plant extracts, including other components such as apigrarine, isopimpinellin, apiumoside, celerine, apiumetin, isoimperatorin, bergapten, and

celereoside. Phenols such as apigenin, tannins, quercetin, folic acid and graveobioside are also present.

Results and discussions. Based on the above data, we performed a qualitative analysis of the biologically active compounds of the plant *Apium graveolen*.

Apium graveolen plant: The presence of the following biologically active compounds in extractives was determined using qualitative reactions.

Apium graveolen, which we are researching from the plant for qualitative analysis - aqueous extract and extracts of water-alcohol mixtures at different concentrations were obtained. With the resulting extracts Qualitative reactions were conducted based on literature data. The chromatographic method for the determination of the presence of flavonoid compounds in extracts prepared from plants has been widely used.

We prepared alcoholic extracts from the plant for chromatographic analysis. For this purpose, 2 g of crushed leaves of *Apium graveolen* plant were placed in a 50 ml flask and 20 ml of alcohol was poured over it. An upright cooler was installed in the flask and boiled for 10 min in a water bath. After cooling, the extract was filtered through a paper filter. 0.1 ml of the filtrate and alcohol solution of "witness" flavonoids were dropped on the start line of the "Silufol" plate using a capillary tube or a special dropper at a distance of 2 cm from each other and dried in air. Then the plate was placed in a chromatographic column filled with n-butanol-acetic acid - water (4:1:5 ratio) or 15% solution of acetic acid and chromatographed for 30-40 minutes. Then the plate was removed, air-dried and viewed under UV light, the spots were detected (flavonoids are precipitated in brown, yellow, golden color).

Apium graveolens plant biologically active compounds contained in the extract composition (flavonoids, the results of tests conducted on tannins, saponins and alkaloids) are presented in table 1.

Table 1.

***Apium graveolens* plant results of qualitative determination of the group of biologically active compounds contained in the extract**

Quality reaction type	The result of the reaction	Extrogen			
		Water	40% Alcohol	70% alcohol	96% alcohol
<i>Flavonoids</i>					
<i>Iron (III)-chloride solution</i>	<i>Formation of black-green color</i>	+	+	++	++
<i>HCl conc. and heating Zn powder</i>	<i>Red color solution</i>	+	+	++	++
<i>Heating with ammonia</i>	<i>Golden yellow color</i>	+	+	++	++
		<i>Flavone, the predominance of flavonones</i>			
<i>With a 10% solution of alkali</i>	<i>With the formation of a yellow color</i>	++	++	++	++
<i>Tannin substances</i>					
<i>With protein solution</i>	<i>Formation of turbidity</i>	+++	++	++	+

<i>With iron ammonium aluminate</i>	<i>Formation of black-green color</i>	+++	++	++	+
<i>Saponins</i>					
<i>Foaming</i>	<i>Stable and abundant foaming</i>	++	+++	+++	+++
<i>HCl and NaOH in test tubes</i>	<i>Foam formation</i>	<i>Continuous foaming in both tubes</i> <i>Triterpene saponins</i>			

Note: The number of the "+" sign indicates the intensity of the staining, the height of the precipitate and the foam.

Summary. Thus, qualitative reactions are based on results and Phenolic substances in *Apium graveolen* plant extract : flavonoids, saponins, tannins and alkaloids was found to exist.

REFERENCES

1. R. Chopra, P. De. (1929). *Saussurea lappa* (Kut Root) in Pharmacology and Therapeutics. Indian Journal of Medical Research. 17(2): 351-359.
2. S. Nasri, M. RAMEZANI, N. Yasa. (2009). Antinociceptive and anti-inflammatory effects of hydroalcoholic extract of *Apium graveolens*
3. Vinarsky, V. Chromatography: Course lecture v 2 ch. CH.1. Gas chromatography / VA Vinarsky. - Minsk: BGU, 2002. - 192 p
4. Physico-chemical method analysis: v 3 ch. CH.3. Chromatograficheskie method analysis: ucheb. posobie dlya studentsov zaочноy formi obucheniya / IN Dmitrevich[i dr.]. - SPB: GTURP, 2014. - 53 p