

Biological description of pea (*Cicer arietinum*) plant

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ANNOTATION: There are several types of leguminous plants on earth, of which the types, biological characteristics and mineral composition of the pea plant are listed. At the same time, we see the effect of the pea plant on human health in medicine.

Key words: lentil plant, leaves, flowers, mineral content, health benefits

Peas – *Cicer arietinum* is an annual cultivated plant species. The root is an arrowroot, the stem is herbaceous, grows upright, rough, ribbed, hairy, 20-70 cm tall. The leaf is complex, flat. Flowers are bisexual, butterfly-shaped, small in size. The color of the flowers is white, yellow, yellow-green, pale pink or blue. The fruit is a pod, the pod contains 1-2, sometimes up to 4 grains. The weight of 1000 seeds is 220-300 g, sometimes up to 600 g. The color of the grain is light-yellow, orange-yellow. The seeds are curly-coarse, 0.5-1.5 cm in diameter. Self-pollinating. The vegetation period of early varieties is 90-110 days, late varieties are 150-220 days. It also has names such as *C. album*, *C. arietinum*, *C. edessanum*, *C. grossum*, *C. nigrum*, *C. physodes*, *C. rotundum*, *C. sativum*, *C. sintenisii*, *Ononis crotalarioides*.

Like other types of plants and forage crops, pea grains also have different chemical composition depending on their variety, growing region and bioecological characteristics. A 100 g serving of pea grains contains ~10 g of water, ~47 g of carbohydrates, ~7 g of fat, ~22 g of protein, ~11 g of dietary fiber, and up to 3 g of residual ash (minerals). Nutritional energy value is 337 kcal per 100 g of product.

The chemical composition of peas contains a large amount of vitamins of group B, ω -3 and ω -6 acids, iron, and folic acid. Nutritionists recommend peas as a general energy booster for the body, for heart disease, and for strengthening the immune system. Due to the presence of proteins, fiber, starch and many other biologically active compounds, it is desirable to include peas in the human diet.

Pea grain proteins are present in amounts from 18% to 29% and are highly absorbed by the body. Their assimilation rate is about 89%. Most of the pea proteins consist of globulins and albumins. Lipids are present in the amount of 4.5-6.6%, of which 10.8% are palmitic, 33.5% oleic, 49.7% linoleic and 2.4% linolenic fatty acids. Pea grains also contain tocopherols (230 mg per 100 g of oil) and carotenoids (46.3 mg per 100 g of crushed grain). However, there are also compounds that reduce the caloric and nutritional value of chickpeas, such as trypsin inhibitors, hemagglutinins, enhancers, phytic acid, and saponins.

Introduction. Due to the richness and nutritional value of the grains of the pea plant, they are rich in macro- and micro-elements and organic content. Despite the deep study of their composition, changes in soil and atmospheric ecological conditions lead to a violation of the balance between the biochemical composition. Researching such changes is directly related to protecting the health of consumers. The content of microelements is compared with their average content in the lithosphere and soil, assessed from the point of view of their accumulation and dispersion. [1. p. 45]

The products obtained from leguminous plants are directly related to their chemical composition. The chemical composition depends on their species, cultivated soil and climatic conditions. For this reason, studying the chemical composition of grains and stems of leguminous plants grown under different conditions is one of the urgent tasks. [2. p. 185]

Initial data and research methods.. The amount of elements in the pea grains (fruits) grown in Fergana region was studied. For this, samples were taken from them in the prescribed manner and instrumental neutron activation analysis of the samples was performed.

The nuclear reactor of the Academy of Sciences of the Republic of Uzbekistan Institute of Nuclear Physics was used as a source of neutrons. The neutron flux in the irradiation channels was $5 \cdot 10^{13}$ neutrons/cm² *sec.

A 1.8 KeV resolution and high-purity germanium detector along the Co-60 ha mm line and a gamma spectrometer with computer software were used to record the induced activity. Data were processed using GENIE-2000 software. The detection error did not exceed 15%. The accuracy of elemental quantification was verified by checking the certified values of MAGATE Algae IAEA 0393 and Licken IAEA 336 standards as well as NIST standard material 1572 –CITRUS LEAVES.

For analysis, samples of 100 g of pea grains were taken and dried to a constant mass at a temperature of 50-600C. The samples were kneaded in a porcelain mortar until they reached a homogeneous mass. Then they were taken in two different ways. 1) 40-50 mg for short-lived radionuclide analysis and 2) 90 mg for long-lived radionuclide. Each of them was packed in plastic bags and each sample was subjected to neutron activation analysis.

The studied pea plant has the highest amount of potassium and the lowest amount of gold (0.0029). Of the macroelements, potassium 11900, calcium 870, sodium 56, barium was 52.1 mkg/g.

Amounts of elements classified as toxic and controlled by certification agencies: As (0.8 mkg/g), Co(0.18) mkg/g, Zn(35 mkg/g), Ni(1.8 mkg/g), Hg(0.046 mkg/g) corresponds to the established normative indicators.[3. p.95]

The amount of elements in the grains of the pea plant decreases in the following series.

K>Ca>Na>Fe>Ba>Zn>Mn>Sr>Mo>Ce>Sm>Br>Rb>La>Ni>W>As>Se>Nd>Cr>Tb>Yb>Co>Ag=Th=U>Eu>Hg>Ta>Lu=Ce>Sb>Au>Sc>Hf

No information about radionuclides in leguminous plants has been reported in the studies carried out to date. The detection of radioactive elements such as uranium in the studied samples confirms that research in this field has not been completed.

Conclusions. Analyzing the amount of macro- and micro-elements in the grains of the pea plant allows to analyze the biological complexes formed by these elements with organic content. The composition of chemical elements in pea plants depends on the soil and climatic conditions in which they are grown. Therefore, the analysis of the chemical composition of leguminous plants grown in different places with the biological properties and geochemical composition of the soil gives reasonable results.

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