Helianthus Tuberosus L. (Jerusalem Artichoke) Separation of Extractive Substances of the Plant and Their Chemical Analysis.

Nuraliyev Shuxrat Baxtiyorovich

Assistant,
Namangan Institute of Engineering and Technological, Uzbekistan
E-mail: shnuraliyev3112@gmail.com
Tel: +998973805001

ABSTRACT

In this article, the useful properties of the Jerusalem artichoke plant to the human body are given information on the separation of ash, moisture and extractive substances contained in the plant and their chemical analysis.

Keywords: Helianthus tuberosus L, Jerusalem artichoke, tapinambur, root fruit, biologically active substance, extractive, inulin, pectin, polysaccharides, medicinal, chemical, ash, moisture

The analysis of biologically active substances contained in plants from chemical chemistry, the study of their structure and properties leads, on the one hand, to the development of chemistry and the emergence of new directions in it, and on the other hand, to the creation and introduction of modern effective medicinal substances into medical practice.

Currently, 1/3 of the medicinal substances used in medicine are created on the basis of plant substances. Medicinal preparations from plants have a number of advantages over synthetic substances. In later times, the demand for them is increasing. One such plant, this land is pear. Because this plant contains many biologically active substances.

To the Asteraceae family belonging perennial plant, is a species of sunflower native to central North America. On the underground stems, 20-70 pear-shaped, oblong and smooth or wrinkled shoots of the surface are formed. Height 1.2-2.5, sometimes up to 4 m. Growth period 120-200 days, the root is also used for food. Contains 2.3% protein, 0.2% oil, 17.9% non-nitrogenous matter, 16-18% inulin, 1.3% ash and other substances.

a) **b)**

***Helianthus tuberosus* L., Jerusalem artichoke**

a) Top of the Earth. b) Appearance of tubers.

Jerusalem artichoke homeland was considered North America, and before the conquest of North America by Europeans, tapinambur tubers were consumed by Brazilian Indians as food (the name of the plant also comes from the name of this Indian tribe- "tupinamba").

Useful properties of Jerusalem artichoke. The Jerusalem artichoke contains inulin and pectin substances from polysaccharides, ensuring the excretion of many toxic substances from the body.

Pectin and inulin further activate the functioning of the gastrointestinal tract and stimulate the activity of bile excretion.

The consumption of Jerusalem artichoke makes the body more stable to various infections and viruses, as well as substances that poison the digestive organs. Its beneficial substances never allow the entry into the body of various bacteria and parasit es such as lyamblia, opistorchis. It is distinguished by the features of the appearance of normal microflora in the intestines. Therefore, it is very useful for people with dysbacteriosis.

Jerusalem artichoke are useful for the mucous membrane, stimulating their blood supply. It is useful in the treatment of diseases such as stomach ulcers, duodenum, colitis, gastritis, enteritis, pancreatitis, burns, diarrhea and constipation.

It can be used to treat diabetes, pancreatitis, intestinal inflammation and hypertension. At the same time, nitrates that have entered the body have the property of dissolving toxins, stones, and salts. Jerusalem artichoke normalizes the work of the gastrointestinal tract, urinary tract, upper respiratory tract.

Based on this, the goal was to chemically analyze the composition of the Jerusalem artichoke plant.

To achieve this goal, substances were separated from the upper and root parts of the Jerusalem artichoke plant, and the substances obtained were chemically analyzed.

Results obtained . Shown in Table 1.1

The composition of the earth pear plant content of ash, moisture and extractives.

Table 1.1.

Plant body Name	**Humidity %**	**Ash %**	**Extractive substances**		
			Methyl alcohol **96%**	Methyl alcohol **40%**	water
Green mass	71,9 %	2,4%	27,5%	20,1%	22,6%
Root fruit	78,6 %	1,9 %	21,6 %	18,2 %	19,1 %

From the results obtained (Table 1.1) it turned out that the formation of a red-colored solution under the influence of concentrated hydrochloric acid and zinc powder using alcohol extracts testified to the presence of flavonoids.

For greater clarity, the yellow color characteristic of flavonoids when heated by adding a solution of ammonia to extractive substances. Lead (II)-a clear yellow precipitate characteristic of flavones under the action of acetate, and when dripped from a 5% solution of aluminum chloride, the color of the solution changed to yellow, which is characteristic of most flavonoids. When exposed to a 5% solution of Iron(III)-chloride in alcohol, a green color characteristic of flavonoids was formed.

The coloring of the liquid in blue when a saturated solution of potassium Hexacyanoferrate (III) and 1.0% solution of iron (III) chloride is added to the solution to determine the content of vitamins in an alcohol solution means that the extractives contain ascorbic acid.

It also became known that when poured from a solution of 0.01% methylene blue and 10% sodium bicarbonate, the liquid lost color when heated, the extract contained gamma-lactone 2,3-dehydro-L-gulonic acid, that is, vitamin C.

It is worth noting that within the ash elements contained in the plant there are more Ca, Mg, Fe. At the same time,it was found that the green mass contains up to 5-6% Ca and 3-3.5% magnesium.

The extractive substances of the green and tubers of the plant were determined by the qualitative reaction of the presence of citric acid from organic acids in the composition. To do this, a gas outlet pipe was installed in two test tubes and test tubes were heated, dripping 10 drops of sulfuric acid into them. Two test tubes were taken in Aloxi and dripped into one from a solution of barium hydroxide, dripped into the second test tube from a solution of two drops of iodine in potassium iodide, and 10% sodium hydroxide solution was added to remove the color. With the onset of gas discharge from the first test tube when heated, when a solution of barium hydroxide is lowered into the tube, the color of the solution disappears. Then, the gas outlet tube was lowered into the second test tube. In the second test tube, a pale yellow precipitate with a characteristic odor was formed. When the second test tube was heated and the same experiment was carried out, the same situation as above was manifested. So it turns out that there is really citric acid.

Citric acid (2-hydroxy — 1,2,3-propantricarbonic acid) when heated in the presence of sulfuric acid, the process of decarboxylation goes away, which eventually turns into acetone.

The presence of pectin in the composition of extractive substances from polysaccharide substances was also checked on the basis of qualitative reactions. To do this, the following method was used:

Monitoring the formation of floccules under the influence of alkaline earth metals.

In order to determine the mavjdiness of pectin substances in the composition of extractive substances obtained in an aqueous medium, when calcium hydroxide was added to it, a small amount of sediment was slowly formed. But when barium hydroxide was added, quickly and relatively more sediment was formed. Flocules are not formed under the action of sodium, potassium and ammonium hydroxides. From this it turned out that the extract contains a soluble substance pectin.

Conclusion: In conclusion, it can be said that now polysaccharides isolated from the root of the Jerusalem artichoke plant have many beneficial properties for the human body and can be used in the treatment of patients suffering from diabetes and stomach diseases.

Used literature.

1. Кочнев Н.К. М.В. Топинамбур - биоэнергетическая культура XXI века/ Н.К. Кочнев, М.В. Каменечева. - М.: Типография «Арес», 2002. - 76 с.
2. Зеленков В.Н., Шелпакова И.Р., Заксас Н.П. Минеральный ихимический состав различных частей культуры топинамбура. Сборник научных трудов. — Инновационные технологии и продукты. Выпуск 3. Новосибирск, НТФ. 144—АРИС, 1999, - 62с.
3. Дехконов Р.С., Нуралиев Ш.Б. Ернок пектинининг суюлтирилган эритмасини гидродинамик хоссаларини ўрганиш. //Физиология ва валеология асослари фанларининг долзарб муаммолари. Республика Онлайн илмий конференция материаллари. Наманган. НамДУ. 2020 й. 102-104 бетлар.
4. Dehqonov R.S., Mamatqulova S.A., Nuraliyev SH.B. Yernok o'simligidan polisaxarid-pektin moddasini ajratib olish va uning ayrim xossalarini tahlil qilish. //Физиология ва валеология асослари фанларининг долзарб муаммолари. Республика Онлайн илмий конференция материаллари. Наманган. НамДУ. 2020 й. 104-107 бетлар.
5. Дехконов Р.С., Тошматов Й.Р., Нуралиев Ш.Б. Озиқ-овқат саноатида қўлланиладиган полисахаридларнинг сертификатлашга оид муаммолар. // Товарлар кимёси ва халқ табобати муаммолари ва истиқболлари. VII-Халқаро илмий-амалий конференция материаллари. АндДУ. 18-19 сентябр. 2020 й. 345-348 бетлар.
6. Dehqonov R.S., Abdullayev SH.V., Nuraliyev SH.B. Asteracea oilasiga mansub (yer nok) tuganagini kimyoviy tahlil qilish. // Qurolli kuchlar, fan, ta'limda innovatsion ishlanmalar. NamDU va O'ZR Qurolli kuchlari akademiyasi bilan hamkorlikda ilmiy maqolalar to'plami. 2020 y. 15-17 bet.
7. Dehqonov R.S., Abdullayev SH.V., Nuraliyev SH.B. Asteraceae oilasiga mansub (yernok) tuganagining kimyoviy tahlil qilish. / "Табиий фанлар ва экологияга оид айрим муаммолар" XV-илмий мақолалар тўплами. Наманаган. 2020 й. 174-176 бетлар.
8. MI Soliev, O Abdilalimov, SB Nuraliev. Reactions of Thymol, Menthol, and Hydroxymethyl-Chamazulene in a Superbase Medium. Spanish Journal of Innovation and Integrity 5, 625-628.
9. http://sjii.indexedresearch.org/index.php/sjii/article/view/201
10. 9. N Shuxrat. Helianthus tuberosus l.(yer nok) o'simligining ekstraktiv moddalarini ajratib va ularning kimyoviy tahlil qilish. Yosh Tadqiqotchi Jurnali 1 (5), 531-535. http://2ndsun.uz/index.php/yt/article/view/456