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CHEMICAL COMPOSITION OF REPRESENTATIVES OF THE HORDEUM L. FAMILY, APPLICATION AND ECONOMIC IMPORTANCE IN FOLK MEDICINE

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Abstract

It is known that synthetic drugs do not always give the expected result. Along with the therapeutic effect, they also have side effects that make it difficult for other systems of the body to work smoothly. Medicinal plant-based drugs have almost no side effects compared to synthetic drugs. Due to the fact that various biologically active substances present in the composition increase their interaction, it has a complex effect in the treatment of various diseases.

Keywords

Hordeum L., common barley, phenolic compounds, folk medicine, carbohydrates.

Introduction

Medicinal products obtained from plants regulate appetite, improve quantitative indicators of vitamins, trace elements, mineral salts, membrane permeability, secretion and absorption processes. Phytotherapeutic drugs help restore normal intestinal microflora and treat dysbacteriosis. They have a positive effect on the patient's nervous and endocrine systems, improve the mucous membrane of the gastrointestinal tract, which leads to the physiological correction of digestive processes. Conduct research on the development of new highly effective and harmless drugs based on local plant raw materials and their introduction into medical practice.

Materials and Methods

Collecting scientific literature and Internet data and developing statistical indicators based on them.

Results

Common barley is one of the oldest cultivated plants. The genus Barley includes about 40 species. Barley species are fodder plants and are distributed in all parts of the globe except the Arctic. Barley is widely cultivated in Western Europe, Southwest Asia, India, China, Japan, North and South America. Varieties of barley (spring, winter, two-row, multi-row) differ from each other in many ways.

The chemical composition of barley grain depends on the variety, agrotechnical and meteorological conditions during cultivation, as well as agrotechnology, for example, the order and amount of fertilizer application [1].

Therefore, depending on the cultivation in different agrotechnics, climate, soil and technical conditions, grains of the same variety can differ in terms of mineral and organic compounds [2].

85% of the mass of ordinary barley grain consists of organic substances, and only 2-4% is inorganic compounds. An important component of grain is water. Barley moisture can be from 8 to 20%. Barley with high humidity is poorly stored and has low germination, which requires additional drying [3]. For better storage, barley moisture content should be below 15%.

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The remaining compounds are carbohydrates (70.0-85.0%), proteins (10.5-11.5%), minerals (2.0-4.0%), fats (1.2-2.0 %) and other substances (1.0-2.0%).

The main carbohydrates in barley grains are sugar, starch, cellulose, as well as hemicellulose, pectin and gummy substances.

Glucose and fructose are dominant among monosaccharides in barley grain, and sucrose is dominant among disaccharides. Sucrose is mainly found in the seed coat and aleurone layer, fructose and glucose in the endosperm.

Polysaccharides are composed of starch, hemicellulose and cellulose. Compared to rice and corn, barley has less starch and more hemicellulose (Table 1.) [3].

Table 1

Comparative description of cereal crops by the content of polysaccharides (g/100 g product containing 86% QM)

Polysaccharides	Barley	Rice (grain)	Rice flour	Corn (grain)
Hemicellulose	6.7	4.1	-	4.2
Fiber	4.3	9.0	0.4	2.1
Starch	48.1	55.2	70.7	56.9

Phenolic compounds have also been detected in barley grains, and their amount can range from 0.1 to 0.3%, depending on the variety, climatic conditions and degree of maturity. These substances are found mainly in the aleurone layer and in the grain husk. In particular, gallate, pyrocatechin, gentisin, p-hydroxybenzoic, vanilla, coffee, p-coumar, ferul, cinnamon, chlorogenic acids, as well as flavoring substances and anthocyanins were detected in barley grains.

The mineral content of barley varies between 2-3%. The main mineral substances of barley are potassium, calcium and magnesium phosphates.

Phosphates are not only the main constituent of mineral substances and their compounds; their presence in barley grain plays an important role in the formation of organic compounds (for example, phytin, nucleic acids, coenzymes, proteins, etc.).

Barley grains contain vitamins B_1 (thiamine), B_2 (riboflavin), E (tocopherol), folate and ascorbic acid, as well as many enzymes.

Barley has long been used in folk medicine to treat respiratory, gastrointestinal tract, excretory system and other diseases. Barley decoction is used for fever, cystitis, colds, as well as expectorant, anti-inflammatory, diuretic.

Ibn Sina wrote about the beneficial properties of barley for the human body in his book "The Laws of Medicine". He noted that barley has cleansing properties. Hot barley ointment gets rid of freckles, and a gruel made with resin in water is used as a medicinal ointment for hard tumors. Ibn Sina believed that a decoction of barley in vinegar in the form of a medicinal ointment cures scabies, and an ointment made of barley with quince and vinegar cures gout [4]. It also describes barley as an important ingredient in many recipes used to treat various ailments.

Ibn Sina also mentioned the usefulness of barley water in fever. Pure barley water is consumed in hot fever. It is used for cold fever with celery and fennel. In phlegmatic fever, barley tincture is drunk with fig and honey water [4].

Even now, barley grains are used as a dietary and healing agent. Studies have shown that regular consumption of whole barley grains reduces the risk of developing diseases such as chronic heart disease, colon cancer, high blood pressure, type 2 diabetes, obesity, gallstones [5]. Barley has good diuretic activity and is useful for urinary tract infections [4].

Soluble fiber in barley - β -glucan binds to bile acids in the intestine and thereby reduces plasma cholesterol levels, slows down the absorption of sugar in food, helps control blood

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glucose levels in type 2 diabetes, reduces cholesterol synthesis by the liver, and cleans blood vessels. Thus, it helps in cardiovascular diseases and reduces the risk of their development. Insoluble fiber provides intestinal bulk, which leads to a feeling of fullness and a decrease in appetite. It improves bowel movements, relieves constipation, cleanses the colon of harmful bacteria and reduces the incidence of colon cancer [6]. Increasing the consumption of fiber in patients diagnosed with colorectal cancer may provide additional benefits in the treatment of patients [1].

The beneficial effects of barley on the digestive organs, especially the intestinal tract, have been proven in animal experiments. Barley products enriched with dietary fibers showed various beneficial physiological and protective effects in the intestinal tract of rats [7].

Barley is widely used in various fields, in particular, in the preparation of perlovka and barley groats, coffee substitute, flour for baking. In rare cases, bread is baked from it, because it does not rise well, it turns out to be less porous, and it spoils quickly due to the low content of gluten. Grain is the main raw material for the brewing industry, and together with barley straw, it serves as a concentrated animal feed. In the southern regions, barley is sometimes mixed with peas and mash as a green feed [8].

Conclusion

The above-mentioned review of the literature shows that the object of research - common barley is not only widely cultivated in the territory of our republic, but also a source of valuable biologically active substances. However, since common barley has not been fully studied, its use has not been scientifically proven to date. Taking into account the results of pharmacological studies confirming the sufficient raw material base of ordinary barley, the high content of polysaccharides in the grain, and its effectiveness in the treatment of gastric ulcer diseases, a deep pharmacognostic study of this plant is of great practical importance. This dissertation work is aimed at solving this issue.

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