



**STRUCTURE AND CHEMICAL COMPOSITION OF POACEAE
FAMILY REPRESENTATIVES**

Maftuna Abdimo`Minova Alisher Qizi

Student of Termez State University

Mail: abdumuminovam@mail.ru

Annotation

The article provides general information about the structure and chemical composition, morphological properties of the grain of some plants belonging to the family of wheat, the specific features of cereals (leaf structure, root system, flower, spike structure, stem) and chemical composition.

Keywords: Enzyme, protein, flower, poaceae, root, soil, moisture, temperature, light, triticum, endosperm, starch, aleyron layer

Introduction

Wheat is the most important food crop. It is the world's largest producer of grain, including in the CIS.

The main properties of wheat are the structure and chemical composition of the grain, as well as the structure and composition of its constituent tissues. The grain of wheat consists of a husk, an aleurone layer, an unsystemic endosperm, and an aphid.

On the outside, the wheat grain is covered with fruit and seed husks. The husk consists of several layers of cells, which make up 4-6% of the total grain mass of wheat. [1]

Underneath the fruit is a seed coat. It is thin and brittle, making up 2-2.5% of the grain mass. Fruit and seed shells contain small amounts of protein, sugars and fats, most of which are minerals and substances that are poorly digested by the human body, such as cellulose and hemicellulose. In addition, the shells of fruits and seeds darken the color of the flour, which reduces its quality. Therefore, the fruit and seed layers are separated during the flour production process.

The aleurone layer is the outer layer of the endosperm, made up of a series of thick-walled cells. The aleyron layer is composed of proteins, fats, sugars, cellulose and minerals. The aleyron layer makes up 4 to 9% of the grain mass. [1]



The inside of the wheat grain is completely occupied by the endosperm. The endosperm is made up of large cells filled with starch and protein particles. The color of the endosperm is white or slightly yellow. The endosperm can be transparent, opaque or partially transparent.

The chemical composition of the endosperm differs from the composition of all other parts of the grain. It contains 78-82% starch, around 2% sugar, 13-15% protein, 0.3-0.5% minerals, 0.5-0.8% fat, 0.1-0.15% cellulose. consists of. [2]

Endosperm makes up 80-84% of the mass of wheat grains. This allows you to get a large amount of wheat flour for processing. The protein, carbohydrate and enzyme properties of wheat are also important. Wheat contains proteins called gliadin and glutenin. These proteins drown in water, absorb more water than their own mass, and form a bound elastic mass called gluten. The elastic properties of gluten allow to make high-quality bread and high-quality pasta and similar products from wheat flour.

The spike on the sharp side of the grain is covered on the outside with a layer of fruit or seeds. The mass of the stalk is 2-3% of the mass of the grain. Murtak contains: 33-39% protein, 25% sugars, 12-15% fats, 2.2-2.6% cellulose and minerals. Murtak is rich in vitamins. [2]

In total, the amount of water in the grain is about 14%, protein - 11.6-12.5%, carbohydrates - 67.5-68.7%, including starch - 53.7-54.9%, cellulose - 2.3-3.4%, fats 1.6-1.9%, minerals - 1.7-1.8%.

Wheat is divided into hard and soft types. Soft wheat accounts for 90% of the wheat grown and harvested in the CIS.

Soft wheat is called triticum aestivum in Latin. The consistency of the grain varies: partially transparent, completely transparent and opaque. This grain is used in bakery and in the manufacture of flour confectionery. In addition, soft wheat is also used in the production of pasta due to the shortage of special pasta flour made from durum wheat.

Varieties of soft wheat have different transparency and baking properties. According to these characteristics, wheat grains are divided into strong, medium strong and weak varieties. The transparency of strong wheat varieties is usually higher than 60%, and the content of wet gluten is not less than 28%. In weak varieties, the protein content is 9-12%, and the amount of hand gluten is not more than 20%. Their transparency can be up to 40%. [9]



The gluten of weak wheat varieties is inelastic and overly stretchy. Strong varieties of wheat are used to improve weak varieties in flour milling. Medium-strong wheat varieties (transparency 40-60%) are suitable for grinding baking flour without the addition of additives due to their technological properties.

Durum wheat (*Triticum durum*) is a valuable raw material for the production of pasta. It contains a lot of protein, and therefore a lot of gluten, and the consistency of the grain is mostly transparent. In addition, hard wheat grains contain carotenoid pigments that are not found in soft wheat. This property of durum wheat provides the amber-yellow color typical of high-quality pasta. [4]

Durum wheat is very demanding to climate and weather conditions and does not always produce high yields. As a result, durum wheat is rarely grown in most countries.

In recent years, measures have been taken to increase the production of durum wheat in the country.

Rye is the second most important cereal crop after wheat. Rye grain differs from wheat in appearance. In rye, the aleurone layer and the stalk are longer than the wheat grain, and the endosperm is smaller. However, rye also differs in chemical composition. It contains less protein and starch than wheat, and more sugar and glue. The main difference is not in the amount of protein, but in its physicochemical properties. Rye grain proteins have unlimited swelling and easy digestion.

The most important difference of rye proteins is that they do not form gluten that can be washed under normal conditions. The starch content of rye grain is less than that of wheat grain and is 56-64% relative to dry matter. Rye starch is characterized by a low degree of pasteurization (54-60 C) compared to wheat grain starch. Rye paste is characterized by high viscosity and slow wear. That's why rye bread slowly wears out.

A distinctive feature of rye grain is the high content of water-soluble substances in 12-17% of the total grain content (in wheat they are 5-7%).

The husk layer of rye (along with the aleurone layer) is radically different from wheat grain. They are low in minerals, insoluble carbohydrates (including cellulose), high in sugars, pectin and other soluble substances. The peculiarities of the composition and structure of the rye husk are clearly seen in the properties of rye flour and rye flour and bread made from them.



Oatmeal is a grainy, white or yellow, ovoid grain that looks like an oval or a stalk. The flower layer is thick and rough, and consists mainly of cellulose, pentosans, and minerals. They make up an average of 28% of the grain mass.

The chemical composition of oatmeal consists of 14% water, 10.1% protein, 57.8% carbohydrates, including 36.1% starch, 4.7% fat, 10.7% fiber, 3.2% minerals. .

Oats are fast-cooking and are valued as a raw material for the production of cereals for certain dietary and baby foods. Oatmeal is used to make oatmeal cookies. Most of the oats are used as livestock feed.

Barley is a coarse, light yellow or greenish-yellow, ovoid oblong grain. The flower layer is thick and rough, making up 9-14% of the grain mass.

The chemical composition of barley grain is mainly: 14% water, 11.5% protein, 65.8% carbohydrates, including 50.1% starch, 2.0% fats, 4.3% cellulose, 2.4% minerals. formed.

Barley is used for various purposes - in the production of cereals, beer, malt, and as fodder. Barley is an important raw material in brewing.

Maize is one of the world's leading crops, along with wheat and rice. When grown under favorable conditions, it is a very productive plant and can produce up to 50 s of grain per hectare, or 300-600 quintals of green mass.

The corn husk consists of a porous stick and 400-600 grains attached to it. In mature soybeans, 22-25% of the mass of soybeans falls on the porous rod, and 75-78% on the grain husk.

The average chemical composition of corn grain is as follows: 14% water, 9.3-11.9% protein, 63.6-69.4% carbohydrates, including 54.3-59.8% starch, It consists of 4.0-5.9% fats, 2.0-2.7% cellulose, 1.1-1.6% minerals.

About 25% of the world's corn is used in direct feeding. The remaining grain is used as raw material for various branches of the processing industry or for animal feed in agriculture. Corn is used in the starch-molasses industry as a raw material in the production of natural and modified starch, molasses, glucose and others. Corn is of great importance as a fodder crop, as corn is grown not for grain but for green mass used in its natural or silage form.

Millet, rice, and buckwheat are used to make almost all cereals, so they are commonly referred to as cereals.

It is an important drought tolerant plant. The porridge from tariq is called sok. Tariq is also used in the preparation of malt, which is used in the production of alcohol.



The millet grain is small, ovoid, sometimes almost round in shape, 2 mm in diameter. The millet grain is smooth on the outside, but very hard, surrounded by a flower shell that makes up 16% of the grain mass. The core of the millet is white to light yellow, transparent or opaque.

The chemical composition of millet grain is 14% water, 11.2% protein, 60.7% carbohydrates, including 50.4% starch, 3.8% fat, 7.9% cellulose, 2.9% minerals. Grechixa - belongs to the family of buckwheat. Buckwheat is grown for grain and as a honey extractor. The fruits of buckwheat consist of triangular nuts of different colors. The fruit, which is separated from the peel, is called the kernel and is used as a cereal. Buckwheat groats have a high taste, high content of cellulose and minerals, buckwheat protein is valuable in terms of amino acid content, which allows it to be used in the diet.

The average chemical composition of buckwheat grain is 14% water, 11.6% protein, 59.5% carbohydrates, including 54.9% starch, 2.3% fat, 10.8% cellulose, 1.8% mineral substances.

Rice is one of the main and ancient cereals. Rice is the second largest crop in the world after wheat. Rice is mainly used in the preparation of cereals (rice), in the production of flour and starch used for special purposes.

Rice porridge has high taste and is easy to digest. This makes it an integral part of the diet and children's diet.

The rice grain is veiled and covered on the outside with a rough flower shell that makes up 20% of the grain mass. The shells come in a variety of colors - white-yellow, dark brown, red.

The average chemical composition of rice grain: 14% water, 7.3% protein, 63.1% carbohydrates, including 55.2% starch, 2.0% fat, 9.0% cellulose, It contains 4.6% of minerals.

Conclusion

Thus, the grain of the wheat family contains starch, protein, minerals and vitamins. Wheat is rich in minerals and vitamins, especially whole grains and fortified products, and has a high nutritional value. The chemical composition of wheat grains is very variable. Its protein, gluten, minerals, vitamins, pigments and enzymes have been studied to vary depending on climate, soil and fertilizers, applied agricultural techniques and varieties.



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