



**DETERMINATION OF WATER-SOLUBLE VITAMINS
IN GREEN PEAS**

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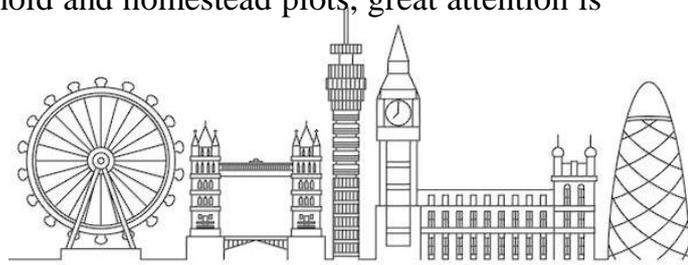
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ANNOTATION: *In this article, information about the green pea (Gorok) plant, its chemical composition, medical importance, and the amount of water-soluble vitamins in the green pea seed were determined by high-performance liquid chromatography, and its physicochemical properties and spectral characteristics is talked about.*

Key words: *Green peas (Gorok), Potassium, phosphorus, iron, vitamins A, B₁, B₂, Starch*

INTRODUCTION.

Today, it is difficult to imagine the table of our people without vegetables and dairy products. For this reason, great attention is being paid to the cultivation of vegetables and fruit products in the republic in the following years. As a result, the population's interest in vegetable crops and their cultivation is increasing. This, in turn, is an important source of filling our markets with a variety of vegetable products, as well as improving the material well-being, lifestyle and healthy diet of families, ensuring that their free time is occupied with useful work. It is known that it depends on the agriculture of each country and the level of food supply. Due to the planned expansion of the area of vegetable crops in our country, more and more vegetable products are grown. Today, at a time when the shortage of food products in the markets of some countries is threatening, our President Sh. The instructions of M. Mirziyoev and the government of the republic on the further development of the industry make the issue of increasing and exporting vegetable-polished products the main task. Decision PQ-3978 of the President of the Republic of Uzbekistan "On additional measures to increase the efficiency of the export of fruit and vegetable products to foreign markets" published on October 17, 2018 and the Cabinet of Ministers of the Republic of Uzbekistan in the republic Decision No. 935 dated November 20, 2018, "On additional measures to increase the volume of fruit and vegetable processing in 2019-2020" is also dedicated to this area. It says, among other things: "On the basis of efficient use of household and homestead plots, great attention is





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being paid to the issues of increasing the production of fruit, grapes, vegetables, sugar, and leguminous products and increasing the volume of exports. At the same time, the analysis of the commissioning of new facilities for the processing (drying) of fruit and vegetable products grown in households and farm plots shows the need to further develop activities in this direction and implement new projects in some districts of the republic. is doing.

THEORETICAL PART

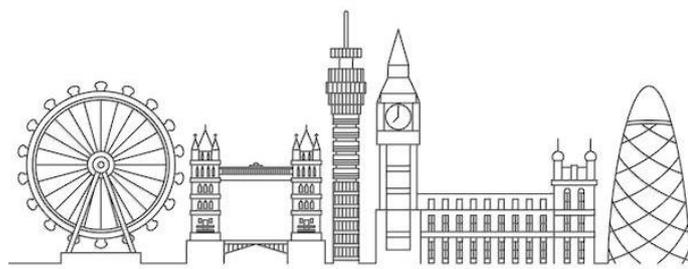
Green pea (Gorok) is a self-pollinating plant, it is an annual leguminous grain crop belonging to the legume family. It has more than 30 species, which are found mainly in Eurasia, North and East Africa. Peas are planted on porous, sandy, slightly saline soils. At present, there is a variety of green peas (gorok) grown in Uzbekistan. In Uzbekistan, mainly Zimistany, Lazzat, Uzbekistan-32, Yulduz varieties of peas are grown. Cultivation is done 1-2 times between rows on irrigated lands. Peas are watered less. Watering in moderation during the flowering period gives good results. When it is fully ripe, the leaves fall off, the pods are almost unripe, and the harvest is harvested in grain harvesters. It is also harvested by hand with the stem and brought to field conditions or to special areas and threshed. Today, green peas (gorokh) are grown in Azerbaijan, Armenia, Afghanistan, Bangladesh, Great Britain, Germany, Georgia, Iraq, Iran, Italy, Kazakhstan, Korea, Kyrgyzstan, Latvia, Holland, Pakistan. , being exported to countries such as Russia, Serbia, Tajikistan, Turkmenistan, Turkey and Ukraine. Green pea seeds and ready-made fruit and crushed appearance of the fruit. [1-4] (Figure 1)



Figure 1. Green pea seeds and ready-made fruit and crushed appearance of the fruit.

Canned green peas are served in salads at least once a year (New Year's). It's delicious and nutritious, and it's good for your health. Even so, the amount of vitamins in it is higher than that of many vegetables. It is very rich in potassium, phosphorus, iron, vitamins A, V1 and V2. It is not suitable to eat more than 3-4 days a week, the daily norm is 150 grams. Green peas contain starch and dietary fiber, which help in relieving gastrointestinal problems. The fiber contained in chickpeas regulates cholesterol levels in the body and helps to get rid of slag and toxins. That is why skin, hair and nail problems are often unknown to those who regularly consume this product.

Green peas, known for their antibacterial properties and native to the islands of northern Maluku, have been the subject of scientific research. [4-6]



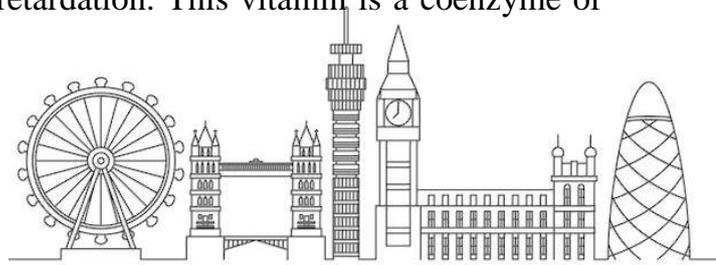
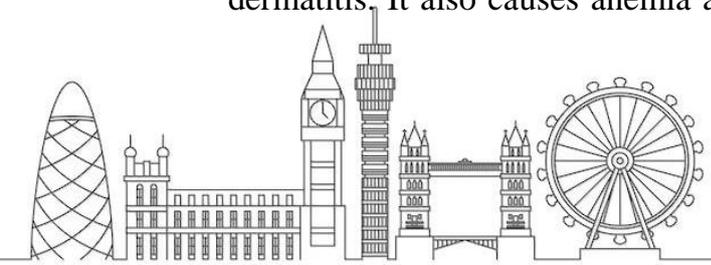


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Vegetables are one of the main types of food due to their deliciousness, nutritional value and medicinal properties. The nutritional value of vegetables is determined by the amount of carbohydrates, proteins, fats and other substances in them. The biochemical composition of vegetables consists mainly of water (60-90%), and dry matter is cucumber, tomato -4-7 %, root vegetables - 11-17%, green peas – 24 %, garlic - 35%. ladi (Table 1). Therefore, the nutritional value of vegetables is not high. One kg of most consumed vegetables has 150-400 kcal or 600-1700 kj. Vegetables as food cannot meet the body's energy needs. But they serve as a source of biologically active substances, vitamins, enzymes, proteins, oils, carbohydrates, mineral salts, etc. necessary for the human body. Vitamins play a big role in people's life activities and healthy eating. [7-8]

Vitamins were first discovered in 1880 by N.I. Lunin. He came to the conclusion that in addition to proteins, carbohydrates, fats and mineral substances that provide normal life, there are also organic substances necessary for life. Vitamins are called substances necessary for life (vita means life, vitamin means life amines). Vitamins are small molecular organic compounds that are extremely important in the life and activity, growth and reproduction of organisms. Vitamins have the following properties: - they are not synthesized in the human body; - does not participate in the formation of structures; - when they are not enough in the body, the metabolism is disturbed and causes specific diseases; - vitamins consumed with food affect biochemical processes in the body as coenzymes. A change in the amount of vitamins in the body leads to the following conditions: 1. Avitaminosis - diseases caused by the lack of some vitamin in the body. 2. Hypovitaminosis - diseases caused by vitamin deficiency. 3. Hypervitaminosis - diseases caused by an excess of vitamins.

Sofar, more than thirty vitamins have been identified, and they are divided into three groups: water-soluble, fat-soluble vitamins, and vitamin-like substances. Water-soluble vitamins include: Vitamin B1, Vitamin B2, Vitamin B6, Vitamin B12, Vitamin PP, Biotin, Vitamin N, Vitamin C, Vitamin P. Fat-soluble vitamins include: vitamin A, vitamin D, vitamin E, vitamin K. Water-soluble vitamins: Vitamin B1 - thiamine, is the first vitamin to be isolated in pure form. Lack of vitamin B1 - avitaminosis occurs in beriberi or polyneuritis. Vitamin B1 causes a violation of carbohydrate metabolism. Vitamin B1 is a coenzyme of pyruvate decarboxylase. This vitamin is found in large quantities in eggs, meat, and peas. The daily requirement of the body is 1-3 mg. Vitamin B2 is called riboflavin and it has a yellow color. Deficiency of this vitamin leads to avitaminosis, colds of the mucous membrane of the oral cavity, impaired vision, and anemia. Riboflavin is a coenzyme of flavin enzymes. A person receives 65-70% of this vitamin through dairy, meat and bread products, 30-35% through vegetables and fruit products. Daily requirement - 2 mg. Vitamin B6 (pyridoxine). A lack of vitamin B6 causes a disturbance in the metabolism of amino acids and leads to a skin disease called dermatitis. It also causes anemia and growth retardation. This vitamin is a coenzyme of





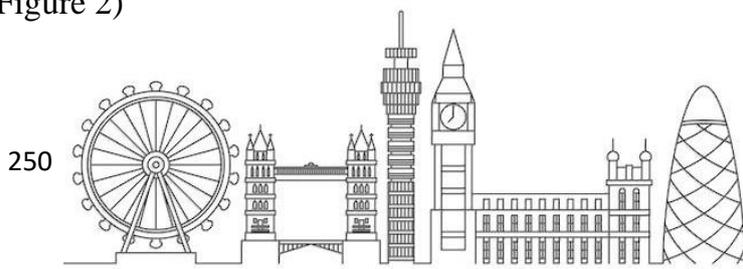
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enzymes that catalyze the reamination reaction of amino acids. Vitamin compounds: pyridoxine, pyridoxal and pyridoxamine. Vitamin B6 is mainly found in meat, fish, and grain products. In older people, it is vitamin requirement 2 mg. is Vitamin PP (nicotinic acid). Nicotinic acid is important in metabolic processes in living organisms. It is a coenzyme of dehydrogenase enzymes that catalyze oxidation-reduction reactions by becoming part of NAD and NADF. It is a derivative of pyridine: nicotinic acid and nicotinamide. Vitamin PP deficiency causes pellagra disease. The nervous system and digestive system are disturbed. Vitamin PP is found in cereals and vegetables. The daily requirement for an adult is 7 mg. Vitamin C (Ascorbic acid). Humans, monkeys and guinea pigs do not synthesize ascorbic acid, so they consume vitamin C with ready-made food. If there is a lack of products rich in vitamin C in the food, people and some animals develop ringworm. Milks cause bleeding and blood accumulation under the skin. If vitamin C is not taken into the body, it leads to death. Vitamin C increases the body's antioxidant capacity. Ascorbic acid serves as an intermediate that transfers hydrogen in oxidation-reduction reactions in living organisms. Vitamin C is abundant in plums, oranges, lemons, dill and other plants. The daily requirement of an adult is 0.2-1 g. is [5-12]

DISCUSSION OF RESULTS

Water-soluble vitamins in green pea seeds were determined using the high-performance liquid chromatography (HPLC) method. 5-10 g of green peas are taken out on an analytical scale and placed in a 300 ml flat flask. 50 ml of 40% ethanol solution is added to it. The mixture was heated under vigorous stirring for 1 h, equipped with a magnetic stirrer, reflux condenser, and then stirred at room temperature for 2 h. The mixture is cooled and filtered. The remainder was re-extracted 2 times with 25 ml of 40 percent ethanol. The filtrates were combined and filled to the mark with 40% ethanol (5-10%) in a 100 ml volumetric flask. The resulting solution is spun in a centrifuge at a speed of 7000 rpm for 10 minutes. The resulting solution was taken from the upper part for analysis. Working solutions of water-soluble vitamins with a concentration of 1 mg/ml were prepared. For this purpose, 50.0 mg of each vitamin standard is taken on an analytical balance and dissolved in 40% ethanol in a 50 ml volumetric flask and filled to the mark.

Acetate buffer system and acetonitrile were used as an eluent for the determination of water-soluble vitamins contained in green pea seeds by YSSX. Chromatographic conditions:-Chromatograph Agilent-1200 (equipped with an autodoser);-Column Exlipse XDB C 18 (obraschenno-faznyy), 5 μ m, 4.6 x150mm; -Diode matrix detector (DAD), 250 nm identified; -Flow rate 1ml/min; - Eluent acetate buffer: acetonitrile: 0-5 min 96:4, 6-8 min 90:10, 9-15 min 80:20, 15-17 min 96:4, thermostat temperature 25 0C, -5 μ l injected amount. First, a working standard solution was prepared in the chromatograph, then a solution prepared from green pea seeds was introduced, and the amount of vitamins was determined by comparison. (Figure 2)





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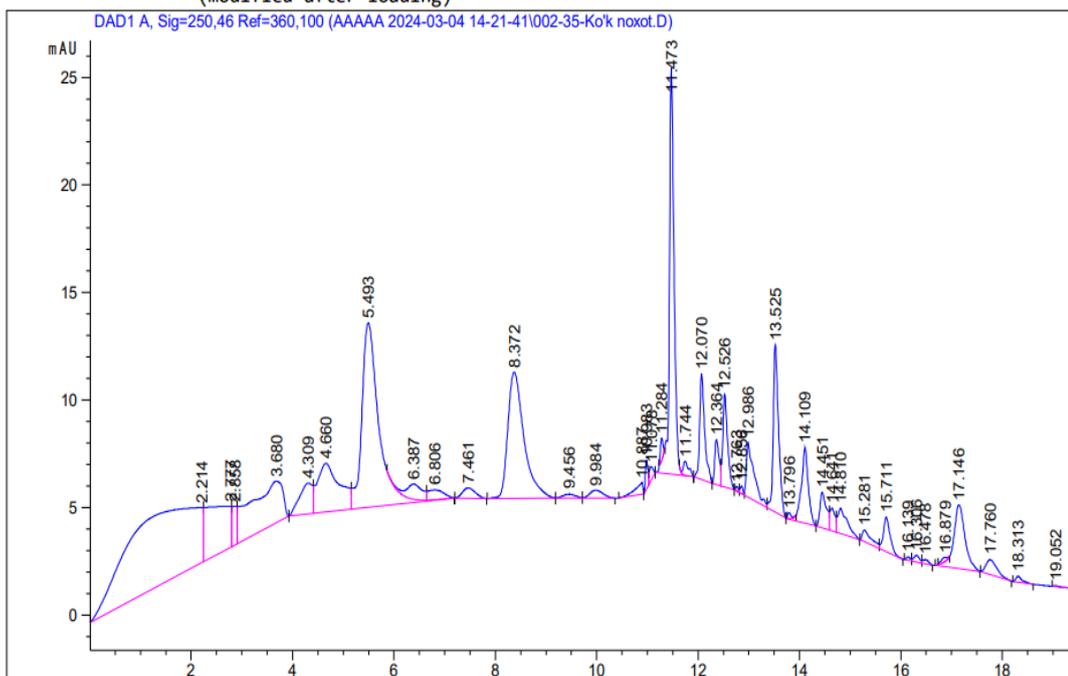


Figure 2. Green Pea Seed Solution Chromatography for Determination of Green Pea Seed Vitamins

It can be seen from the chromatography that B1=1.38752 mg., B2=2.48795 mg., B6=4.82712 mg., B9= 4.28744 mg., (PP) B3= 0 in green pea seeds. ,28776 mg. Vitamin C was found to be in the amount of 2.28798 mg.

CONCLUSION:

When the amount of water-soluble vitamins in green pea seeds was studied using the high-performance liquid chromatography (HPLC) method, in green pea seeds B1=1.38752 mg., B2=2, 48795 mg., B6=4.82712 mg., B9= 4.28744 mg., (PP) B3= 0.28776 mg. Vitamin C was found to be in the amount of 2.28798 mg.

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