DETERMINATION OF MACRO AND MICRO ELEMENTS IN THE ROOT FRUIT SAMPLE OF CYPERUS ROTUNDUS PLANT BY AVIO 200 (ICP-OEC) OPTIC EMISSION SPECTROMETRIC METHOD

Makhbubakhon Yigitaliyeva Anvarjon

Intern-researcher
Kokand State Pedagogical Institute Uzbekistan
yigitaliyevamaxbuba@gmail.com 99-996-87-05, 95-086-19-09
https://doi.org/10.5281/zenodo.10841314

Abstract

General information about the Cyperus rotundus plant grown in Furqat district of Fergana region and the elemental composition of its rhizomes were studied in AVIO 200 ISP - OES inductively coupled plasma optical emission spectrometer (Perkin Elmer, USA). The presence of about 30 types of macro and micro elements in the rhizome of this plant has been determined, and the conclusions are given.

Key words: Cyperus rotundus, root fruit, macro and micro elements, potassium, phosphorus, sulfur, magnesium, AVIO 200 ISP - OES, Optical emission spectrometer.

Cyperus rotundus is a perennial plant. Its rhizomes look a little like walnuts, although botanically they are not related to walnuts. Other

As in the Cyperaceae family, the leaves grow from the base of the plant in three rows, about 5–20 cm (2–8 in) long. [1]. The flower stem has a triangular cross-section. The flower is bisexual with three stamina and three stigma lozenges, the inflorescence has three to eight unequal spikes. The fruit is triangular. Young plants initially form white, fleshy rhizomes in chains up to 25 mm in size. Salomalikum was used as an aromatic and water purifier in ancient Egypt, Myenian Greece and elsewhere [3]. It was used as both medicine and perfume by the ancient Greek physicians Theophrastus, Pliny the Elder and Dioscorides. It prefers dry conditions, but tolerates wet soils and often grows in desert and cropland. [2]. Roots have been cooked since ancient times, they are used in folk medicine to treat heart failure, etc. Salomalikum rhizome contains 0.5-0.6% essential oil, smells of camphor. Salomalikum is the main regulating herb in traditional Chinese medicine [4].

Cyperus rotundus rhizome sample is taken in analytical balance (FA220 4N) in the amount of 100 g to prepare aqueous extract for analysis, i.e. to dissolve minerals. Transfer the sample to a 1-liter container and pour distilled water up to the mark of the container. The aqueous solution was shaken on a shaker for 2 hours and filtered without stirring.

For analysis, 5 ml of the filtered clear solution was taken, placed in a special 50 ml flask and diluted with distilled water to 50 ml. The solution in the flask is placed in special test tubes in the Autosampling Department for analysis. The prepared sample was analyzed in an AVIO 200 ISP - OES Inductively Coupled Plasma Optical Emission Spectrometer (Perkin Elmer, USA). The accuracy of the device is high, and it allows to measure the elements in the solution to an accuracy of 10-9 g.

The analysis of trace elements obtained as a result of the analysis is as follows:

Table 1.

In the sample Microelements	Li 670.784 (cps)	Mn 257.610 (cps)	Mo 202.031 (cps)	Te 214.281 (cps)	Se 196.026 (cps)
Amount (mg/10 g)	0,201	0,085	0,053	0,000	0,000
In the sample Microelements	Sb 206.836 (cps)	Sn 283.998 (cps)	Sr 407.771 (cps)	Ba 233.527 (cps)	Cr 267.716 (cps)
Amount (mg/10 g)	0,000	0,000	0,235	0,014	0,041
In the sample Microelements	B 249.677 (cps)	V 292.464 (cps)	As 193.696 (cps)	Pb 220.353 (cps)	Cd 228.802 (cps)

Amount (mg/10 g)	0,057	0,104	0,000	0,203	0
In the sample Microelements	Zn 206.200 (cps)	Cu 327.393 (cps)	Co 228.616 (cps)	Ni 231.604 (cps)	Ag 181.975 (cps)
Amount (mg/10 g)	0,122	0,070	0,005	0,055	0,000
In the sample Macroelements	P 213.617 (cps)	Si 251.611 (cps)	Fe 238.204 (cps)	Na 589.592 (cps)	Ca 317.933 (cps)
Amount (mg/10 g)	14,003	0,172	2,321	2,196	5,761
In the sample Macroelements	Al 396.153 (cps)	S 181.975 (cps)	Mg 285.213 (cps)	K 766.490 (cps)	
Amount (mg/10 g)	0,893	10,933	7,533	54,739	

From the obtained results, it can be concluded that the underground onion of Cyperus rotundus taken for the experiment contains more elements such as potassium, phosphorus, sulfur, magnesium among macroelements and microelements. Therefore, the underground bulb of Cyperus rotundus can be used to satisfy the body's need for potassium, phosphorus, sulfur, and magnesium.

References:

1.www.kitobam.uz
2. https://uz.wikipedia.org
3. Tursunov .T, Naumov.Y, “Paxtachilik texnologiyasi”. “O‘qituvchi” 1986
4. Muxammadjonov.M.V, Zokirov.A.Z, “Go‘za agrotexnikasi”. T. “Mexnat”, 1988