1st Edition

HERBS TO TREAT DIABETES

THE MOST USEFUL MEDICINAL HERBS TO TREAT DIABETES

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Introduction

Today, the incidence of diabetes mellitus is one of the global medical and social problems in the healthcare system of the world. According to the International Diabetes Federation, the number of patients with diabetes mellitus in 2007 was 146 million, and by 2025 it will increase to 380 million, of which 90 % are patients with type 2 diabetes mellitus (DM 2).

However, with all the advances in the diagnosis and treatment of diabetes mellitus, the severity of the problem in the 21st century has not diminished, but, on the contrary, is increasing. According to the World Health Organization, there are currently more than 150 million people in the world suffering from this disease. According to experts, by 2016 this

figure will increase to 250 million, and this trend will continue in the future. More than 10 million diabetes patients are officially registered in Russia . The importance of the problem is indicated by the fact that among the causes of death from somatic diseases, diabetes and its complications rank third after cardiovascular and oncological diseases.

The medical and social significance of diabetes mellitus is determined by the numerous severe complications of the disease, high disability and mortality. All this determines the unusually high economic costs of treating diabetes mellitus and complications, which are growing every year and make up from 7 to 13 % of healthcare in many countries of the world. Russia spends more than $ 160 million annually on the purchase of insulin, since there are still no sufficient capacities for the production of the active substance of human insulin in Russia. Against the background of the negative history of Russian insulin production, specialists remain wary of innovations in this area.

Today, state policy on diabetes mellitus is predominantly focused on improving medical care for patients and very little is being done to implement preventive and rehabilitative programs. The population does not have sufficient information about the danger of socially significant diseases, including diabetes mellitus.

According to the forecast of WHO experts, by 2030 more than 380 million people will suffer from diabetes in the world . Such a meteoric rise in morbidity is expected mainly due to an increase in the number of patients with type 2 diabetes, developing as a result of growing urbanization and related problems - unhealthy lifestyles, low physical activity, inadequate diet and stress.

Russia, along with India, China, the United States and Japan, is one of the five countries with the highest incidence of diabetes. Currently, about 3 million people with diabetes mellitus are officially registered in Russia . However, according to the data of control and epidemic studies, their number exceeds 8 million. In terms of the number of deaths in

Russia, diabetes firmly holds the third place after cardiovascular and oncological diseases.

Unfortunately, despite the data of the 20-year UKPDS study, which showed that intensive therapy with type 2 diabetes led to a significant reduction in the risk of developing various complications and mortality, the problem of therapy and glycemic control of diabetes remains very relevant today throughout the world.

International diabetics organizations are now offering more stringent targeted glycemic control programs. In 2006, Russia adopted criteria for compensating for type 1 and type 2 diabetes, which are close to the indicators of carbohydrate metabolism in healthy individuals (algorithms for specialized medical care for patients with diabetes, Moscow, 2006).

Currently, a very wide arsenal of “hypoglycemic” drugs with various pharmacological and pharmacodynamic effects aimed at eliminating the main metabolic disorders leading to hyperglycemia (impaired insulin secretion, insulin resistance, excess glucose production by the liver, slowing glucose absorption in the small intestine) , stimulation (glucose-dependent) of insulin secretion and simultaneous suppression of glucose release).

When assessing the feasibility of methods of pharmacotherapy for metabolic syndrome, N. Yu. Kolgina and GA Bazanov (2008) found that beta-blockers and thiazide diuretics, widely used to treat hypertension, cause the progression of tissue insulin resistance.

Drugs used to treat type 2 diabetes are currently divided into several classes: insulins, sulfonylurea derivatives, biguanides, alpha-glucosidase inhibitors, PPA RJ agonists (thiazolidinediones), meglitinides (glinides, prandial glycemic regulators), peptide analogs of glucogone-like 1 , gliptins (DPP-IV inhibitors), amylin analogs, combined preparations.

Complex individually oriented therapy of diabetes mellitus allows to achieve compensation of metabolic disorders, prevents the progression of the disease and the development of complications. However, to a large extent, its

success depends on the efforts of the patient himself, on the social and living conditions in which he lives, on the attitude of the people around him to him. Progress in the fight against this serious ailment cannot be achieved without efforts to develop a healthy lifestyle from childhood.

Many symptoms of the disease can be leveled or weakened if a patient with diabetes mellitus eats rationally, mindful of the diet and resorting to a wide range of herbal remedies. The patient can prepare some therapeutic and dietary products and dishes himself with certain advice and diet correction from an endocrinologist or phytotherapist.

According to economists, each ruble invested in prevention brings 8 rubles in savings. An expert council on preventive medicine has been established under the Health Protection Committee of the State Duma of the Russian Federation. A healthy lifestyle, proper nutrition and physical culture should be promoted as a tool to protect against all diseases. Herbal medicine can be of help in this complex and multifaceted work. Insufficient awareness of the population about the causes, prevention, treatment and consequences of diabetes is typical not only for Russia, but also for other countries of the world.

The threat of the diabetes epidemic dictates new strategies for the treatment and prevention of the disease. The main danger of type 2 diabetes is that for the time being it does not manifest itself in any way. Many patients have no symptoms of the disease. Only when the complications become irreversible and such a patient is admitted to the hospital with a heart attack or stroke, it turns out that he has been suffering from diabetes for a long time.

For phyto-dietary purposes, patients with type 1 and type 2 diabetes mellitus may benefit from such wild plants as nettle, dandelion, primrose, plantain, burdock, chicory, St. John’s wort, calamus, horsetail, knotweed, cinquefoil, wheatgrass, panicle wormwood, elecampane, oregano, etc.

At the recent international symposium on wild plants and their practical use, including in medicine, held in Pushchino (Moscow Region), reports on the use of Jerusalem

artichoke in the dietary recovery of patients with diabetes mellitus were of considerable interest. At present, thanks to the enthusiasm of Professor V.N.Zelenkov and his associates, numerous and rather tasty products containing Jerusalem artichoke roots have appeared on the table of patients.

To brighten up the taste of phyto-dietary products for patients with diabetes mellitus, you can recommend them dishes with the addition of apricots, viburnum, mountain ash, cranberries, black and red currants, thorns, quince, gooseberries, persimmons, lingonberries, sea buckthorn, blueberries, blueberries, rose hips, irgi, honeysuckle and etc.

Patients with diabetes mellitus benefit from birch sap, blended (mixed) with tincture of St. John's wort, lemongrass, zamaniha, centaury, infusion (decoction) of blueberries, lingonberries, chicory, rose hips, nettles, etc.

Vegetable juices from cucumber, green peppers, onions, potatoes, tomatoes, beets, cabbage, carrots, green beans, plantain, etc. can also be beneficial.

At present, a turning point is taking place in the minds of people, they are beginning to return to their previous knowledge, although from a scientific and medical point of view, this knowledge often seems primitive. Despite the fact that the World Health Organization (WHO) very persistently and specifically asks for help from everyone who knows and applies traditional methods of treatment, unfortunately, barriers are still, unfortunately, quite often put between "scientific" and "unscientific" methods of treating diseases … But every educated person knows how many scientific dogmas, seemingly thoroughly documented, have not passed the test of time and were rejected as erroneous and useless. Therefore, it should not be surprising that many patients seek help from doctors who use biological therapies that affect the entire body simultaneously.

In modern medicine, medicinal plants not only have not lost their positions, but are attracting more and more attention from scientists and doctors. Of the more than 15 thousand drugs registered in Russia, about 40 % are produced from plant materials. Their number is increasing every year.

Currently, the centers for the study of herbal remedies and the development of new dosage forms for the treatment of patients with diabetes mellitus are Moscow, Samara, Volgograd, Tomsk, Ulan-Ude, Dushanbe, where phytopreparations such as novobet, arfazetin, galegamine, topivit, concentrate were created. Jerusalem artichoke, galega-nova, diacor, diabetta, etc.

General issues

From the history of herbal medicine for diabetes

The history of a disease called “diabetes” has its roots in the 3rd century BC. e. It turns out that the Jews knew about

this disease back in the days of the Second Temple. Many doctors tried to find some way to treat diabetes, and they could also determine the symptoms of diabetes, but they did not know the cause of the disease. Therefore, in those days, people who were diagnosed with this unfavorable for them were doomed to death. Translated from Greek, the word “diabetes” means “outflow”, “pass through”, and therefore the expression “diabetes” literally means “losing sugar”. This reflects the main symptom of the disease - the loss of sugar in the urine. The very term “diabetes” was first introduced by the Roman physician Aretheus. He described the disease as follows: “Diabetes is a terrible suffering, not very common among men, dissolving the flesh and limbs into urine. Patients ceaselessly emit water in a continuous stream, as through open water pipes. Life is short, unpleasant and painful, thirst is insatiable, fluid intake is excessive and not commensurate with the huge amount of urine due to even greater diabetes. Nothing can keep them from taking fluids and passing urine. If they refuse to take fluids for a short time, their mouth dries out, the skin and mucous membranes become dry. Patients are nauseous, agitated and die within a short period of time.

In the manuscripts, books, collections “Karabadin kebir”, “Mahsanul edvia”, “Tohvatul mominin”, which were used by folk healers, nushadars, in the “Canon of medical science” Avicenna provides numerous information about the use of many herbal remedies for diabetes.

Diabetes mellitus called “gchin-snya disease” is described in detail in the 13th century Tibetan medical treatise “Chzhud-Shi”. Already in those days, Tibetan medicine successfully treated this disease, and today, diabetes is practically not found among Tibetans. The secret of this phenomenon is in the special methods of treating endocrine problems used by Tibetan doctors. Diabetes treatment is carried out depending on the scenario of the disease: as a “fever” disease due to a violation of the vital basis of Mkhris, or as a “cold” disease. In the first case, treatment is aimed at cleansing the liver, biliary tract and blood. If the disease has arisen as a “cold” due to a disorder of the vital basis of Badkan, experts use procedures and herbal medicine to

normalize metabolic processes, including fat metabolism, enhance digestion, increase the body's energy, and eliminate fatty infiltration of internal organs. If there are disorders of the nervous system, means are used to eliminate them and harmonize the psycho-emotional background in combination with warming procedures.

In the 18th century, the sweet taste of urine was first discovered in patients. This feature was revealed by the English doctor Dopson, and from that date, diabetes, in fact, began to be called sugar. Later, doctors used this symptom to diagnose the disease. In 1841, a method for determining sugar in urine was first developed, and then they learned to determine the level of sugar in the blood.

A special diet for patients was proposed, in which part of the carbohydrates was replaced by fats. Exercise has also begun to be used to treat diabetes.

In 1889, microscopy of the pancreas revealed characteristic clusters of cells that were named islets of Langerhans, after the scientist who discovered them. But their significance for the body could not be explained. In 1921, researchers Basting and Best managed to obtain insulin from the tissue of the pancreas, which in a dog with diabetes mellitus eliminated the signs of the disease. And already in the next year insulin was successfully used for the first time in the treatment of patients with diabetes mellitus.

Among the means and methods of treating patients with diabetes mellitus, herbal preparations play a certain role. Since ancient times, medicinal plants have been empirically used in the treatment of patients with diabetes mellitus - blueberry leaves, walnut and Manchurian leaves, bean husks, goat grass, etc. (S. Ya. Sokolov, IP Zamotaev, 1993).

Already at the earliest stages of human development, plants were not only a source of nutrition for people, obtaining clothing, tools and protection. They helped a person get rid of diseases. Studying archaeological finds, ethnographers have established that there was no such tribe on earth that did not know medicinal plants.

Already in primitive society, the analgesic properties of plants of the Solanaceae family, plants acting on the digestive tract, and some narcotic drugs are known. Trade and wars contributed to the spread of information about medicines and led to the mutual enrichment of medical knowledge among the peoples of different countries. With the invention of writing, this information was first recorded on cuneiform tablets. Sumerians in the third millennium BC e. have already used in their practice such medicinal plants as mustard, thyme, plum, pear, fig, etc.

The flora of Southeast Asia, India and China for many millennia has served as a source of medicines for the treatment of a wide variety of diseases, including diabetes. More than 5000 years ago, the book “Ben-tsao” was published in China, which provides information about ginseng, ephedra, asparagus, dogwood, astragalus and a mixture of several plants (MA Kuznetsova, AS Reznikova, 1992). In India, there are 24 native plants (garlic, onion, dandelion, etc.) for the treatment of diabetes, lowering blood sugar levels (E. Chako, 2003).

Particularly valuable information about the use of medicinal plants was read in ancient written monuments - Egyptian papyri. The ancient Egyptian papyrus of Georg Ebers contains excerpts about the use of about 800 plants in the form of various dosage forms: infusions, decoctions, juices, poultices, etc. The Egyptians knew very well about the medicinal properties of aloe, anise, henbane, mint, castor oil plant, plantain. They suffered from many ailments. In order to prevent them, it was recommended to use enemas, diaphoretic, fixing agents as often as possible. For the prevention of intestinal diseases, it was recommended to drink filtered water, since then they knew about the possibility of transmission from one person to another of some intestinal infections, such as dysentery.

The outstanding physician and thinker of Ancient Greece, Hippocrates, created the doctrine of the causes of diseases and methods of their treatment using numerous plants. He described 236 plants, the significance of which for gastroenterology is not lost today. These are elderberry, iris, centaury, almonds, mint, etc. He believed that medicinal plants

owe their action to a certain, optimal combination of all constituent parts, and therefore plants should be used in the form in which nature created them, that is, in natural or in the form of juices. He wrote: “Medicine is the art of imitating the healing effects of nature.” Hippocrates often used, along with a diet, banks and baths, and the diagnosis was based on observations of patients. By doing so, he turned medical “art” into a science.

The Greek physician of the Roman army of the time of Nero Dioscorides is considered the father of European pharmacognosy, who described many of the plants he knew in the essay Materia medica, which for centuries served as a reference book for doctors and pharmacists. In his books, he described about 6,000 plants, gave their names, spoke about the methods of preparing medicines, their dosage and effects.

According to legend, in the Caucasus (Colchis), under the patronage of the goddess Artemis, there was a magical garden of poisonous and medicinal plants, from where these plants came to Greece.

The ancient physician Claudius Galen, in contrast to Hippocrates, believed that some of the active substances of plants have a healing effect, and the other - harmful. To separate them, he suggested separating some substances from others by insisting on wine, vinegar, and water. Extracts from medicinal plants have gained popularity in all European countries and are now widely used under the name “galenic preparations”. Galen improved a number of dosage forms. In particular, the so-called teriaki appeared - antidotes to plant and animal poisons. If we translate the meaning of these phytocompositions, then Galen not only knew about the toxic properties of plants, but also developed a whole system of endodetoxication, used remedies for treating stomach and intestinal disorders. Some balsams included up to a hundred constituent parts, among which plants predominated, but there were also honey, snake meat, horns, etc. His teachings existed until the 18th century. Some of the balms are now introduced into the domestic pharmacopoeia and are used as tonic (Amrita, Pervoprestolny, Kedrovit, Altai, etc.), gastric

(Bekherevka), multivitamin (Herbamarin, Korfit “And others) funds.

After Hippocrates, Galen was the last great exponent of the magnificent flourishing of medicine in Europe. The medieval period in Europe was characterized by a stagnation in the field of medical knowledge. Only in the XI century there was a certain revival of science and its gradual entry into a new phase of development. Clergymen stood at the cradle of cultural and scientific thought. The written heritage of the achievements of the ancient world has been preserved in the monastery libraries, and this circumstance contributed to the emergence of monastery medicine. The monks were commissioned to study the works of Hippocrates, Dioscorides and Galen. The collection of information about folk remedies began, and they gradually returned to the rich experience of previous generations. To a certain extent, this was facilitated by the wide spread of plague epidemics and other serious and often fatal diseases.

The brilliant medieval Tajik doctor - encyclopedist Abu Ali ibn Sina (980-1037) left a rich heritage for world civilization, covering more than twenty branches of science, such as philosophy, medicine, mathematics, literature and poetry, pedagogy, music, and a number of other branches of science , testifying to the extraordinary breadth of his scientific interests.

The medical heritage of Ibn Sina (Avicenna) covers over fifty branches of theoretical and practical medicine, which were developed differently. Such branches of medicine as therapy, surgery, traumatology, especially hygiene, pharmacology and drug science, were systematized in the legacy of the scientist, starting with general issues of the problem and ending with specific questions and links with other related disciplines. Modern endocrinologists wrote about the scientist’s contribution to diabetology in general terms without analyzing the general tactics of treatment, as well as dozens of antidiabetic drugs recommended by Ibn Sina.

To solve this problem, we used such works of the scientist as “The Canon of Medicine”, the treatise “Alvohia” -

“The Code of Prescriptions”, “Treatise on Hygiene” and some other works of the scientist, written in Arabic and Farsi-Tajik.

An experienced doctor associated the causes of diabetes in the modern concept of diabetes risk factors with intrarenal, intrahepatic factors, as well as “hot unnatural force without matter or with matter” (toxic diabetogenic substances, according to Yu. N. Nuraliev (2004). Medicine of the Avicenna era did not know about acid-base resources, biochemical composition of blood, urine and other body fluids.

There are dozens of undisclosed physiological mechanisms deep in the tunnel. Avicenna, many centuries ahead of the achievements of science of his era, was able to correctly figure out the cause of diabetes, “with a hot unnatural force with matter.”

It has now been proven that the increased concentration of urates (uratosis) refers to the so-called renal diabetogenic factors. Urates and the product of their metabolism, alloxan, belong to those unnatural substances that Ibn Sina wrote about (Yu. N. Nuraliev, M. U. Sharofova, 2005–2011).

Until the 19th century, medicine considered diabetes to be a kidney disease. A similar explanation was associated with the state of uratosis, often preceding diabetes, in which intrarenal disorders occur much earlier than the development of diabetes mellitus.

Modern medicine has no information about the diet of the inhabitants of Central Asia, including Iran, in the era of Avicenna. An analysis of the scientist’s works devoted to gout, urolithiasis and gallstone disease, various types of polyarthritis and diabetes, shows that due to the abundance of wild animals and birds, the diet of people mainly included animal fats and meat products. Therefore, diseases associated with uratosis and hyperuricemia were considered the most common.

The general scheme of diabetes treatment developed by Ibn Sina consisted of diet therapy, drug therapy, and physiotherapy. Sugar products, animal fats, rough meat (beef, lamb) products were excluded from the diet of diabetics.

Diabetics' diet consisted of wheat broth, broth of barley, jelly and jellied meat from internal fat and meat of one-year-old kids. Ibn Sina recommended various fruit and berry (pomegranate, plum, mulberry, etc.), as well as vegetable (cucumber) juices and fermented milk whey as therapeutic and diabetic means.

When prescribing simple or complex antidiabetic drugs, Ibn Sina took the following leading symptoms of diabetes as a basis: thirst and polyuria, disorders of the kidneys, liver, nervous and cardiovascular system, body misajah (nature), as well as muscle (myalgia) observed in diabetes, neuralgic pain and itching of the skin.

In accordance with the Avicenna treatment system, diabetes treatment was carried out using the following means:

• medicinal food plants, that is, herbal remedies or phytotherapy;

• mineral products or mineral therapy;

• animal remedies - organotherapy.

Herbal medicine was considered the leading treatment for diabetes. In the "Canon" of Ibn Sina and in a number of other treatises of the scientist, a total of 84 names of potential antidiabetic, including thirst-relieving agents, are described, among which there are 75 herbal products, which is 89.3 %. Gums and resins (gum resins) among herbal remedies make up 9 units, or 14.3 % of the total number of herbal products.

From the composition of 75 thirst-quenching or thirst-calming herbal remedies, Ibn Sina, by simple technological processing, could obtain from 75 to 250 or more simple phytopreparations (infusions, decoctions, powders, oil or alcohol extracts, etc.).

The classic antidiabetic drugs described in the writings of Ibn Sina, as a thirst-calming agent, include: marshmallow, aloe, common anise, acacia, artichoke, common barberry and other types of it, mad cucumber, camel thorn, grape clove, galega tree, common pomegranate, oregano dikmamp and its other types, iris iris, evergreen cypress, Chinese cinnamon and

its other types, coriander, white water lily and its other types, incense, creeping cinquefoil, lettuce, field mint and its other types, plantain flea, purslane garden, Kazanlak rose and its other types, medicinal chamomile, tannic sumac, naked licorice, white beans, common beans, fragrant violet, saffron, thyme, etc.

In the 11th – 12th centuries, universities in Salerno, Bologna, Paris, Padua, Oxford, and others were the centers of medieval medicine in Europe. Around 1480, the first edition of the Salerno Code of Health by Arnold of Villanova appeared. In it you can quite often find certain phytocompositions that alleviate the condition in diseases of the stomach and intestines. “There is an opinion that saffron gives both comfort and vigor; he pours strength into the members and renews our liver. ”

In 1485, the herbalist Apuleius Platonist Herbarium was published in Latin and only later was translated into national languages, which made a great contribution to the popularization of knowledge about herbs.

During the late Middle Ages, the teaching of the doctor Paracelsus had a great influence on the development of the science of medicinal plants. He viewed life as a certain chemical process, the course of which depends on the composition of the substances involved in it. The disease, in his opinion, occurs in the absence of the necessary substances, therefore the essence of the treatment consists in the introduction of the missing chemicals into the body.

In the choice of medicinal plants, Paracelsus adhered to the doctrine of signatures that arose in antiquity. According to this teaching, signs of appearance (color, shape, smell, taste, thorns) indirectly indicate the disease in which it should be applied. So, if the plant has a yellow color (celandine, tansy, goldenrod, etc.), then it was considered (and even now) a remedy for diseases of the liver and biliary tract. The doctrine of Paracelsus about the active “principles” of plants later served as a stimulus to the study of the chemical composition of plants.

For the first time, the rationale for the use of medicinal plants for liver disease was given at the end of the 15th century. Later, starting from the XVI-XVII centuries, immortelle flowers began to be attributed to choleretic agents (L. S. Levinson, 1930).

In medieval medicine, a number of herbal remedies are mentioned that relieved the condition of patients. Among them, you can find those that have not lost their practical significance at the present time. In the book by A. Amasiatsi "Unnecessary for the Ignorant" (1990), it is said about the pharmacy chamomile: "… It helps with colic and swelling of the intestines and liver, softens solid tumors and soothes pain. And also helps with all inflammatory, mucous and black-bile fevers … "

Avicenna, an outstanding representative of Arab and Central Asian medicine, wrote about forty works on medicine. His work "Canon of Medicine" has been used by doctors in many countries for centuries. And now it contains a storehouse of information about medicinal plants.

In the Old Russian language, "belly" - the receptacle of the digestive organs - is a synonym for the word "life", and it is quite understandable why. Indeed, in Russia, as in other peoples, the healing properties of plants have been known since ancient times. The pagan worldview that prevailed in Ancient Russia gave the treatment a supernatural character. Therefore, treatment with a small set of medicinal herbs was carried out by healers, sorcerers, wise men, that is, people, according to folk concepts, who know how to act on evil spirits.

In Russian traditional medicine, the inflorescences of St. John's wort, immortelle, tansy in the form of a decoction were used for various inflammatory diseases of the liver, bladder and urinary tract, as well as an antihelminthic agent (ascariasis) and as a hemostatic factor.

In the encyclopedia of traditional medicine of Russia "The Verb Book Cool Vertograd" (1997), field grass (mint), St. John's wort, sorokobratov (tansy), timon (thyme), ramon color (chamomile), svoroborina (wild rose), pelyn, chernobyl (

wormwood), popava (dandelion), fenkula (dill), etc., which were widely used and are now used in modern hepatology. It quite often mentioned such diseases as “baked pains, icteric infections, stitches, baked edema”, which belonged to various liver diseases. “Rhubarb is pleasant, black torpor from bile, as well as harmful wetness, and it will cleanse the stomas, and the liver, and will take away the stinging that happens in the heart.”

The word “vertiograd” means “garden”, here - a garden of medicinal herbs. This book is a translation of a medical book popular in the 15th century in Western Europe with extensive additions included by Russian scribes.

After the overthrow of the Tatar yoke, Russia resumes contacts with Western Europe. Scientists, architects and doctors are invited to the royal service. The study of medicinal plants in Russia began to develop noticeably after the reforms of Peter I. By his order, state pharmacies and bases for them, the so-called pharmaceutical gardens, were opened. One of them, the St. Petersburg Apothecary Garden, has turned into a botanical garden, now transformed into the Botanical Institute of the Russian Academy of Sciences. The Academy of Sciences, created by Peter I, organized expeditions to study and procure plant resources in Siberia.

The traveler and naturalist, student of M. V. Lomonosov, member of the St. Petersburg Academy of Sciences I. I. Lepekhin studied the flora of Russia for about six years. In his essay “Reflections on the need to test the power of one’s own growth,” he described many plants that have medicinal properties. The scientist urged doctors to study plants, “endowed with healing power.” “A new light would illuminate the art of medicine, - wrote II Lepekhin, - if we knew the power and action of plants.”

Many naturalists strove to generalize and analyze the folk experience of using medicinal plants and saw this as a great scientific feasibility and perspective. NI Annenkov’s “Botanical Dictionary” included 3500 medicinal plants.

The eminent Russian scientist N. M. Maksimovich-Ambodik wrote that “the medicinal use of plants is well

known not only to doctors, but also to curious people, for many of the best, safest and most effective medicines, as well as the best and healthiest food from plants, are prepared" … He perspicaciously pointed out that "I can boldly say that if all doctors and healers were thoroughly and diligently repeated experiments to test the power and action of plants vegetating in their homeland, then they would hardly need to prescribe new ones, exported from foreign countries, expensive, but sometimes completely inactive medicinal substances. " It would not be an exaggeration to say that these words have not lost their meaning in our days.

In 1915, the Japanese physician Saito published the positive results of treating diabetics with ginseng. Since then, numerous experiments have been carried out on various animal species, confirming the increase in carbohydrate tolerance under the influence of ginseng; reduction of alimentary, stress and adrenaline-inducing hyperglycemia; therapeutic effect in alloxan diabetes, as well as in partial extirpation of the pancreas (O.D. Barnaulov, 2001).

Herbal medicine and dietetics have acquired the rights of citizenship in scientific medicine today, and the period of neglect of herbal remedies at the beginning of the 20th century was caused by the intensive development of chemistry and the rapid growth in the production of synthetic medicines. Chemicalization, widespread introduction of various additives in food (stabilizers, flavorings, sweeteners, dyes, etc.) and in medicine entailed a departure from nature. And therefore, the tireless efforts of those seeking to recreate therapies tried and tested over millennia should now be greatly appreciated.

At present, a certain turning point is taking place in the minds of people, they are beginning to return to their previous knowledge, although from a scientific and medical point of view this knowledge often seems primitive. Centers of natural therapy, cybernetic, complementary, natural medicine, centers, offices, courses and departments of herbal medicine began to appear more often. The World Health Organization (WHO) very persistently and specifically asks for help from everyone who knows and applies traditional methods of treatment, but, unfortunately, barriers are still often raised between

“scientific” and “unscientific” methods of treating diseases. But every educated person knows how many scientific dogmas, seemingly thoroughly documented, have not passed the test of time and were rejected as erroneous and useless. Therefore, it should not be surprising that many patients seek help from doctors who use biological therapies that affect the entire body simultaneously.

In modern medicine, medicinal plants not only have not lost their positions, but are attracting more and more attention from scientists and doctors. Of the more than 15 thousand drugs registered in Russia, about 40 % are produced from plant materials. A significant part of them are used in the treatment and prevention of diabetes. Their number is increasing every year.

Currently, the centers for the study of herbal medicines and the development of new dosage forms for the treatment of diabetes mellitus and its complications are Kharkov, Moscow, Samara, Tomsk, Ulan-Ude, where phytopreparations such as abisib, populin, tanaxol, arfazetin, phytobet were created. , belacekhol, piflamine, eighteen chaga compositions, sanguirithrin, rotocan, polyphytochol, etc.

Rationale for herbal medicine for diabetes

Pharmacodynamic actions of plants are the main actions caused by medicinal substances contained in plants. The actions due to which plants are used in medicine is a list of the pharmacological effects of the plant, allowing it to be used for the treatment, prevention of diabetes mellitus, using it as stimulating, etiotropic, pathogenetic, symptomatic, replacement, prophylactic or general strengthening (metabolic) elements.

According to the modern classification (1999), there are four forms of diabetes mellitus. Chief among them are:

1) type 1 diabetes (diabetes I), or insulin-dependent diabetes;

2) type 2 diabetes (diabetes II), or non-insulin dependent diabetes. Moreover, diabetes II occurs 9 times more often than diabetes I.

The basis of the treatment of diabetes I is the administration of insulin preparations against the background of a diet and diet with rational physical activity and self-control of patients. Treatment of diabetes II consists mainly of therapy with hypoglycemic drugs, less often insulin or a combination thereof, as well as diet, proper organization of the nutrition process and dosed physical activity against the background of self-control. Taking into account the peculiarities of the course of this form of the disease, the importance of dietary recommendations, the role of the use of medicinal plants, the use of food additives is more significant. In some cases, only the use of a diet and / or collection of medicinal plants can compensate for the treatment of diabetes II, significantly improving the quality of life of patients. This does not mean that herbal medicine cannot be used in patients with type 1 diabetes. True, in this case, it is assigned the role of an auxiliary method of treatment, providing, first of all, the prevention of late, rather serious complications of this disease.

The use of herbal medicine, which, of course, is not a substitute for special therapy, allows a specialist to solve certain problems. The use of medicinal plant preparations (decoctions, infusions, tinctures):

• partially reproduces or enhances the effects of a number of oral antidiabetic drugs, with a possible reduction in their dose and possible side effects;

• promotes the synthesis of insulin, optimizing its action at the tissue level;

• stimulates the processes of regeneration of beta cells of the pancreas, an insulin producer;

• improves the work of all links of the body’s immune system;

• normalizes secondary metabolic disorders in general and hormones in particular;

• provides prevention of complications from the cardiovascular, nervous, musculoskeletal, urinary and other systems of the patient's body.

Let's dwell on this in more detail. Medicinal plant preparations reproduce, to one degree or another, the effects of therapy, improve the absorption of glucose by tissues. Researchers attribute this to the action of plant substances called glycokinans. Using preparations or collections from the herb of goat's rue (galegi), bean shells, blueberry leaves, etc., it is possible to reproduce in the body effects similar to the action of hypoglycemic drugs such as biguanides. This is manifested in the optimization of the action of insulin as a result of its protection from the action of enzymes. The inclusion of "protected" insulin in metabolic processes solves the problem of hormonal deficiency and normalizes impaired carbohydrate metabolism without prejudice to the synthesis of proteins and fats in the body.

Plants containing trace elements, zinc and chromium, stimulate the processes of insulin synthesis and promote its normal interaction with tissue receptors. Preparations and / or collections containing mountain arnica flowers, birch leaves and buds, knotweed grass, corn silk, bay leaves, ginger, sage grass, provide these effects.

There are medicinal plants that allow the assimilation of carbohydrates in a different way. These are mainly inulin-containing raw materials - roots of elecampane, dandelion, Jerusalem artichoke, chicory. The use of cold infusions prepared on their basis leads to the formation of fructose, which is absorbed in a different way than conventional glucose.

Regeneration of the cells of the pancreas responsible for the production of insulin can be ensured by the introduction into the body of preparations of flax seed, burdock and licorice roots, blueberry leaves. These effects have been confirmed experimentally.

With the help of plant preparations - adaptogens: ginseng, lemongrass, eleutherococcus, etc. - hormonal and metabolic processes are regulated. This phenomenon has been known to medicine in the East since ancient times and is confirmed by extensive clinical observations of modern doctors.

Medicinal plant preparations can also improve the supply of oxygen to tissues (linden, dried weed, arnica, etc.), remove excess glucose and salts in the body with urine (cornflower, birch, kidney tea, bearberry, horsetail, etc.), increase the activity of the body's defenses (plants-immunomodulators).

It should be remembered that medicinal plants and preparations from them, as a rule, have a polyvalent, multifactorial effect. This allows you to simultaneously solve several problems with a minimal risk of toxic and allergic complications.

Undoubtedly, the possibilities of phytotherapy in diabetes mellitus are quite wide and have not yet been sufficiently appreciated. The only question is the rational selection of collections or individual plants, as well as the correct preparation of phytopreparations and their use by specific patients under the supervision of specialists - phytotherapists.

Currently, both raw materials and ready-made preparations of medicinal plants, including in filter bags, and dietary supplements for patients with diabetes from Russian manufacturers are widely represented on the domestic pharmaceutical market.

Currently, in medical practice, more than two hundred medicinal plants are used that have a sugar-lowering effect. Along with food ingredients (proteins, lipids, carbohydrates, vitamins, microelements), the composition of plants also includes biologically active substances, among which the leading role is played by hypoglycemic compounds (galegin, inosine, inulin, etc.). Some medicinal plants have the ability to simultaneously affect many organs and systems of the body, which makes it advisable to use multicomponent collections.

There are several provisions explaining the mechanism of the hypoglycemic effect of plants in diabetes mellitus, confirmed by clinical observations and experimental studies.

Medicinal plants **cannot** completely replace antidiabetic drugs. Medicinal plants can be combined with a diet used as monotherapy (adult diabetes compensated only by diet), exercise, as well as with antihyperglycemic drugs under constant medical supervision.

Analysis of the world literature leads to some hypotheses explaining the mechanism of the hypoglycemic action of preparations from herbal medicinal raw materials:

• Plant substances enrich the body with alkaline radicals. In a weakly alkaline solution in the presence of Ca (OH) 2, glucose can spontaneously convert to mannose, which does not require insulin for assimilation, which can indirectly reduce the need for exogenous insulin.

• A number of plants (galega, beans, peas, etc.) containing a galegin derivative of guanedoisomalein act like biguanides in the biosynthesis of urea.

• Under the influence of a number of phytopreparations, the restoration of the beta cells of the pancreas, which produces insulin, is enhanced, and the regeneration of insulin-producing cells in the Langerhans islets of the pancreas occurs.

Some medicinal plants, along with hypoglycemic, have an immunocorrective effect, which is often required in the complex therapy of patients with diabetes. Eleutherococcus, ginseng, zamaniha, aralia, lemongrass, rhodiola, leuzea, etc. have immunocorrective properties. Like insulin, they increase the level of GMF in the liver and muscles, exerting an insulin-like effect. Under the influence of phytopreparations with a tonic effect, the central and autonomic nervous system is activated in patients with diabetes mellitus. Through the vagus nerve, a stimulating effect is exerted on the pancreas, as a result of which insulin secretion increases. Through the vagus nerve, there is a stimulating effect on the pancreas, as a result

of which insulin secretion increases and complications during insulin therapy for diabetes decrease (Table 1).

Table 1

Possible complications of diabetes mellitus and their phytocorrection

Many plants, due to the content of substances with a high degree of bioavailability and assimilation, give a choleretic, sedative, tonic effect, enrich the body with vitamins, microelements, having a beneficial effect not only on carbohydrate, but also on other types of metabolism, general resistance, which is extremely important for patients with sugar diabetes - a disease with a chronic course.

The antidiabetic effect of plants depends on the presence of insulin-like compounds in them (glycoside myrtillin, alkaloid galegin, cyclic alcohol mnositol, etc.), as well as B vitamins, trace elements, amino acids, etc. The advantage of these substances over insulin is that they are of a non-protein nature are not digested in the digestive tract and may be affected if taken orally.

Back in 1922, S. Gollip suggested that the mechanism of sugar formation in plants and in other organisms that do not have a pancreas should be regulated by a substance that replaces the hormone insulin. Still not knowing the structure of insulin, the author assumed that this substance is a guanidine compound.

When the main groups of the insulin molecule are blocked through lysine and histidine, a guanidine group, that is, arginine, is formed. There is a correlation between the number of guanidine and insulin groups and the decrease in its effect. Substances inherent in animals and plants, such as creatine and arginine, contain a guanidine group. They lower blood sugar in experimental animals. Substances that reduce blood sugar levels obtained from plants, S. Gollip called glycokinins.

The chemistry of glycokinins is still not fully understood. Perhaps these are peptides containing sulfur, and arginine obtained from beans. Glycokinins are soluble in water and alcohol. However, they do not act like insulin in diabetes and are unable to reduce blood glucose. Therefore, plant preparations containing glycokinins can and should be used as additional agents in the complex therapy of diabetes mellitus (Yu. A. Zakharov, V. F. Korsun, 2002).

Some medicinal plants affect the metabolism of carbohydrates in the body more physiologically than synthetic antidiabetic drugs, which reduce only elevated blood glucose levels and do not affect normal glycemia (L.I.Savelyeva, 1979 and others).

When using some plants with insulin-like action, stimulation of the regeneration of beta-cells of the insular apparatus was noted (M. Mahu, 1960, and others).

The role of animal lectins in the recognition of individual tissues by cells, which are associated with the action on them of such biologically active compounds as hormones, is also undoubted. Hormones regulate the body’s metabolism. Together with the nervous system, they seem to conduct metabolic processes in human and animal organisms. The role of lectins in the manifestation of certain biological

effects is due to their interference in the mechanism of hormone binding to tissue receptors. This is especially evident in the influence of many plant lectins on the mechanism of action of such an important hormone as insulin (insulin is a protein hormone of the pancreas of humans and animals, which is involved in the regulation of carbohydrate metabolism in the body). According to Quatrekasses' data obtained in the early 70s, WGA and ConA have the ability to bind to insulin receptors in cells and thereby affect the regulation of glucose metabolism in the animal body. It has also been established that endogenous lectins can alter the functioning of the so-called ion channels in the membrane and thus affect a series of metabolic reactions.

One of the main objectives in the treatment of diabetes is to combat oxidative stress and its derivative carbonyl stress. In this regard, a sufficient and timely prescription of antioxidants is of particular importance in the treatment of diabetes. Currently, new properties of thioctic acid have been discovered. Thus, the drug thioctacid, which is widely used in the treatment of diabetic neuropathy, is a powerful antioxidant.

When using herbal products, it is necessary to adhere to a number of principles (V.G. Pashinsky, 1997).

1. The principle of stages. The use of this principle makes it possible to clearly define the role and place of complex herbal preparations at different stages of the disease. In general, this is presented as follows.

At the initial stages of the disease (prodrome, deployment of clinical signs), herbal remedies may be leading, capable of preventing further development of the disease or mitigating its manifestations. With regard to diabetes mellitus, this means that in the initial phase of the disease, phytopreparations, along with a dietary regimen and physical culture, are able to completely restore disturbed metabolic processes.

At the stage of the height of the disease, first of all, it is necessary to use modern potent drugs, given their advantages in immediate effectiveness. Complex herbal preparations at this stage can serve as means of additional therapy to reduce

toxicity and the risk of complications, increase the effectiveness of the main treatment, and correct impaired body functions. In diabetes mellitus, phytopreparations can contribute at this stage to a decrease in the dosage of the main antidiabetic agents, including insulin.

At the stage of recovery, complex herbal remedies can be used along with synthetic, basic ones, and as the manifestation of the disease subsides, herbal preparations should increasingly displace potent ones, replacing them completely at the end of treatment.

Complex herbal preparations play a leading role at the stage of anti-relapse, rehabilitation treatment. Their advantages here are determined by insignificant toxicity in the overwhelming majority of cases, low risk of complications and, in this regard, the possibility of long-term use. Their role especially increases in chronic diseases (such as diabetes mellitus), where herbal remedies can be used as supportive therapy between courses of the main treatment.

At different stages of the disease, especially chronic, and the role of complex herbal preparations is different. In the initial stages, they can be the means of the main therapy, in the stages with a pronounced picture of the disease, they can be means of additional treatment, in the later stages, they can be means of supportive and symptomatic therapy.

The mildness of the action of most herbal preparations, the absence of toxic manifestations during their use (which is associated with their naturalness, closeness to the human body) suggests their existing significance in the prevention of various diseases, including at enterprises and institutions (risk groups) without interrupting production. All this refers to the pharmacology of a healthy person, and synthetic drugs that are alien in their main characteristics to the human body should not be there. In principle, it is possible that the absence or a sharp deficiency in the diet and medical arsenal of a modern person of many plant components that make up the natural antidiabetic, antimutagenic, anticarcinogenic, antiallergic, antihypertensive, antisclerotic, antistressor, etc. background, is

one of the reasons that caused significant increase in morbidity at the present stage.

2. The principle of consistency and hierarchy is based on the position of the integrity of the organism, its unity with the environment. Almost all body systems are involved in both adaptive and pathological reactions. With this in mind, regulatory and therapeutic effects should be carried out. In particular, as one of the components of therapy, it is necessary to use drugs of a general strengthening type of action (adaptogens of the ginseng group, multivitamin plants). Further, according to the principle of hierarchy, it should be recommended (according to indications):

means of specific treatment;

means of "cleansing", antitoxic therapy (diuretics, choleretic, expectorant, laxatives, metabolic regulators);

herbal remedies of a symptomatic nature according to indications;

medicinal food, that is, vegetables, cereals, fruit and berry plants of the corresponding type of action.

Many plants have a wide spectrum of therapeutic action, that is, they are essentially polyvalent. This allows you to choose and recommend for treatment herbal preparations that are most suitable for this particular patient based on the nature of his disease and the severity of concomitant pathological processes. This is possible for both individual plants and their combinations.

This approach is especially important when carrying out rehabilitation, anti-relapse and prophylactic herbal medicine, when there is a need for a combination of specific and non-specific components. It is in accordance with this principle that herbal medicines useful in the treatment of diabetes mellitus are divided into groups according to the supposed mechanisms of action and to a certain extent according to the hierarchy.

3. Individualization of treatment , taking into account the characteristics of a particular organism, its living

conditions, the nature of the disease, forms the basis of the principle of the adequacy of herbal medicine. The arsenal of herbal remedies with the same type of effect is quite sufficient, although they differ in the spectrum of therapeutic action. When implementing the principle of adequacy, the following options can be used:

selection of herbal preparations taking into account the nature of the disease, the characteristics of its course, the presence of complications and associated pathological processes. A clear knowledge of the therapeutic spectrum of each recommended plant is essential. This selection can be most effectively carried out with the help of a computer, in the memory of which all the properties of plants are stored, and, by entering data on a particular patient, three or four corresponding herbal remedies are selected. This is feasible for large, well-equipped hospitals and clinics;

individual selection of herbal products among a number of the same type. This option is most significant for the outpatient treatment of chronic diseases (not excluding the elements of the first option). Its essence lies in the fact that a patient, having tested on himself several plants from the proposed list in a two-three-week regime, each individually, chooses three or four that are most suitable for him personally, the most effective (at least according to the principle “like it or not,” which is also of no small importance), the use of which is not accompanied by any undesirable or unpleasant consequences. These will be drugs for long-term individual treatment (and prevention) of a particular patient. At the same time, it is desirable to take into account the opinion already repeatedly expressed that the plants of the patient’s place of residence are often more effective than plants from more distant places. In the treatment of diabetes mellitus, the individual selection of the most suitable phytopreparations is very important.

4. The principle of continuity of therapy. A significant part of the diseases of our time are chronic diseases that require prolonged, often many years and often continuous treatment. Mild-acting, non-toxic complex herbal preparations are most suitable for these purposes, including for

maintenance therapy between courses of the main treatment. In this case, the following provision must be taken into account. Although this phenomenon is less typical for herbal preparations, it is still possible to get used to them. Therefore, it becomes necessary in the process of long-term continuous therapy to periodically change preparations from plants, at least after 1–2 months. It is most rational to produce it among those individually selected herbal remedies that turned out to be the most suitable, the most effective: a month - one plant, a month - another, a month - a third, and the whole cycle can be repeated. Given the nature of the pathological processes in diabetes mellitus, the application of this principle is strictly necessary.

5. The time principle is the use of biorhythmological characteristics both in the functioning of the body and in the effectiveness of drugs. Currently, a higher therapeutic efficacy of hormonal drugs (glucorticoid type of action) is known, bronchodilators - in the morning, central nervous system stimulants - in the daytime, narcotic, hypnotics, sedatives, tranquilizers, antibiotics, cardiovascular drugs - in the evening, diuretics - in the afternoon. Known examples and seasonal fluctuations in the effectiveness of plants. In particular, adaptogens (ginseng, leuzea, eleutherococcus, golden root and others) are not recommended to be prescribed in summer, in hot weather (this also has to do with diabetes therapy), glucocorticoids are more effective in spring, and hypnotics - in autumn and winter … With regard to plants recommended for the treatment of diabetes mellitus, it can be noted that phytopreparations of the first group (adaptogens, activators of the central nervous system) should be used in the morning, in the morning and at lunchtime, and herbal remedies with a calming component of action (bearberry, knotweed, St. , wheatgrass, dandelion, peony, clover, blackberry, lingonberry, strawberry, chicory, vegetable salad, honey) - in addition to them in the evening. This complex (in the morning and at lunchtime - tonic, in the evening - soothing), simulating the natural daily biorhythm of human activity, can be called a system of “swinging the biological rhythm”.

6. The principle “from simple to complex”. At the initial signs of the disease, food plants, restorative therapy are usually prescribed. With a more pronounced nature of the pathological process, other medicinal plants are added. With the further spread and aggravation of the disease, they are combined with specific potent agents and methods of treatment. In the late stages of diabetes mellitus, the use of herbal remedies will contribute to the elimination, mitigation of various consequences of the disease, the elimination of individual symptoms, manifestations of a total “failure” of metabolic processes, possibly a decrease in doses of insulin and insulin-containing drugs.

7. The principle of small and medium doses. Studies have shown that complex herbal preparations (in the form of infusions, decoctions, tinctures, extracts) in small and medium doses exhibit a distinct pharmacotherapeutic effect, and when used in large doses, the effect may be reversed. The line between high and medium doses is quite individual. Therefore, the dosages of herbal remedies recommended in the next section should be considered as the maximum therapeutic. It is necessary to start treatment with low doses of 1 / 5-1 / 3 of those described below. If there is a sufficient effect (which can be determined in some cases not earlier than 2-3 weeks of use), then such doses should be taken as a basis. If the therapeutic effect is insufficient, the dose should be increased to the recommended level. If in this case the medicinal effect of the plant is not detected, then it should be replaced with another. If any undesirable effect appears, it is necessary to reduce the dose of the plant by 2–3 times, and if negative phenomena persist, cancel it altogether and prescribe another phytopreparation. With this selection of doses, the total duration of application of one herbal remedy should not exceed 1.5-2 months. When changing drugs, it is necessary to ensure the continuity of therapy.

8. Principles of combining herbal remedies. In ancient medical systems, complex compositions of several (from 4 to 65) plants and other natural sources were most often used. Modern herbalists and herbal medicine lovers also often prefer herbal mixtures recommended in various literary sources.

More rational should be considered the initial individual selection of individual plants, the most active, most suitable for this particular patient. And in the future, move on to mixtures that can be composed (and not only taken ready-made from literature or from traditional medicine), based on a number of considerations. First, it is advisable to combine funds with different types of action in accordance with principle No. 2 (see above). With regard to the treatment of diabetes mellitus, this means that it is most advisable to combine plants from different groups. Moreover, the combination can consist not only in mixing plants in a single dosage form, but also in the use of several plants in different daily regimes, taking into account the circadian biorhythm. As an example, in principle No. 5 (see above), the system of "swinging the biological rhythm" is given. Secondly, the important question is about the doses of plants included in the combination. The following position can be recommended. When composing a mixture of two plant components, each is taken in half the dose, a mixture of three components - 1/3 each, four - 1/4, and so on. Given that the doses of individual plants are different, then the amount of herbs in the mixture will be different, vary depending on the number of components. Other criteria for the composition of plant mixtures based on the prevalence of certain symptoms of the disease are not excluded, hence the prevalence of one or another component. The mixtures of medicinal plants recommended in the literature and finished preparations from them are selected individually in the same way as individual plants (see above).

9. Some precautions when using medicinal plants:

At the first signs of drug intolerance, it is necessary to reduce the dose of the drug, and if this does not help, cancel it and replace it with another, similar in action.

Plant raw materials must be purchased only in pharmacies, in no case - not from private individuals (this is especially true for plants that use the underground part).

You can independently harvest only those types of medicinal plant materials that are well known to the collector

and that differ significantly from others accompanying them in nature (for example, dandelion, motherwort, burnet, etc.).

Do not collect medicinal plants within a city and a settlement with a highly developed industry, near major highways, railways and agricultural land (no closer than 50–100 m from them).

Biologically active substances of medicinal plants

Medicinal plants and phytopreparations obtained from them have long been used for treatment, as well as for the prevention of almost all human diseases, including such widespread and most dangerous ones as cardiovascular disorders, gastrointestinal, nervous, skin and other diseases of various etiologies. and even malignant neoplasms.

Medicinal plants and phytopreparations obtained from them have the essential advantages that when using them, the patient receives a whole complex of related chemical compounds. They affect the body much milder, better tolerated, much less likely to cause side reactions (allergies, dysbiosis, blood diseases, stomach and intestinal ulcers, etc.) and, as a rule, do not accumulate in human tissues.

The complex of substances that make up medicinal plants can give additional and often very useful properties that are absent in individual chemical compounds isolated from the same plants. For example, belladonna galenic preparations containing the entire complex of plant substances have a pronounced therapeutic effect in Parkinson’s disease, while the main alkaloid of this plant (atropine) does not have such properties.

However, emphasizing the advantages of herbal preparations, we do not seek to oppose them to synthetic agents. On the contrary, for therapy, it seems that the most favorable is a rational combination of both. In the acute stage of the disease, when an urgent effect of drugs is needed, it is

advisable to use synthetic drugs or their natural analogues, but then patients should be prescribed herbal medicines that are less toxic, act softer and longer, and in some cases remove the negative effects from the use of synthetic drugs …

A specific feature of plants is their ability to accumulate and synthesize a wide variety of chemical compounds. Medicinal properties are possessed by those of them, which are characterized by biologically active substances (BAS), which have a pharmacological effect to normalize the pathological process and return the patient to normal life.

In addition to biologically active substances, plants always contain the so-called ballast (accompanying) substances that do not have a pronounced pharmacological effect (fiber, pectins, plant fibers, etc.), which is not always justified.

Among biologically active substances, substances are isolated that are synthesized and accumulated by plants. These include alkaloids, terpenoids, phenolic compounds and their glycosides, polysaccharides, saponins, vitamins, fatty oils, phytoncides, resins, amino acids, lignans, phytoecdysones, phytohormones, etc. Some plants are able to concentrate a number of biologically active substances, in particular micro- and macroelements, pectins and organic acids, etc.

The vital activity of the organism is provided by two processes: assimilation (assimilation) and dissimilation (decay), which are based on the exchange of substances between the internal (body cells) and the external environment. For the normal course of metabolic processes, it is necessary to maintain the constancy of the chemical composition and physicochemical properties of the internal environment of the body (homeostasis). It depends on certain factors, among which an important place is occupied by biologically active substances supplied with food (vitamins, enzymes, mineral salts, trace elements, etc.) and carrying out a harmonious relationship and interdependence of processes in the body. By normalizing, regulating all vital functions, biologically active substances also have an effective therapeutic effect.

Without dwelling on all biologically active substances, I would like to consider more broadly some of them, in particular vitamins and minerals.

Vitamins are a group of organic substances of various structures that are vital for a person for the normal metabolism and vital activity of the body. Many of them are part of enzymes or take part in their formation, activate or inhibit the activity of some enzyme systems.

Basically, vitamins are synthesized by plants and enter the body with food, some of them are formed by microbes living in the intestines. An insufficient content of vitamins in food, as well as a violation of their assimilation by the body, lead to the development of severe metabolic disorders. The disease resulting from the absence of one or another vitamin in the body is called vitamin deficiency; with a relative deficiency of any vitamin, hypovitaminosis is observed.

Sometimes hypovitaminosis can also occur with a sufficient supply of vitamins to the blood and human tissues, where they quickly lose their biological activity due to prolonged use of certain drugs (for example, the rapid destruction of vitamin B6 while taking streptomycin in patients with tuberculosis), etc. (Table 2).

table 2

Phytocorrection of hypovitaminosis

Medicinal plants contain a significant amount of minerals that are part of cells and intercellular fluids. Inorganic compounds are indispensable components of all living organisms, which assimilate them with food, water and air. The main share of minerals is received by a person with plant food (Table 3).

Depending on the quantitative content of inorganic substances in the internal environment of the human body, V.I. Vernadsky divided them into macroelements (sodium, potassium, calcium, magnesium, phosphorus, chlorine), microelements (copper, iodine, iron, aluminum, manganese, fluorine, bromine , zinc, strontium, etc.) and ultramicroelements (mercury, gold, silver, chromium, radium, uranium, thorium, silicon, titanium, nickel, etc.).

Table 3

Mineral reduction characteristic

The modern development of sciences: biology, pharmacology, physiology - allows to substantiate and explain the mechanisms of action of phytotherapy in diabetes mellitus (N. V. Ershov, V. F. Korsun, 2013).

Complex treatment of diabetes mellitus in combination with herbal medicine should ensure that such patients receive essential (vital) trace elements: zinc, manganese, chromium.

The high efficiency of herbal medicine for patients with diabetes mellitus is explained by the presence of these trace elements in herbs in the form of chelate compounds. Chelated chemical bonding involves the bonding of two amino acids and a mineral ion. Metal ions, being in the shell of the amino

acid, are easily broken down by the body, not only the metal ion is used, but also the amino acid. Minerals in the form of inorganic salts are absorbed only by 10–20 %.

The micronutrient manganese plays an important role in the development of immunoresistance and diabetes mellitus. Participating mainly in intracellular phosphorylation reactions and taking an active part in the work of insulin receptors in cells, manganese occupies one of the main places in maintaining carbohydrate metabolism at a normal level.

Manganese deficiency is observed in 50 % of patients with diabetes. Manganese ions are essential for maintaining energy metabolism by participating in the breakdown of carbohydrates and fats. Lack of manganese leads to insulin resistance, increased cholesterol levels, and fatty hepatosis.

Studies show that the use of plants, mushrooms, fruits containing manganese improves the blood glucose balance and can significantly reduce the dose of antihyperglycemic drugs, and in some cases, completely cancel them. The use of blueberry leaf in diabetes mellitus can reduce hyperglycemia by 40 %, chaga by 30 %, chestnut oak acorns by 20 %. This efficiency is due to the high content of manganese in their composition.

Based on the foregoing, the long tradition of phytotherapists for treating diabetes mellitus with herbs and plants containing large amounts of chelated manganese compounds is understandable: blueberries (champion in manganese content), linden, raspberries, barberry, oak, birch, sage, knotweed.

Herbal medicine for patients with diabetes mellitus is most effective in the presence of a balanced dietary food containing a significant amount of vegetables and fruits.

According to modern studies, the consumption of fruits by patients with type 2 diabetes mellitus and those predisposed to diabetes mellitus has its own characteristics. American scientists published in August 2013 in the British Medical Journal the results of three prospective long-term studies

“Fruit consumption and the risk of developing type 2 diabetes.”

After making individual adjustments for lifestyle adjustments, the following data were obtained:

a) the consumption of blueberries, grapes, apples and pears significantly reduces the risk of developing type 2 diabetes;

b) strawberries, melon increase the likelihood of developing type 2 diabetes.

Attempts to explain the results of these studies by the ability of different fruits to increase blood sugar in different ways, that is, given their glycemic index, were not justified, since the fruits and berries under study were divided into three groups:

• high glycemic index (60–70) - grapes, raisins;

• average glycemic index (45-59) - blueberries;

• low glycemic index - apples, pears, strawberries.

Discrepancies with the results are visible. High glycemic index grapes and raisins reduce the risk of diabetes. This means that the glycemic index of fruits and berries does not play a major role in the development of diabetes.

Of the fruits and berries considered, two main groups can be distinguished:

1) fruits and berries containing a large amount of manganese;

2) fruits containing a large amount of iron: strawberries, melons - the latter increase the risk of developing diabetes.

An excess of trace elements iron inhibits the absorption and assimilation of manganese in the intestine, creating its deficiency. In case of iron deficiency, on the contrary, the bioavailability of manganese increases. Thus, taking into account modern data on the structure of the insulin receptor, on the mechanisms of action of microelements inside the cells of the body, it is possible to explain the different directions of action of fruits and berries on the risk of developing diabetes

mellitus by their different microelement composition, which can be widely used in phytotherapy of type 2 diabetes mellitus and its prevention.

Microelements are involved in the formation of soft and hard tissues of the body; are a part of enzymes, hormones, vitamins, nucleic acids, proteins, and also regulate their biological activity (Table 4).

Table 4

The content of trace elements in medicinal plants with hypoglycemic activity

* Marked with signs:

- absent;

+ - up to 0.2 mg per 100 g of raw materials;

++ - 0.2–1.0 mg per 100 g of raw materials;

+++ - 1.0–5.0 mg per 100 g of raw materials;

++++ - more than 5.0 mg per 100 g of raw material.

Silicon is a powerful catalyst for redox reactions, plays an important role in protein, fat and carbohydrate metabolism, in the formation of various hormones and enzymes. The lack of silicon contributes to the occurrence of diabetes mellitus, if the content of the trace element is 1.4 % or less. Silicon is also directly involved in the synthesis of collagen by the human body - a protein that provides strength and elasticity of

connective tissue (which is the basis of skin, hair, nails, bones, cartilage, tendons, blood vessels). Silicon water largely normalizes lipid and carbohydrate metabolism, and that is why its regular use in the daily diet is an excellent prevention of severe forms and complications of diabetes mellitus. Silicon deficiency increases with age, which leads to the development of atherosclerosis, heart attacks, strokes, diabetes, cataracts, and polyarthritis.

Magnesium is one of the most important microelements of the body, manifesting itself as a regulator of biochemical processes, a calcium antagonist and a regulator of physiological functions. Magnesium affects the functioning of many organs and systems, including the endocrine, by stimulating the secretion of insulin and increasing the sensitivity of receptors to it. Magnesium deficiency in the body is formed under the influence of external factors (nutritional deficiency, stress, physical inactivity, hypocaloric diets, etc.) and factors associated with various diseases, including the presence of diabetes. Thus, a deficit in the intake of magnesium into the body and its intensive consumption in diabetes leads to a decrease in the synthesis of insulin and the sensitivity of receptors to it, which worsens the compensation of carbohydrate metabolism in patients with type 1 diabetes, especially in adolescents with physiological insulin resistance of cells (G. E. Smirnov et al., 2008).

Amino acids are organic compounds whose molecules contain amino groups (NH2 groups) and carboxyl groups (COOH groups). About two hundred natural amino acids are known, but proteins contain only twenty amino acids, which are called normal, basic or standard. Deficiency of proteins in the body can lead to an imbalance in water balance, which causes swelling. Each protein in the body is unique and exists for a specific purpose. Proteins are not interchangeable. They are synthesized in the body from amino acids, which are formed as a result of the breakdown of proteins found in food. Disorders of amino acid metabolism are often associated with abnormalities of transamination: with a decrease in the activity of enzymes that catalyze transamination reactions, - aminotransferases with hypo- or avitaminosis B6, impaired

synthesis of aminotransferases, lack of keto acids necessary for transamination due to inhibition of the tricarboxylic acid cycle in hypoxia, diabetes mellitus and t. d.

Taurine , an essential sulfoamino acid, is a natural metabolite. With diabetes, the body's need for taurine increases, and, conversely, taking dietary supplements containing taurine and cystine reduces the need for insulin. Taurine is found in eggs, fish, meat, milk, but not in plant proteins. It is synthesized from cysteine in the liver and from methionine in other organs and tissues of the body, provided there is a sufficient amount of vitamin B6. Treatment of diabetes mellitus with natural metabolites has always attracted the attention of doctors. From these positions, they represent the domestic drug dibicor, the active principle of which is taurine. The drug has undergone extensive clinical trials in leading endocrinological clinics in Russia and is recommended for the treatment of patients with diabetes mellitus. The positive effect of dibicor on impaired carbohydrate metabolism in diabetic patients has been proven (it reduces fasting and postprandial sugar levels, reduces insulin resistance, increases glucose uptake by cells, and decreases glycated hemoglobin levels). Most patients note an improvement in general well-being, a decrease in thirst, an increase in efficiency, a decrease in general weakness, a cessation of itching, a decrease in pain in the legs and heart area, a decrease in edema and shortness of breath, an increase in visual acuity, and a significant decrease in body mass index. When taking the drug for more than 6 months, the level of cholesterol, beta-lipoproteins, triglycerides decreases, microcirculation and peripheral blood flow improve.

The hypoglycemic effect of **guanidine derivatives** was known even before the discovery of insulin. However, attempts to use them for the treatment of diabetes mellitus turned out to be ineffective due to the high toxicity of the used drugs of the diguanide series (synthalin A and B). Only since 1957, when phenethylbiguanide was first synthesized, then dimethylbiguanide and butylbiguanide, the introduction of this group of drugs into clinical practice began.

The quantitative composition of amino acids and guanides in antidiabetic plants has not been sufficiently studied, with the exception of common beans and goat's rue. The leaflets of the fruits of these plants contain the amino acids arginine, tyrosine, tryptophan, asparagine and choline, as well as guanidines and biguanidines. Arginine, galegin, trigonelline and meso-inositol have an antidiabetic effect.

Of particular interest, from the point of view of influence on carbohydrate metabolism, are amino acids, which are found in large quantities in plant raw materials. In particular, leucine increases the insulin activity of blood plasma, acts in a friendly manner with insulin, releasing it from its bound state with proteins.

Alkaloids are organic nitrogen-containing compounds, mainly of plant origin. The name "alkaloid" comes from two words: Arabic "alkali" - alkali and the Greek "eidos" - similar. In plants, alkaloids are found in the cell sap in the form of salts of organic acids widespread in the plant world: malic, citric, oxalic. Much less often alkaloids are found in the form of bases dissolved in fatty acids (ergot) or essential oils (fragrant rue).

The number of alkaloids isolated from plants with an established structure is currently about 10 thousand. They have a very high physiological activity and therefore, in large doses, they are poisons, and in small doses, they are potent drugs of various effects: atropine, for example, dilates the pupil and increases intraocular pressure, and lobeline and cytisine have a stimulating effect on the respiratory system. Caffeine and strychnine excite the central nervous system, while morphine inhibits it; papaverine dilates blood vessels and lowers blood pressure, etc. Sanguinarine and chelerythrine - alkaloids of celandine and macleia cordata - are characterized by antimicrobial and antiviral activity and have a fungistatic and bactericidal effect against purulent complications of diabetes. Vinblastine and vincristine - the most valuable alkaloids from catharanthus rosea - are characterized by antitumor activity. Preparations containing alkaloids of celandine and barberry are used in the treatment of diabetes.

Many types of plant raw materials, as a rule, contain not one, but several alkaloids, often of different actions, but quantitatively one of them prevails, which determines the predominant nature of the effectiveness of the use of a medicinal plant and total preparations from it.

Glycosides are natural organic compounds of sugars with non-sugar-containing aglycones. Glycosides are broken down (hydrolyzed) into sugars and the corresponding aglycones in the presence of acids under the action of enzymes, and some even when boiled with water. In their pure form, glycosides are amorphous or crystalline substances soluble in water and alcohols. Depending on the chemical nature of aglycone, glycosides are divided into cardiac glycosides, saponins, anthraglycosides, bitter glycosides (iridoids), cyanogenic glycosides and thioglycosides (glucosinolates).

Cardiac glycosides have a strong and specific effect on the heart muscle, increasing the strength of its contractions. Medicinal plants are the only source of these chemical compounds. In medical practice, a number of drugs containing cardiac glycosides are used, in particular, from foxglove, adonis, lily of the valley, jaundice, etc. However, they all accumulate in the body, and their use requires certain tactics.

Saponins are glycosides of triterpene and steroid structures. They have hemolytic properties, toxicity to cold-blooded animals and the ability to form a stable, long-lasting foam when shaken. Saponins are readily soluble in water and are found in plants of the families of liliaceae, dioscoreae, legumes, buttercups, norichniks, araliaceae, etc. This applies to such well-known plants as aralia, dioscorea, chestnut, leuzea, lemongrass, lime, dandelion, primrose, plantain cyanosis, stalnik, eleutherococcus, horsetail, etc. Even this small list of plants indicates expectorant, hypotensive, adaptogenic, hormone-like, hypocholesterolemic, hypoglycemic properties of saponins, which is widely used in herbal medicine for diabetes.

Anthraglycosides are anthracene derivatives with methyl, oxymethyl, aldehyde and hydroxyl groups in

aglycone. Anthraquinone derivatives are widespread in plants of the buckwheat, buckwheat, legumes, liliaceae family, as well as in molds, mushrooms and lichens. They are carriers of electrons in the body like quinones and are capable of activating photooxidation and photoreduction reactions. Many anthraquinones have a laxative effect (ramnil, kafiol, senna, regulax, persenide, decoctions and infusions of senna leaves, buckthorn bark, rhubarb root, flax flowers, horse sorrel root, etc.).

Oxymethylanthraquinones of madder dye and bedstraw of the present have an antispasmodic and diuretic effect, promote the decomposition of urine calculi containing calcium and magnesium phosphates. Among quinoid compounds, in particular derivatives of chrysophanic acid, substances with litholytic and antitumor activity have been identified.

Phenol glycosides are derivatives of phenol, hydroquinone, fluroglucin and their derivatives (arbutin of bearberry and lingonberry leaves; derivatives of aspidinol, albaspidin and felix acid of male fern rhizomes, etc.). Phenolic acids and phenol alcohols from plants, in particular from rhizomes of Rhodiola rosea, have a tonic, adaptogenic effect, which is very valuable for diabetes.

Thioglycosides are derivatives of cyclic forms of thiosaccharides and are readily cleaved. They are widely found in plants of the cruciferous family (mustard, radish, horseradish, radish, cabbage, etc.). Most of them are irritating to the eyes and skin.

Bitter glycosides (bitters) are derivatives of cyclopentanoid monoterpenes (iridoids). A characteristic sign of the presence of iridoids is a very bitter taste and their blackening when dried. In this case, enzymatic cleavage of iridoids occurs (for example, aucubin, etc.). Among them, you can find plants with hormonal, antispasmodic, choleretic, antibiotic, sedative, antitumor, coronary expansion, wound healing, antimycotic activity, which is important in the presence of diabetic foot syndrome.

For example, bitter glycosides from gentian are not inferior in antifungal activity to such well-known antibiotics as

nystatin and amphotericin B.

Flavonoids - phenolic compounds of plants - are one of the most common groups of biologically active substances. They belong to the derivatives of chromone with different degrees of oxidation of the chromone cycle. Depending on this, flavones, flavanones, flavanolones, chalcones, etc. are distinguished. In a free state, only separate groups of flavonoids (catechins, leukoanthocyanidins) are found.

Flavonoids are involved in the process of respiration and fertilization of plants, have an antioxidant, radioprotective effect, have a positive effect on the function of the cardiovascular and digestive systems, liver, kidneys, urine, hematopoiesis, etc. They have low toxicity and are used in medicine as P- vitamins (rutin, quercetin, tea catechins, etc.), hypoglycemic (stevia extract, medostevin, perstevite, etc.), choleretic (flamin, rosehip extract, holosas, etc.), hypoazotemic (flaronin, lespenephril, lespeflan, etc.) drugs. Especially rich in flavonoids are buckwheat leaves, flower buds of black chokeberry, mountain ash, St. John's wort, sea buckthorn fruits, horse chestnut seeds, nettle leaves, tricolor violet grass, etc., and it is recommended to use them in the complex therapy of diabetes.

G. G. Zapesochnaya, V. A. Kurkin et al. (2002) substantiated the expediency of using preparations based on raw materials of some plants containing flavonoids as hepato- and gastroprotective and antioxidant drugs. It has been shown that phytopreparations based on the fruits of milk thistle, birch buds and leaves, licorice roots, buckwheat grass, poplar buds, acutifoliate willow bark, rhizomes of safflower leuzea, lavender flowers contain the entire set of flavonoids characteristic of the raw materials of the corresponding plants. The expediency of using standard samples of silybin (milk thistle), hyperoside (birch leaves), pinostrobin (buds of poplar, propolis), licurazide (licorice), rutin (buckwheat), isosalipurposide (bark of Norway willow) has been substantiated. It was revealed that the flavonoids of the studied plants combine hepatoprotective and antioxidant properties.

In the mechanism of the detoxifying effect of flavonoid glycosides, an important role is played by such factors as the thickening of vascular-tissue membranes, prevention of lipid oxidation in the liver, activation of adenosine triphosphatase (ATP-ase), accumulation of glycogen in the liver and complexing ability in relation to metal ions (copper, iron, zinc, manganese, etc.).

In recent years, the immunostimulating properties of a number of flavonoids and their positive effect on the function of the pancreas in the treatment of diabetes have been discovered. Plants containing flavonoids are most widely used in the form of freshly prepared infusions and decoctions in a pharmacy and at home with a doctor's prescription.

Ecdysteroids. One of the most significant scientific achievements of recent times is the development of technologies for using ecdysteroids synthesized by plants in the management of the growth and development of various organisms. The latest discovery, adding new content to the well-known adaptogenic and immunomodulatory effects of ecdysteroid-containing drugs in classical, folk and alternative medicine, further raises its significance and relevance for the health of a person suffering from diabetes. As ligands for intracellular and membrane receptors, their control elements, ecdysteroids have the ability to alter the homeostasis of the body, affecting the growth, differentiation and programmed death of cells (Kucharova and Farkas, 2002), and the production of specific products of their metabolism. The role of ecdysteroids as ligands is to switch between two states of the gene transcription mechanism according to the on-off principle and / or in transmembrane signaling to intracellular targets through a cascade of secondary messengers. In practical medicine, ecdysteroid-containing compounds are used to prevent diseases and maintain the immune status in a healthy person, occupy an important place in sports, space and military medicine, are used in the treatment of diabetic feet, and transplantation of human organs and skin (N.P. Timofeev, 2005). These substances perform some universal hormone-like role, but they are not. They rather regulate the balance of hormones and rank higher in the hierarchy of biologically

active substances than the latter. The presence of ecdysteroids was found not only in higher flowering plants, but also gymnosperms, ferns, fungi, algae and mosses, as well as insects, crustaceans and nematodes. *Rhaponticum carthamoides* (Willd.) *Are* among the most important ecdysteroid-containing plants, which are super-concentrating species and which serve as industrial sources for obtaining ecdysteroids .

Essential oils are volatile aromatic liquids of complex chemical composition, the main components of which are terpenoids. Essential oils are greasy to the touch, but, unlike fats, they do not leave greasy stains on paper or fabric, as they completely evaporate, like ether. Essential oils are poorly soluble in water, well - in fats, ethyl alcohol, chloroform and other organic solvents.

Due to the complexity of their chemical composition, their classification is difficult. Conventionally, essential oils and essential oil raw materials are divided mainly according to the main groups of terpenes: acyclic monoterpenes, monocyclic, bicyclic, sesquiterpenes, including complex sesquiterpene lactones, as well as aromatic compounds and rubber. The number of components in one essential oil can reach more than a hundred.

In medicine, essential oils are used, obtained from plants of the family of labiates, cloves, asteraceae, umbrella, and also coniferous (gymnosperms) plants. Most of them have expectorant, antiseptic, bactericidal, anti-inflammatory, antispasmodic, diuretic, carminative, sedative and choleretic properties. When absorbed into the blood, essential oils in small doses stimulate the respiratory and vascular centers. Some essential oils containing phenolic compounds (thyme, birch, pine oil, etc.) have analgesic, sedative, antiseptic and antiviral properties, which makes it possible to use them in the complex treatment and prevention of bronchitis, influenza, ARVI, etc., which are often found in patients with diabetes.

Mint, sage, cinnamon oils have pronounced bactericidal properties and are recommended for diseases of the digestive tract. They are also used to improve the taste of medicinal

substances, in perfumery and the food industry (oil of mint, pine, rose, wormwood, coriander, lavender, etc.). Essential oils containing phenylpropanoids (oil of parsley, dill, fennel, anise, celery) stimulate lactation in women, increase juice secretion during digestion. Aromatherapy is developing rapidly on the basis of numerous data on essential oils.

Fatty oils of plants are esters of the trihydric alcohol of glycerol and high molecular weight fatty acids. When boiled with alkalis or under the influence of enzymes (lipases), they are broken down into glycerin and fatty acids. The latter with alkalis form salts called soaps. Limit - oil, nylon, octane, decyl, lauric, myristic, palmitic and stearic; unsaturated - palmitinoleic, oleic, linoleic, arachidonic, etc.

Unsaturated acids of fatty oils, especially linoleic, linolenic (as well as arachidonic, typical mainly for animal fats), are irreplaceable nutrients in metabolic processes, especially cholesterol, prostaglandins. For example, they accelerate its excretion from the body in chronic hepatitis, increase the effectiveness of the lipotropic action of choline, and are the material from which prostaglandins are formed in the body.

In medical practice, fatty oils are used in ointments as an emollient for the skin. They serve as solvents for camphor and hormonal preparations, and are also used to obtain oil extracts from plant materials (henbane, St. John’s wort, etc.). Some oils have strong physiological effects on the body. These include, for example, castor oil, whose laxative effect and unpleasant taste are known to many. Croton oil also has the strongest laxative effect. In medicine, sea buckthorn oil is widely used as an epithelial and analgesic agent for burns, bedsores, skin lesions of an ulcerative and dystrophic nature (diabetic foot).

Tannins (tannins) are high molecular weight polyphenols, which got their name due to the ability to cause tanning of animal skins due to the chemical interaction of phenolic groups of plant polymer with collagen molecules. In the air, these substances oxidize, forming flobaphenes - products that are colored brown and do not have tanning properties.

Tannins isolated from plants are amorphous or crystalline substances that are soluble in water and alcohol. With heavy metal salts, they form a precipitate; precipitate mucus, proteins, alkaloids, resulting in water-insoluble albuminates, which is the basis for the antitoxic effect of tannides, which is often used in emergency medical care.

According to their chemical structure, tannins are divided into hydrolyzable and condensed tannins. Condensed tannins are formed during the polymerization of catechins, leukoanthocyanidins and other reduced forms of flavonoids both in plants and during processing. The source of natural condensed tannides is oak, chestnut wood, coniferous tree bark, blueberry fruits, cinquefoil rhizomes, bird cherry fruits, etc.

Tannins have distinct anti-inflammatory, tanning properties and are applied externally and internally. Their anti-inflammatory effect is based on the formation of a protective film of protein and polyphenol.

In the case of an infectious process in the intestine, the use of tannins is undesirable, since they do not destroy microorganisms, but only partially bind them, temporarily inactivate them, which may be the reason for the insufficient effectiveness of the subsequent use of antibiotics and sulfa drugs and cause the development of chronic intestinal infection.

Some tannins, in particular those contained in badan, celandine, plantain, walnuts, have an anti-inflammatory, reparative, wound healing effect, which is useful for patients suffering from dermolipodystrophies in the prevention and treatment of diabetic foot.

Coumarins are natural compounds, the chemical structure of which is based on coumarin or isocoumarin. This group also includes furocoumarins and pyranocoumarins. Coumarin is a hydroxycinnamic acid derivative. It is widely distributed in the plant kingdom. The smell of hay is due to the presence of coumarin in it. Coumarins are characteristic mainly for plants of the families of the umbrella, rue and legumes.

Depending on the chemical structure, coumarins have different physiological activity: some show an antispasmodic effect, others have a capillary-strengthening effect. There are coumarins curariform, calming, antimicrobial and other effects. Some of them stimulate the functions of the central nervous system, lower the level of cholesterol in the blood, prevent the formation of blood clots in the blood vessels, facilitating their dissolution (sweet clover). Furocoumarins are most widely used in medical practice. Xanthoxin, bergapten, psoralen, angelicin, contained in the fruits of parsnips, dental ammonia, psoralei, fig (fig tree) and ficus leaves, have a photosensitizing effect, that is, they increase the sensitivity of human skin to ultraviolet rays, which makes it possible to use them in the treatment of diabetic foot, dermolipodystrophy. Complex drugs Kellin, Avisan, Pastinacin have an antispasmodic, vasodilating and sedative effect on the body in secondary biliary dyskinesia, duodenitis, etc. in patients with diabetes.

Polysaccharides are natural polymers of monosaccharides linked by glycosidic bonds into linear or branched chains. There are homo- and heteropolysaccharides. An example of a homopolysaccharide is inulin from Jerusalem artichoke; to geterosaharidam include pectin, gums and mucus. It is especially important to use polysaccharides from cordyceps, reishi mushrooms, etc. in diabetes mellitus. The cell wall polysaccharide of the Reishi mushroom beta-D-glucan, called ganoderan, as well as chitins affect all forms of immunocytes: phagocytes, with the activation of their absorption activity and metabolism. They help to normalize the functional activity of T-lymphocytes, stabilize the level of normal antibodies in the blood and reduce the level of circulating immune complexes in diabetes.

Pectins are carbohydrate polymers composed of uronic acid residues and monosaccharides. Pectin substances (from the *Greek* pektos - coagulated, frozen), which are based on pectic acid, which is polygalacturonic acid. Pectin contains small amounts of residues of neutral monosaccharides L-arabinose, D-galactose, D-xylose and fructose, which are attached to pectin substances in the form of side chains (N. A.

Tyukavkina, Yu. N. Baukov, 1993). The glycosidic nature provides high stability in alkaline and hydrolysis in acidic media. Complete hydrolysis leads to the formation of monosaccharides or their derivatives, incomplete hydrolysis leads to a number of intermediate oligosaccharides. Once in the acidic environment of the wound discharge, pectic acid, undergoing hydrolysis, forms the monosaccharide D-galacturonic acid, which exists in cyclic and aldehyde forms.

A characteristic property of pectins is their ability to form jellies in the presence of sugar and acids, with many metals (calcium, strontium, lead, etc.), to form insoluble complex chemical compounds, which are practically not digested in the digestive tract and are excreted from the body. This ability of pectins explains their radioprotective, antitoxic, complex-forming effect in fatty liver disease, drug hepatitis, diabetes mellitus to reduce the manifestations of oxidative stress (Yu. A. Zakharov, V. F. Korsun, 2004). Pectins, inulin (a soluble form of plant fibers) reduce the digestibility of carbohydrates (starch) and fats from the gastrointestinal tract, remove cholesterol, promote the multiplication of bifidoflora in the large intestine, preventing the growth of putrefactive bacteria. They prevent obesity, normalize intestinal motility, and regulate stool.

In their pure form, pectins are amorphous powders with a shade from white to yellow, brown or gray, almost odorless, hardly soluble in cold water, forming colloidal solutions when heated. Pectins as dosage forms stimulate wound healing, reduce blood cholesterol, and reduce antibiotic toxicity. The fruits of cranberries, black currants, apples, hawthorns, chokeberries (chokeberry), barberries, plums, gooseberries, etc. are rich in pectins.

Gums are complex complexes of neutral and acidic heteropolysaccharides, partially or completely soluble in water to form viscous and sticky colloidal solutions. Due to their high emulsifying and enveloping properties, gums have been widely used in the treatment of patients with diabetes mellitus (M.U. Sharofova, 2008). Gums are found in the cracks of cherry, cherry, apricot trees and some plants.

Mucus is also a complex polysaccharide. They, unlike gums, are readily soluble in water: flax, marshmallow, plantain, lyubka, etc.

Lectins are complex proteins, metal-containing glycoproteins. Non-protein components of lectins: carbohydrates, calcium ions, manganese, less often zinc, magnesium and other metals.

Lectins are naturally occurring compounds found in all living organisms, and their interaction with cellular receptors is a natural reaction. They have the property of reversibly and selectively binding carbohydrates without causing their chemical transformation, provide the transport and accumulation of carbohydrates, determine the specificity of intermolecular interactions (processes of recognition of macromolecules and cells), intercellular interactions. Lectins mimic the action of insulin, reducing the activity of adenylate cyclase in lymphocytes; stimulate tissue immunity, increasing the phagocytic activity of leukocytes; differentially affect T- and B-lymphocytes. When stimulated by lectins, metabolic changes in lymphocytes occur immediately, and a long-term effect is manifested in a day or more after contact with lectin. Long-term reactions include increased protein synthesis, RNA synthesis, DNA synthesis, and lymphocyte division. They are inducers of the formation of interferon by lymphocytes.

Lectins of microorganisms colonizing the small intestine of humans and animals determine the form of symbiotic coexistence of macro- and microorganisms. Having lost these microorganisms, we lose “friends” and open access to harmful, pathogenic microorganisms. This is the area of studying the ecology of the gastrointestinal tract of the human body, which is very important for the development of approaches to a long, healthy human life.

Recently, the presence of a fairly high content of lectins in the herb of nettle, lemon balm, grate, black elderberry and other medicinal plants has been established. On their basis, the staff of the Academy of Sciences of Ukraine (E. L. Golynskaya et al., 1989) developed and approved the collection of lectin-containing plants “FitoGoR” - the only one

of its kind. It received the status of a food biologically active additive in the territories of Ukraine and Belarus. Using “FitoGoR” in the form of herbal tea (you can not only sweeten it!) Or tableted chitosan-lectin complex “HitoKor”, you can, to a certain extent, prevent the epidemic of influenza, acute respiratory diseases, increase the effectiveness of treatment of patients with diabetes (Table 5).

Table 5

The content of trace elements in medicinal plants with antiviral activity

* Marked with signs:

- absent;

+ - up to 0.2 mg per 100 g of raw materials;

++ - 0.2–1.0 mg per 100 g of raw materials;

+++ - 1.0–5.0 mg per 100 g of raw materials;

++++ - more than 5.0 mg per 100 g of raw material.

Phytoncides are organic substances of various chemical composition with a pronounced antimicrobial effect. They are one of the best natural regulators of biological pollution of the biosphere, counteracting the reproduction of pathogens and pests. Phytoncides can have a versatile effect on the human and animal organism, since they have a diverse chemical structure and high biological activity. Phytoncides participate in the ionization of the atmosphere, in the detoxification of

industrial gases, contribute to the deposition of dust, can inhibit or stimulate the growth and reproduction of plants, phyto- and zoopathogenic bacteria, protozoa and pests of agricultural and forest crops.

When creating an artificial phytocenosis in a closed room using equipment, the specificity of the action of some phytoncides on humans has been established: phytoncides of oak have a hypotensive effect; lavender, oregano, lemon balm - sedative; mint - antispasmodic; birch, thyme, linden - bronchodilator; lilac, poplar, bison - pressor action.

The most studied part of volatile biologically active substances is essential oils, which make up a significant part of the volatile substances secreted by plants.

To optimize the human environment, his work and leisure, purposeful greening of cities, towns, villages, sanatoriums and rest homes is essential. The effectiveness of the treatment process in treatment-and-prophylactic and sanatorium-resort institutions is closely related to the use of phytodesign elements. In addition to the aesthetic purpose, phytodesign has a physiological effect on humans, regulates the air microflora, removes and neutralizes pollution, and has the function of phytoindication of dangerous situations.

Phytoncides of garlic (preparations of alisat, allikor, eufitol), onions, eucalyptus (chlorophyllipt, eucalymin) and other plants are widely used as medicines.

Triterpenoids. If birch leaves are mixed with the roots of licorice, Scutellaria baikal, grass of a series, blackheads, then the desensitizing properties of the collection increase, which is associated with the presence of triterpene steroid compounds. Triterpene compounds of birch bark served as the basis for the development by the firm “Birch World” and the effective use of diabetuline in the treatment of diabetes, which was clinically tested at the Endocrinology Center of the Russian Academy of Medical Sciences (Kh. Kh. Sharafetdinov et al., 2006).

Dietary fiber belongs to the so-called accompanying, ballast substances and does not have pronounced medicinal

properties. However, their presence should be taken into account when drying and storing medicinal raw materials, in the manufacture of teas, infusions and preparations, as well as during their use. They are skeletal substances making up the integumentary tissues. By chemical composition, dietary fibers are divided into: cellulose, hemicelluloses, lignins, pectins, etc. The end product of the breakdown of cellulose, in particular under the influence of the enzyme cellulase, is glucose. Dietary fibers are used by the intestinal microflora, promote intestinal motility, adsorb cholesterol, increase glucose tolerance, reduce hyperinsulinemia due to more uniform absorption of carbohydrates, and affect the secretion of intestinal hormones.

As a source of dietary fiber, not only ordinary vegetables, fruits, bran, but also aromatic crushed herbs are used: lemon balm, peppermint, oregano, basil, tarragon.

According to some reports, diseases of civilization, such as atherosclerosis, obesity, cholelithiasis, hepatosis, cirrhosis of the liver, diabetes mellitus, varicose veins, diabetic foot syndrome, are associated with insufficient dietary fiber in the daily diet.

The daily intake of dietary fiber is 50-60 g, including 50 % from grain products, but in practice, no more than 25 g is consumed .

The presence of dietary fiber is one of the most important differences between natural medicines and synthetic medicines.

Narcotic, hypnotic, neuroleptic and tranquilizing drugs, reducing the functional activity of the central nervous system at various levels, modify the activity of internal organs and the relationship of the body with the environment. Under their influence, the functions of many centers of the brain (heat-regulating, vasomotor, respiratory, regulating muscle tone, etc.), the sympathetic nervous system decrease, movements, the work of internal organs, secretory, osmotic, chemical and other processes in the body slow down. As a result, the body’s need for oxygen and energy resources is significantly reduced.

Carotenoids are plant pigments, and until recently it was believed that their main function for birds and mammals is provitamin activity. One of them, beta-carotene, is converted into retinal in the intestinal mucosa, and then into other forms of vitamin A and, thus, indirectly participates in the processes of cell proliferation and differentiation, acts of vision and reproduction. At the same time, data are accumulating on a number of carotenoids that do not have provitaminic activity, but exhibit anticancer and immunomodulatory properties (Table 6).

Table 6

The content of trace elements in medicinal plants with immunostimulating (immunomodulatory) action

* Marked with signs:

- absent;

+ - up to 0.2 mg per 100 g of raw materials;

++ - 0.2–1.0 mg per 100 g of raw materials;

+++ - 1.0–5.0 mg per 100 g of raw materials;

++++ - more than 5.0 mg per 100 g of raw material.

It has been established that vitamin A hypovitaminosis sharply, several times increases the sensitivity of epithelial cells to the action of carcinogens.

Various properties of carotenoids, including antimutagenic, anticancer, radioprotective, are most often explained by their antioxidant activity, that is, the ability to bind reactive oxygen species formed during lipid peroxidation and other organic compounds. Beta-carotenes are already used as an antioxidant in drugs for the treatment of diabetes mellitus, hereditary photodermatosis, porphyria, in the pathogenesis of which atomic oxygen plays a key role.

Currently, the possibility of using carotenoids for the primary prevention of malignant neoplasms, as well as for the treatment of precancerous diseases such as hepatoma and others, is widely discussed and investigated. It has recently been found that preneoplastic growths of the oral mucosa in smokers can be eliminated by local and general exposure to beta-carotene.

Carotenoids are readily soluble in fats, but practically insoluble in alcohol and water. They are provitamins A. Carotenoids are dark red or orange pigments. There are especially many carotenoids in the chromoplasts of carrots, mountain ash, etc.

Organic acids are part of the cell sap of most plant cells. Accumulating in significant quantities in leaves, stems and especially in fruits, they give these parts of the plant a sour taste. Organic acids play an important role in the metabolism of plants, are mainly products of the conversion of sugars, take part in the biosynthesis of alkaloids, glycosides, amino acids and other biologically active compounds, serve as a link between the individual stages of metabolism of fats, proteins and carbohydrates.

According to modern data, succinic, malic, ketoglutaric dicarboxylic acids belong to the group of energy-supplying compounds. The additional introduction of succinic acid into the diet, apparently, activates the economical formation of ATP, which is important during significant physical exertion.

Citric acid is often used as a remedy. It specifically quenches thirst, so patients who are in a fever are given a drink made from lemons or cranberry extract. Sodium citrate is essential for the preservation of blood for transfusion. It is

believed that the biostimulating effect of apple cider vinegar is due to the action of organic acids.

Most carboxylic acids (cinnamic and others) have the properties of biogenic stimulants. Especially many of them are accumulated by plants of the jumbo family (ochins, Kalanchoe, etc.).

Thioctic acid (vitamin N, lipoic acid) is widespread in nature, synthesized in plants, animals, and humans. It belongs to vitamins and participates in the redox processes of the tricarboxylic acid cycle as a coenzyme. It plays an important role in the utilization of carbohydrates and normal energy metabolism. In diabetes mellitus, lipoic acid, acting as an antioxidant, protects the islet cells of the pancreas of rats in the experiment from damage by free radicals. The experiment has shown that alpha-lipoic acid, like insulin, stimulates the process of glucose utilization in muscle cells, eliminating oxidative stress - one of the main pathogenetic mechanisms of diabetic neuropathy.

Organic acids, especially malic and citric acids, are found in many fruits and vegetables. Malic acid is especially abundant in fruits of barberry, mountain ash, apples; lemon - in citrus fruits, cranberries; lactic acid in significant concentrations accumulates in products that undergo lactic acid fermentation (sauerkraut, pickles, kvass, etc.). Malonic acid, which has anabolic properties, is found in the fruits and leaves of asparagus, mountain ash, blueberries.

Providing a therapeutic effect, biologically active substances (BAS) of plants normalize and regulate all vital functions. Knowing the biochemical changes in the body in certain diseases and the elemental composition of medicinal plants and preparations from them, we can artificially introduce some BAS and, conversely, limit the intake of other BAS, thereby correcting the metabolism disturbed due to the disease. BAS, being the result of the synthesis of a living organism, are included in the metabolic processes of the human body more naturally than synthetic drugs.

In plants, biologically active substances are found in an organically bound (chelated), that is, the most accessible and

assimilable form, as well as in a set characteristic of living nature as a whole.

It is possible to speak about specifically acting biologically active substances in relation to phytotherapy only with a certain degree of relativity, since we are dealing with natural complexes of substances with a wide spectrum of pharmacological activity. In this case, with respect to some diseases, a certain substance or a complex of substances can be considered as an accompanying or ballast component, and in relation to others - a pharmacologically active agent.

In conclusion, it should be noted that the treatment with medicinal plants belongs to the varieties of metabolic (additive) therapy and meets the requirements of pathogenetic therapy, since the means of additive therapy have a direct effect on the processes of tissue metabolism, being one of the methods of anti-relapse treatment. Regardless of the chemical or biological nature, the means taken from scientific or folk (traditional) medicine should only bring benefits, not harm.

Dosage forms from plant raw materials

In modern diabetology, teas of medicinal plants are often used for therapeutic and prophylactic purposes. Most of them are approved by the Ministry of Health (MoH) of the Russian Federation. Fees (mixtures, phytocompositions) are prepared from crushed plant materials and used in domestic and industrial conditions in the form of infusion and decoction. Herbal raw materials must have a registration certificate (if it is a biologically active food additive), a certificate of conformity, an annotation; a production pharmacopoeial monograph (PFC) for the collection of herbs, approved by the Pharmacopoeial Committee of the Ministry of Health of the Russian Federation and entered into the State Register. The following inscription is indicated on the packaging of such a collection: “Reg. No. 71/609/23 “(for juniper fruits).

The contained biologically active substances lose their effectiveness over time, based on this, certain storage periods are set for the collection and individual herbs. Usually, herbs, flowers and leaves are stored for 1–2 years, the rest of plant materials (roots, rhizomes, tubers, bark, etc.) are not more than 3–5 years. The fees are stored in a cool dry place in paper bags or cardboard (plywood) boxes. Plants containing essential oils (lemon balm, oregano, thyme, etc.) are stored in glass jars. Poisonous plants are kept under lock and key separately from other herbal collections.

An infusion of individual medicinal plants or collections is prepared as follows: 5 g (1-2 teaspoons) or the estimated amount of crushed medicinal raw materials (for potent raw materials, its dosage is indicated) is placed in an enamel bowl, 200 ml (1 glass) of hot boiled water is poured, closed with a lid and heated in a boiling water bath for 15 minutes, cooled for 45 minutes at room temperature, the remaining raw material is wrung out. The volume of the resulting infusion is brought with boiled water to the original amount.

A decoction from individual medicinal plants or collections is prepared as follows: 5 g (1-2 teaspoons) or the calculated amount is placed in an enamel bowl, 200 ml (1 glass) of hot boiled water is poured, covered with a lid and heated in a boiling water bath for 30 minutes, cooled at room temperature for 10 minutes, filtered, the remaining raw material is wrung out. The volume of the resulting broth is brought to the original amount with boiled water.

Purified (using filters of various designs), magnetized, silicon, distilled, structured (using “Aquadisk”) or boiled water is used as an extractant (extractor) to obtain infusions and decoctions. Sometimes they use a thermos (at home), a microwave oven, AI-Z, AI-3000, SI-1 devices, a microwave complex, etc. Each of them has its own advantages and disadvantages.

The course of treatment with herbal preparations for most chronic diseases is 25–35 days, but with diabetes mellitus, treatment can last for years. Repeated courses are

prescribed after a ten to twelve day break, but no more than two courses after the main course of treatment. Single doses, the number of daily meals, the time of taking teas and meals are changed by the doctor depending on the course of the disease, the individual characteristics of the patient, his age and gender.

The shelf life of the infusion or broth is no more than 2 days when stored in the refrigerator.

It is important when carrying out herbal medicine to choose the right dose of the prepared medicine so that it is tolerable for a child of different ages. Children under 2 years old are prescribed 1/6 of the adult dose, from 3 to 4 years old - 1/5; from 4 to 7 years old - 1/3; from 7 to 12 years old - 1/2.

The dose of tincture for children is 1-2 drops per year of life per appointment.

Tea balsam is a mixture of medicinal plants with tea leaves. In this case, various combinations of medicinal plant materials can be used, and it is desirable to use the tea leaf in a combination of different parts of the black long leaf and green leaf. A part of the collection (tea) can be equal to a teaspoon, a tablespoon, a glass, etc.

Extracts are concentrated extracts from medicinal plants, which is achieved, as a rule, by partial or complete removal of the solvent (water, alcohol) by heating or evaporation. Depending on the solvent used, the extracts can be aqueous, alcoholic, ethereal or their mixtures, and by consistency - liquid (in the form of a dark-colored mobile liquid), thick (the consistency of fresh honey), thick (not poured out of the vessel, but stretched into threads, stripes) and dry (porous, powdery mass with a moisture content of not more than 5 %). Liquid extracts are dosed in the same way as tinctures, in drops, and thick and dry extracts are dosed in units of mass (State Pharmacopoeia, XI edition). When obtaining an extract, the extraction of biologically active substances occurs using a solvent in a ratio of 1: 5 or 1: 1.

Some extracts of industrial production from aloe, hawthorn, viburnum, madder, buckthorn, rhodiola,

passionflower, eleutherococcus, etc. are intended for leave from pharmacies. The most preferable among them are phyto-bases “Herbamarin”, “Vistant”, “Korfit”.

Phyto-base “Korfit” is a mixture of fruit and berry (apple, mountain ash or black chokeberry) extracts, blueberry juice and aqueous-alcoholic extracts of fresh and dry fruits of rose hips and hawthorns, aralia roots and eleutherococcus, used to prepare a soft drink at home or in the catering network.

Phyto-base is a viscous dark brown liquid of sweet and sour taste with an astringent rosehip flavor. It meets the technical specifications TU 10.04.06.13-2002; SGR RU No. 77.99.11.003.E.002335.10.10. Packaged in cans and bottles, shelf life is up to 12 months when stored in dry and clean warehouses at temperatures from 0 to 20 ° C.

Indications for use : hypovitaminosis of primary and secondary nature, stress, neurasthenia of various origins (psychological, physiological, etc.), periods of off-season adaptation, various diseases of the liver, kidneys, endocrine system, blood, conditions after severe operations, injuries.

Method of application : the concentrated base is preliminarily diluted with warm boiled water in a ratio of 1:10 before use. Take before meals 100-150 ml 3 times a day for 3-4 weeks.

All the components that make up the phyto-base are approved by the Ministry of Health of the Russian Federation for use in the food industry.

Syrups are liquid medicinal and dietary forms that are prepared by mixing sweet syrup with a certain amount of tincture or plant extract and other ingredients that make up the syrup. In pharmacies there are rosehip syrup, fortified rosehip syrup, aloe syrup with iron, marshmallow syrup, licorice syrup, etc.

Juices are liquid dosage forms obtained from the processing of finely ground plant materials (fruits, vegetables, roots and tubers). After grinding in a meat grinder (juicer), they are squeezed out manually through a piece of dense cloth or with a hydraulic press. The residue is mixed with a little

water and the extraction of the juice is repeated. The resulting juice contains all water-soluble plant components. Juices are used fresh, canned or sterilized. In order to stabilize the plant sap, it is treated with alcohol in a ratio of 1: 5 or 1: 3, which precipitates mucous, proteinaceous and pectin substances, or inactivates the latter by rapid heating to 78 ° C. Then the juices are immediately cooled, settled and filtered. To prepare condensed juices from fresh plant material, vacuum evaporators are used or they are passed through polyamide membrane filters. In pharmacies there are juices of aloe, Kalanchoe, plantain, etc.

Balm is a liquid form of natural (vegetable) or synthetic origin, which is a complex mixture of active substances, various solvents - extractants (oils, ethers, alcohols). Consistency - from liquid to thick, resembling a gel or liniment. Application - externally and internally, with spoons or a beaker. Numerous modern balms are usually alcohol-containing compositions from plant materials. An example is Bittner's balm, "Amrita", "Pervoprestolny", "Kedrovit", "Altai", "Demidovsky", etc. Balms and elixirs are complex, compositional liquid forms that have minor differences, close to the definition of "liquid", but always having their own characteristic features.

Elixirs (from the Arabic word "al-ixir" - the essence of wisdom, the philosopher's stone) is a liquid alcohol-containing mixture of plant extracts, mainly of general tonic action, applied internally with spoons or drops. It should be remembered that in many cases there is no fundamental difference in the names of the form of a drug: an elixir or a balm.

Medicinal plants used in the treatment of patients with diabetes mellitus

Avocado

Persea gratissima Gaertn

Evergreen tropical tree of the laurel family. Avocado fruits are used abroad for the treatment of patients with diabetes mellitus. Moreover, this effect is possessed not only by the fruit, but also by the mold parasitizing on avocado fruits. Currently, an antidiabetic drug has been obtained from mold.

Sowing artichoke
Cynara

A perennial thermophilic herbaceous vegetable from the Asteraceae family. The artichoke has large inflorescences (heads or baskets) of a rounded, oval shape with a varied color of scales (depending on the variety) - green, light green, bluish green, purple, dark purple, sometimes with reddish specks. Artichoke inflorescences contain tannins, aromatic compounds, flavonoid glycosides - cinaroside, cynarin, luteolin, caffeic acid, a sufficient amount of inulin, ascorbic acid, carotene, B vitamins. The whole complex of substances contained in it is responsible for the effectiveness of the therapeutic effect of the artichoke.

Therapeutic action. Shoots, baskets and artichoke roots are used for medicinal purposes. Decoctions and extracts are prepared from dried artichoke inflorescences containing cynarin. Artichoke extract is recommended for diabetes mellitus as a means of normalizing metabolic processes in the liver, restoring liver functions impaired by diabetes mellitus, improving carbohydrate metabolism, stabilizing fat and protein metabolism. Artichoke extract enhances the detoxification function of the liver, improving the elimination of toxins from the body, increases the synthesis of bile acids, lowering the level of cholesterol in the blood, prevents the deposition of fat in liver cells, promotes the elimination of uric

acid from the body, preventing metabolic disorders in the connective tissue. The artichoke has a normalizing effect on the gastrointestinal tract, stimulating the process of digestion and elimination of unnecessary substances, promotes weight loss, normalizes stool, stimulates the immune system, increasing the body's resistance to infection.

The bioflavonoid cynarin, which is part of the artichoke extract, is a powerful antioxidant. It binds free radicals, which, by participating in lipid oxidation, disrupt the vital functions of cells as a result of damage to cell membranes, primarily in the liver and heart. By suppressing the formation of cholesterol in the liver and removing its excess with bile, the artichoke has a positive effect on the level of cholesterol in the blood due to the presence of the substance luteolin. Therefore, artichoke preparations are recommended for the prevention and treatment of atherosclerosis of the vessels of the heart and brain. Artichoke reduces damage to the membranes of liver cells, binds toxic metabolic products that destroy the liver in cirrhosis and chronic hepatitis, providing a hepatoprotective effect. Artichoke inflorescences also have a mild choleretic, antispasmodic, carminative, appetite stimulating and digestive juices. Therefore, the artichoke is recommended for hypertensive form of biliary dyskinesia, chronic cholecystitis. In patients with impaired renal function, the artichoke has a diuretic effect, an increase in the concentration function of the kidneys, and an improvement in the general condition. The introduction of artichoke into the diet is recommended for diabetes mellitus as an inulin-containing antihyperglycemic agent, reduced gastric acidity.

Nutritional value. The artichoke is consumed raw, boiled, fried and canned. The boiled artichoke is stuffed with vegetable, mushroom minced meat, meat with rice, then poured with sauce and stewed until tender. You can also stew and fry artichokes in breadcrumbs. The artichoke is known primarily as a delicacy from the Mediterranean countries, the demand for which has been steadily growing lately. Artichoke baskets (fleshy receptacle and the lower ends of the scales sitting on it), collected before flowering, when the scales are just beginning to open, are eaten. Artichoke baskets are

fragrant, have a slightly bitter taste, slightly reminiscent of the taste of a walnut.

Artichoke extract is contraindicated in acute gastric and duodenal ulcers, acute pancreatitis, acute calculous cholecystitis with a valve stone at the mouth of the gallbladder duct.

Application form

• Field artichoke leaf extract (Germany) is taken 1 tablespoon 3 times a day after meals for 1 month.

• Hofitol (France) inside in tablets and in the form of injections for kidney diseases.

Astragalus membranous

Astragalus membranacens Bunge

Perennial herb of the legume family. LD Shulyat'eva (1964) found a significant decrease in the level of glucose in the urine in experimental animals after the introduction of drugs of this plant.

Common barberry

Berberis vulgaris L

A shrub of the barberry family, from the barberry family, reaching a height of 1.5–2 m. The branches of the bush are planted with three-divided stipules - thorns. The leaves are obovate. Fresh young leaves of barberry have a sour taste. Inflorescences - drooping racemes, yellow flowers, blooms in May - June; fruits - bright red oblong juicy berries with 2-3

seeds, weighing 0.4 g, ripen in September - October. Grows in almost all European countries. In the European part of the former USSR, it is distributed from the Baltic to the Crimea and the Caucasus. In gardens and parks, barberry is bred as an ornamental plant. Does not bear fruit when shaded. For medicinal purposes, roots are used that contain the alkaloid berberine and others. Organic acids, vitamins, carotenoids, and trace elements are found in the fruits.

Therapeutic action. Barberry has been known since ancient times: it was known as a medicinal plant in Ancient Babylon and India. In the Assyrian library, in the inscriptions on clay tablets, made in 650 BC, the fruit of the barberry is referred to as a "blood purifier." The roots of barberry have a choleretic, anti-inflammatory, sedative, diuretic, antispasmodic, tonic, antitumor, and some antimicrobial effect. A decoction of the bark and leaves of barberry is used to treat chronic pancreatitis, stimulate the pancreas and as an adjuvant in the treatment of diabetes. A liquid extract from the bark, branches and stems of barberry reduces the blood sugar content of rabbits with alimentary hyperglycemia (A.I. Karaev et al., 1955).

They are used in the complex treatment of diabetic patients, especially those complicated by inflammatory diseases of the liver, digestive tract, and obesity. A decoction of roots, less often leaves, is used in the form of rubbing into the skin of the feet with symptoms of a diabetic foot as an antiseptic, anti-inflammatory and tonic. Tincture of fruits is used as an antibacterial, hypotensive and sedative: in Bulgaria - for diseases of the spleen, stomach cramps; in France - to stimulate digestion, as an anti-febrile, bactericidal and blood pressure lowering agent, in Azerbaijan - to treat diabetes. Shrub fruits are widely used in phyto-diet.

Barberry preparations are contraindicated during pregnancy.

Application form

• Tincture of common barberry leaves, 30-40 drops 2-3 times a day. The course of treatment is 2-3 weeks.

• Berberine bisulfate 0.005-0.01 g (5-10 mg) 3 times a day before meals. The course of treatment is 2-4 weeks.

• Infusion of leaves: 10 g per 200 ml of boiling water. Take 1 tablespoon 3-4 times a day.

Periwinkle

Vinca minor L

A perennial evergreen plant from the kutrovy family, reaching a height of 25–35 cm. Stems are branched, creeping, capable of taking root. The creeping stem can reach 120–150 cm in length . Leaves on short petioles, opposite, elliptical, leathery, shiny. Single blue flowers are located in the axils of the leaves on long peduncles. Blooms in the first half of summer. Found in the Caucasus, Crimea, Ukraine, grows in shady forests, as an ornamental plant is bred in gardens and parks. For medical purposes, leaves are harvested, which are collected during the flowering of the plant. Dry them in a well-ventilated area or under a canopy in the shade. When collecting, drying and especially using it, it must be borne in mind that periwinkle is a poisonous plant. In medicine, leaves are used, which contain indole alkaloids (minorine, vincamine, vinine, pubiscin), triterpenes (vincamine, isovincamine, vincaminorine, reserpine, maidin, vinoxine, eburnamine, vincamedin, epivincamine, isomaydine, etc.), flavonoids, substances, ascorbic acid, carotene and other compounds (V.A. Kurkin).

Therapeutic action. Periwinkle has been used since the days of ancient medicine as a sedative that reduces dizziness and headache, and lowers blood pressure. The alkaloid vincamine isolated from it, when administered intravenously to rats at a dose of 0.2 mg / kg of body weight during the first 30 minutes, reduces the blood glucose concentration by 22 %,

but after 4 hours the sugar content rises to the initial level (AO Kaidor, 1977).

The drugs Vincapan and Devinkan have a vasodilator (mainly on the vessels of the brain), hypotensive and mild sedative effect. They are used for hypertension, cerebrovascular spasms, neurogenic tachycardia and other autonomic neuroses.

The infusion of periwinkle small, in addition, is used as a hemostatic (for uterine, intestinal bleeding), astringent and antimicrobial agent.

The small periwinkle plant is poisonous! It is necessary to follow the doctor's recommendations, drink infusions under the supervision of a qualified herbalist.

Application form

• Infusion of small periwinkle herb: 5 g per 200 ml of boiling water. Take 1/3 cup 3 times a day.

• Vincapan 0.005-0.01 g 2-3 times a day. Produced in tablets of 0.01 g. Manufactured in Poland.

• Devinkan 0.005-0.01 g (510 mg) starting 2-3 times a day, and then 3-4 times a day. Intramuscular injections of the drug are made only in a hospital setting. After improving the condition, they switch to taking pills. Manufactured in Hungary.

• Vincaton. The action is close to devinkan. Produced in Hungary.

Hanging birch (warty)

Betula verrucosa L

Deciduous tree of the birch family is a genus of deciduous trees and shrubs of the birch family (*Betulaceae*) 30–45 m high, with a trunk girth of 120–150 cm, some species are shrubs from large to small, up to creeping, barely rising above the ground. Birch is widespread in the Northern Hemisphere; on the territory of Russia it belongs to the most widespread tree species. The total number of species is about a hundred or slightly more.

Therapeutic action. Birch buds and leaves are used for medicinal purposes. GF XI approved for use dried outgrowths of the sterile form of the oblique tinder fungus - birch fungus (chaga). Birch buds and leaves contain essential oil, resins, flavonoids, tannins, saponins, hyperoside, carotene, ascorbic and nicotinic acids. Chaga contains humic-like chagic acid, polysaccharides, oxalic acid, steroid, sterol and other compounds.

Birch has a variety of properties: diuretic, choleretic, antispasmodic, anti-inflammatory, wound healing, antiviral, anthelmintic, antiparasitic. Birch preparations regulate metabolism, the function of the gastrointestinal tract and female genital organs. Useful for hypo- and vitamin deficiency, edema, especially of cardiac origin, atherosclerosis, stomach ulcers, chronic kidney disease and inflammation of the bladder, kidney stones, and spasms of the intestines and other smooth muscle organs.

One of the main products of birch bark processing is betulin, which has a wide range of biological properties. In this regard, it is of great importance to study the structure of betulin and substances similar to it, including derivatives. Betulin is a triterpene alcohol of the lupane series with the chemical formula C30H50O2 and the chemical name betulinol. It is found in hazel, calendula, licorice, etc. Betulinic acid blocks the growth of melanoma without harming normal cells. At present, biologically active additives are obtained from betulin and betulinic acid in industrial conditions. One of them - “Diabetuline” (additionally contains the fruits of blueberries and rhizomes and roots of elecampane) to improve the quality of life and prevent vascular complications in type 2 diabetes. “Diabetuline” underwent a study in a controlled

hospital environment on the basis of the Department of Metabolic Diseases of the Clinic of the Research Institute of Nutrition of the Russian Academy of Medical Sciences (2005). The trial involved patients with type 2 diabetes - men and women from 48 to 69 years old, with a disease duration from one to 20 years. When the drug was included in the complex treatment of these patients, a noticeable decrease in their oxidative stress, a decrease in the level of triglycerides in the blood serum, as well as a tendency to a decrease in fasting blood sugar and after a meal, and an improvement in glycemic control in general were recorded. Thus, the authors of the study concluded, “Diabetuline” as an integral part of the complex of therapeutic measures for type 2 diabetes can increase the glucose-lowering, antioxidant and lipid-lowering efficacy of treatment, which contributes not only to improving the quality of life, but also to increasing the prevention of vascular complications. It promotes the normalization of carbohydrate and fat metabolism, maintaining the functions of the pancreas, liver and biliary tract, improves the condition of the body in diabetes mellitus. In diabetes mellitus complicated by micro- and macroangiopathies, diabetuline exhibits antioxidant, angioprotective and hypolipidemic effects (Kh. Kh. Sharafetdinov et al., 2006).

The use of “Diabetuline” during pregnancy and lactation is not recommended, as no additional studies have been conducted.

Application form

• BAA “Diabetuline” inside before meals, 1-2 capsules per day.

Bryony white (step)

Brionia alba L

A perennial plant with a large, overwintering, fleshy tuber-like root. Stems are flexible, climbing up a support with antennae, up to 6 m long. The leaves are medium-sized, five-lobed, dark green, slightly pubescent with sparse, hard hairs. Flowers are small, yellowish, have no decorative value. The fruit is a black juicy berry. Ripe fruits are orange-red. Bryony is found on lime-rich clay soils, near roads and fences, in hedges, shrubs, and less often on forest edges. Bryony contains a highly laxative gum mixed with several cucurbitacins. The latter is due to a sharp irritant effect on the skin. Bitterness and saponins are of secondary importance.

Therapeutic action. The use of trihydroxyoctadecadienoic acids obtained from the roots of bryonia alba was studied in a rat model of alloxan diabetes. It has been established that these acids can correct most metabolic disorders typical of various forms of diabetes, as well as affect the formation of stable prostaglandins (AG Panossian, AS Oganessian, M. Ambartsumian et al., 1999). Due to the substances included in the plant, it is a potent laxative; and its reception often causes colicky pains. And although an analgesic effect has been found for gout and rheumatism, one cannot ignore the above side effects. The plant is widely used in homeopathy.

Briony is poisonous! The manifestation of poisoning can be severe pain (colic), diarrhea and even intestinal bleeding. Red fruits are also highly poisonous, therefore they are very dangerous, especially for children!

Application form

• Homeopathic oil for external use.

Common lingonberry

Vaccinia vitis idaea L

An evergreen shrub of the cowberry family. It has strong, erect, branched stems up to 25 cm high with leathery leaves. Above they are dark green, shiny, below - light green. The flowers are small, white or pink. Distributed in the forest and tundra zones of Russia up to the Arctic Ocean. For medicinal purposes, lingonberry leaves are used containing phenolic glycosides - arbutin and methylarbutin; derivatives of hydroquinone, tannin, hyperoside and other flavonoids. Lingonberry berries contain a large amount of sugars, ascorbic acid and carotene, organic acids (citric, malic, oxalic, benzoic, etc.). The glycoside arbutin is broken down in the body into sugar and hydroquinone, the latter having bactericidal properties. Berries flooded with water do not deteriorate until spring, as they contain benzoic acid, which protects them from damage. In terms of the total content of phenolic compounds and the total antioxidant activity, lingonberries are only slightly inferior to blueberries and significantly surpass red and black currants, cranberries and strawberries.

Therapeutic action. The generic name comes from the Latin baccinium - berry bush; vitis-idea - Indian grapes; Ida is a mountain in the north of Crete. Lingonberry leaves were used in Russia for diarrhea and urolithiasis. There have been cases when a patient who had suffered from salt deposits in his legs for many years recovered by taking lingonberry tea for several months. At a high temperature, squeezed juice from the fruit was given with water. For scurvy, diarrhea, lingonberry jam was recommended; with hemoptysis, consumption - steamed fruits mixed with oatmeal and honey.

Herbal preparations from lingonberry leaves (decoction, infusion) are used as a diuretic, choleretic, antiseptic and astringent for diseases of the kidneys and bladder (for example, for pyelitis, cystitis, urolithiasis), gastroenteritis, putrid diarrhea, flatulence and chronic constipation. Lingonberry leaf extract, like the tannins of this extract in vitro, has antibacterial activity against Helicobacter pylori (Annuk et al., 1999). Lingonberry leaves in the form of decoctions and tea are used for diseases associated with a violation of mineral metabolism, in particular for gout,

osteochondrosis, as well as for rheumatoid, infectious nonspecific arthritis. An aqueous extract of lingonberry berries in vitro inactivates the tick-borne encephalitis virus, and also increases the resistance of mice to this pathogen. Lingonberry berries have anti-rot and vitamin properties. They are used in raw food and in the manufacture of dietary products. Lingonberry leaves and fruits are used for avitaminosis C and A. An aqueous infusion of berries quenches thirst, therefore it is prescribed for febrile patients. In addition, the lingonberry infusion has a mild laxative effect.

A significant hypoglycemic effect under glucose loading in white rats has a decoction of lingonberry leaves (RK Adiev et al., 1961). If necessary, it can change the alkaline reaction of the medium to acidic in the treatment of cystitis and pyelonephritis. Lingonberry leaves are widely used as part of the collection in the treatment of diabetes mellitus.

Application form

• Decoction of lingonberry leaf: 6 g (2 tablespoons) of leaves are poured with 200 ml (1 glass) of hot boiled water. Take 1 / 2-1 / 3 glasses 2-3 times a day.

• Briquettes of lingonberry leaves. One slice of the briquette is poured with a glass of boiling water, insisted for 30 minutes, filtered, taken 3-4 times a day in a tablespoon.

• Collection “Brusniver”: prepare a decoction or infusion (1 briquette per 500 ml of water). Is taken orally 1/4 cup 3-4 times a day or topically in the form of irrigation, douching, baths, lotions (diluted 2 times) or microclysters 25-50 ml.

Elderberry black
Sambucus nigra L

A shrub or small tree of the honeysuckle family. It is found in deciduous forests of the southern regions of the

European part of Russia, in Ukraine and in the Caucasus. Often it grows as a weed in yards, orchards and vegetable gardens - sometimes as single individuals, sometimes in small groups. Medicinal raw materials - flowers and buds are harvested before the corolla shedding, cutting off the entire inflorescence with shears or scissors. Black elderberry flowers contain the glycoside sambunigrin, which is split into hydrocyanic acid, benzaldehyde and glucose; essential oil (0.27-0.32 %), choline, rutin, acetic, malic, chlorogenic, caffeic and valeric acids. The leaves contain sambunigrin (0.11 %), a laxative resin and a small amount of essential oil. Ascorbic acid (200-280 mg%) and carotene were found in fresh leaves . Essential oil, choline, triterpene compounds, ursolic acid in the form of methyl ester, betulin, α-amyrin, β-sitosterol, ceryl alcohol, phytosterol were found in the bark of the branches. The fruits contain ascorbic acid (10–49 %), carotene, sambucin, chrysanthemum, tannins (0.29–0.34 %), as well as carboxylic acids and amino acids (tyrosine). Fatty oil was found in the seeds (H. Hemgesberg, 2002).

The medicinal effect of black elderberry has been known for a long time. In the Middle Ages in Europe, elderberry was valued as a magical plant and provides an opportunity to look into your future. In one of the manuals of that time it is said: “Hollow out an elder cane from the lower end and put pounded wolf eyes and tongues from three green lizards, a dog’s heart, to this add iron powder and cover with an iron head - and this elder cane will protect on the way from to protect all kinds of misfortunes and from the beast of the forest and dashing people. “

From time immemorial in Russia, samovars were polished with bunches of black and red elderberries and used for home dyeing. With the bark of young twigs, mosquitoes, flies, cockroaches were driven out of the house and … alcoholism was treated. And among folk healers of Ukraine and Belarus, elderberry was known as a diaphoretic, diuretic, anthelmintic, emetic (that’s why it was used for alcoholism!). The bark was used to prepare a medicine for tuberculosis, bronchitis, colds and toothache. Powder of bark and roots was

used to sprinkle wounds, weeping ulcers in diabetic feet and burns, to treat bone fractures, dislocations, gout, etc.

Currently, in many countries of the world, medicinal forms of elderberry (infusion and tincture of flowers, decoction of young shoots) are used as a diaphoretic for colds, chronic bronchitis, bronchiectasis, as well as for flu and tonsillitis. It is recommended to rinse the mouth and throat with infusions from the flowers of the plant in case of inflammatory diseases of the oropharynx, with laryngitis and sore throat. With diabetes mellitus while taking antidiabetic drugs, an infusion of elderberry flowers is recommended, 1/4 cup 3-4 times a day after meals. They are also used externally in the form of lotions, wet dressings for burns, wounds, boils. For hemorrhoids, local baths of elderberry infusion are recommended.

Elderberry flower preparations are used for some functional disorders of the liver and as a diuretic for kidney diseases, including diabetic nephropathy, especially accompanied by edema. The laxative properties of the plant are used in combined herbal laxatives. Good results have been obtained in the treatment of myositis, neuralgia and joint diseases with elderberry flowers in the form of poultices.

Black elderberry flowers lower the threshold of excitability of the centers regulating sweating, so mild heat irritation is sufficient (for example, drinking a glass of hot elderberry infusion to induce sweating). Most often, elderberry is used in combination with other, similarly acting, herbs as a means of sweating for colds and always, when it is believed that sweating can have a healing effect. Flowers, fruits and leaves, which are used in traditional medicine for diabetes as part of the collection, have the greatest medicinal value for patients with diabetes. SM Kit and GG Orlik (1960) in experiments on rabbits with alimentary hyperglycemia discovered the hypoglycemic effect of black elderberry flowers.

Pharmacological studies of R.K. Aliev et al. (1966) found that liquid extract and dry preparations from elderberry leaves can be used as mild laxatives. This effect of elderberry

leaves is given due to the glycoside and resinous substances found in them.

Flowers and fruits of black elderberry have a laxative effect. Due to the content of vitamin C and carotene, young leaves and elderberry juice are used as a general tonic (especially fresh young leaves), in case of a spring breakdown, a glass of broth is prepared from 6-8 leaves, which is drunk before breakfast.

Studies have shown that the infusion of flowers has antimicrobial, antiparasitic and antiviral effects, which makes it useful for purulent diseases of internal organs, skin and mucous membranes, and also as an anthelmintic. They are also used externally in the form of lotions, wet dressings for burns, wounds, boils, trophic ulcers, diabetic foot. With diabetes mellitus in traditional folk medicine, black elderberry juice is prepared: squeeze fruit juice from flowers or ripe fruits, take up to one glass at a time with a tablespoon of honey 3 times a day (V.F. Korsun, E.V. Korsun, A. N. Tsitsilin, 2010). For hemorrhoids, local baths of elderberry infusion are recommended.

Nutritional value. The sour-sweet berries of black elderberry are edible and used in the food industry (to obtain food coloring for marmalades, dragees, caramels, creams for cakes and other confectionery products) and in the alcoholic beverage industry.

Application form

• Infusion of black elderberry flowers: 5 g (1 tablespoon) per 200 ml (1 glass) of hot boiled water. Take in warm or hot form, 1 / 2-1 / 3 cup 2-3 times a day (do not sweeten).

Cultural grapes

Vitis vinifera L

A perennial plant of the grape family with a powerful root system and a flexible stem, similar to a vine, it is called a vine. With the help of tendrils, the plant clings to trees if it grows in natural conditions, or to props if it grows on a personal plot or in farms where grapes are grown. More than 150 biologically active substances have been identified in grapes. The peel of the fruit contains wax, phytosterol substances - vitins, essential oil, tannins and dyes. Fruit juice, depending on ripeness and varieties, contains up to 20 % sugars, protein, fats, fiber, hemicellulose, pectins, pentosan. Also contains organic acids - tartaric, citric, oxalic, malic. The fruit also contains the glycosides delphinidin and didelfinidin. Grape juice contains vitamins B1, B2, B6, B12, C, P, PP, folic acid.

Therapeutic action. Grape fruits improve metabolism, are a source of vitamins, macro- and microelements, promote the elimination of uric acid from the body. The juice has a diaphoretic, tonic, laxative, restorative effect. Ripe grapes, due to the significant amount of sugar in the fruit, are not recommended for diabetic patients. Found in grape skins, the substance resveratrol stops cellular damage to blood vessels, preventing the serious consequences of diabetes caused by increased glucose production in diabetes. As noted by physicians from Peninsula Medical School (UK), resveratrol helps cells to activate protective enzymes to prevent the production of free radicals. The antioxidant acts in such a way that it blocks their negative ability to influence the cellular structure.

A.I. Karaev et al. (1955) noted the hypoglycemic activity of fermented juice of unripe grapes in alimentary hyperglycemia in rabbits.

Grape treatment is not used for diabetes, severe obesity, peptic ulcer disease, acute heart failure. Since grapes and their juices can cause tooth decay, you should rinse your mouth with water after eating them. Sometimes there is a food allergy to grapes - usually in children.

Application form

• The pharmaceutical industry produces the drug Vitachol from grape leaves.

• Infusion of grape leaves: pour 1 tablespoon of dry crushed leaves with boiling water (1 glass), leave for half an hour and strain. Take the broth 3 times a day half an hour before meals, 1-2 tablespoons.

Medicinal galega (goat's rue)
Galega officinalis L

Perennial herb from the legume family. The popular name for this herb is goat's rue. And it got this name because it is grown as a fodder and very valuable agricultural crop. Galega is a very branched and vigorous grass, reaching up to 1 m in height. Plant with pinnate leaves. The flowers of a bluish or grayish-purple color in the plant are collected in a brush, in appearance the flowers are similar to a bell. The fruit is a pod that contains many seeds and has longitudinal depressions on each side. The flowering of the plant begins in early summer and lasts the entire summer period until early autumn. The herb contains the alkaloid galegin; tannin, saponin, etc. The aerial part of the galega contains 0.11-0.2 % of alkaloids. Aliphatic alkaloids: galegin (isoamylene guanidine) (C6H13N3) (Barges, 1923), 4-hydroxigalegin, d, 1-peganine (C11H12ON2) 2,3 (oxytrimethylene) - quinosolone-4 (C11H10O2N2) (V.P. Linyuchev) A.I.Bankovsky, 1959). Isolated from raw materials: flavone glycoside galuteolin, which is hydrolyzed to glucose and luteolin; tannins, bitter substances, sugars, etc. (Hoppe, 1975). The seeds contain 4–5 % fatty oil and 0.5 % galegin alkaloid (Belyaev).

Therapeutic action. The history of the use of biguanides dates back to the Middle Ages, when galega (French lily) was used to treat diabetes mellitus. At the

beginning of the 19th century, the alkaloid galegin (isoamyleneguanidine) was isolated from this plant, but in its pure form it turned out to be very toxic. In 1927 Simmonet and Tanret observed that under the influence of a gaunetidine derivative - galegin, which is contained in raw materials, the blood sugar level in rabbits decreased by 50-60 % under the influence of a dose of 75 mg / kg of body weight. Sendrail et al. (1975) observed a significant increase in beta cells in langerhans islets, correlating with a decrease in blood sugar levels. In volunteers with normoglycemia, it was found that galegin in a dose of 2-4 mg / kg causes a decrease in blood sugar, which occurs after 3-4 hours and lasts about 9 hours. A more pronounced hypoglycemic effect was observed in diabetics (Benigni, Capra, Cattorini, 1954) …

According to L.A. Lapynina (1972), the main groups of biologically active substances that determine the hypoglycemic effect of galega are amino acids and a complex consisting of guanidine derivatives, flavonoids and phenolcarboxylic acids. Along with flavonoids, the author used plant alkaloids, which determine both the action and the potential toxicity of galega, as a marker for developing the technology for preparing the drug. Analysis of the results of evaluating the hypoglycemic effect of various extracts from the aerial part of the plant suggests that the most rational extractant is 40 % ethanol and water.

Galegin has an antihyperglycemic, diuretic, diaphoretic, lactic-producing (increases milk production) and antihelminthic effect. Internal use of galega, as a poisonous plant, requires caution. Goat’s rue preparations are synergists of sulfonamide synthetic preparations.

“Galega-Nova” contains extracts of galega and nettle herbs, dandelion and burdock roots, rose hips; dried carrots, fructose. The chemical composition is represented by a complex of biologically active compounds: glycoside galegin, carbohydrates, flavonoids (kaempferol, rutin, quercetin), organic acids (citric, malic), vitamins A, B1, B2, E, C, K and P (rutin), carotene, carotenoids, lycopene and rubixanthin. Inulin, fatty oil (which includes glycerides of palmitic, oleic and linoleic acids), pantothenic, palmitic and stearic acids,

sitosterol, stigmasterol, phytosterol, mucus, tanning, pectin and resinous substances, mineral salts (calcium and potassium trace elements (iron, manganese and phosphorus), bitterness.

Biologically active food supplement “Galega-Nova” has a complex effect on the state of the vascular system, reduces the level of glucose and cholesterol in the blood, exhibits antiatherosclerotic, vaso-strengthening effects, normalizes water-salt, carbohydrate, fat metabolism, which allows this parapharmaceutical to be used in a number of forms course and complications of diabetes mellitus. The complex of extracts of burdock root, rose hips, carrots also provides anti-inflammatory, antipyretic, laxative, diuretic effects.

Indications for use are the prevention and enhancement of the effect of drug therapy for diabetes mellitus type 1 and 2, diabetic complications from the eyes, kidneys, lower extremities; various forms of obesity; obliterating atherosclerosis of the vessels of the lower extremities; varicose veins; rheumatism, gout.

We recommend 1 teaspoon of granules dissolved in 100 ml of warm water per day. With diabetes under the supervision of a physician: it is possible to take 1 teaspoon of granules 3 times a day. The course is from 1 to 3 months.

Galega is used as a diaphoretic and antihelminthic agent. Plants have a synergistic hypoglycemic effect: eucalyptus, lettuce, mulberry, blueberry, olive, walnut, juniper, while dill, anise, angelica (angelica), caraway and nettle have a synergistic lactogonic effect (Valnet, 1972).

Contraindications: individual intolerance to the components of dietary supplements.

Application form

• A decoction of herbs in a dose of 1 teaspoon per glass of boiling water is taken 1-2 tablespoons 3 times a day.

• Decoction of seeds: 1:20; 1 tablespoon 2-4 times a day.

• “Galega-Nova” 90 g of granules in plastic packaging. Granules from light brown to brown in color with a specific aromatic odor and pleasant taste, easily dissolve in water, which ensures their high bioavailability.

Sowing peas
Pisum sativum L

An annual herb of the legume family. Cultivated as a food plant. Seeds are used for food, for medicinal purposes - seeds and grass (stems, leaves, flowers). Seeds are harvested in July - August, herbs - in June - July. Pea seeds contain up to 23 % protein, 46.5 % starch, 2 % fat, lectins, B vitamins, vitamin C, carotene, potassium, phosphorus, manganese salts, 28.5 mcg% selenium, choline, methionine, etc. Iron in legumes 3 times more than in meat. Proteins are represented by amino acids - cystine, lysine, tryptophan, etc. (EA Orlova, 2001).

Therapeutic action. The pea culture dates back to the Stone Age. In ancient China, peas were a symbol of fertility and wealth. According to Avicenna, a decoction of peas (chickpea) is useful for dropsy and jaundice. A decoction of black chickpeas with wild radish oil and parsley crushes stones in the liver and kidneys. Peas have long been used in traditional medicine as a choleretic and diuretic. The seeds and flaps of the sowing pea affect carbohydrate metabolism and are used in traditional medicine for diabetes (II Brekhman, 1953). Peas help control diabetes because carbohydrates are made up of glucose and fructose, which travel (without insulin assistance) directly into the bloodstream. Given the high content of lectins in pea seeds, D. N. Sukharev (2005) investigated the spectrum of pharmacological activity of these natural compounds. Under experimental conditions, it was found that pea lectins stimulate the production of the main

regulatory peptides (anti-inflammatory and regulatory cytokines), which results in an increase in the antitumor activity of blood lymphocytes. Pea lectins have a pronounced immunomodulatory effect from 5 to 20 μg / ml. Pea lectin (aD-glucopyranose, PSA) causes a statistically significant cytotoxic effect of MNCs on colorectal cancer cells.

Unripe seeds - green peas are recommended in fresh, dried and canned form in dietary meals. Gruel from unripe (green) pea seeds in pure form or mixed with egg white is recommended to be applied topically for the treatment of erysipelas of the skin, eczema, purulent wounds and diabetic foot.

Nutritional value. Peas are important in nutrition. Peas were widely used as a food plant in ancient times. Various pea dishes, especially pea stew, were also very popular in Russia.

Peas cause increased flatulence in some individuals. To eliminate these phenomena, use a tincture of dill (dill water) or mint.

Application form

• In the form of various culinary dishes.

• Piflamin (Ukraine) - a preparation containing the sum of flavonoids and lectins from the herb of sowing pea.

Forest anthem (gourmar)

Gimnema sylvestre

Curly liana with a stem up to 8 m in length from the family Asclepiadaceae. The leaves of the plant are elliptical or oval, more or less pubescent on both sides. Small yellowish flowers. Grows in open woods at an altitude of 100-1000 m in India, China, Indonesia, Japan, Malaysia, Sri Lanka, Vietnam

and South Africa. The pharmacological properties of the plant are due to a group of more than twenty triterpene saponins known as Gymnemic Acids. The leaves of the forest anthem contain 4-10 % saponins, including hymnemic acids and hynemosaponins.

Therapeutic action. Gourmar is a medicinal herb known in Ayurveda as a “sugar breaker”. Studies have shown its ability to slow down the absorption of sugar into the bloodstream and its deposition in body fat. Gymnemic acids have been proven to have antidiabetic activity, and gourmarine, another component isolated from leaves, has the ability to block the sensation of sweet taste in humans (A.A. The composition of the carbohydrate part of triterpene saponins includes monosaccharides: D-glucose, D-galactose, D-xylose, etc. Intramuscular administration of an alcoholic extract of Gymnema forest and Indian cochinia at a dose of 200 mg / kg of body weight in rats eliminates hyperglycemia caused by growth hormone and corticotropin the forest anthem is more effective (SS Gupta, 1962).

Recently, in European countries, in Japan, Korea, and the USA, they are actively working with herbal extract in terms of creating a drug of a new type of action. The results of the study indicate that the hypoglycemic activity of forest anthem is due to the stimulation of insulin release (and, possibly, the restoration of beta cells of the islets of Langerhans), stimulation of enzymes responsible for glucose utilization and inhibition of glucose uptake in the intestine.

In the Volgograd Medical Academy, together with the Russian Research Institute of Health, a new original anti-diabetic drug “Diabetta” (a herbal composition based on forest anthem and extracts of elecampane, licorice, grape ridges) has been developed. The action of the drug is based on modulation of incretin activity in combination with antioxidant, hemorheological and immunomodulatory properties for monotherapy of mild severity of non-insulin dependent diabetes mellitus and prevention of complications. It is also useful in combination with oral hypoglycemic agents to compensate for non-insulin dependent diabetes mellitus complicated by angiopathies.

V.V. Pisarev et al. (2007) studied the effect of the hypoglycemic drug “Diabetta” based on the incretin modulator of the forest hymnam extract on the regeneration and apoptosis of beta cells. Investigated the tissue of the pancreas in male rats with an experimental form of streptozotocin-induced diabetes mellitus, who received Diabetta for 30 days at a dose of 280 mg / kg. In the group of animals with diabetes, a moderate amount of monoclonal antibodies to the nuclear antigen of proliferating cells of PCNA-positive cells in all parts of the pancreas was noted. Expression of caspase-3 was pronounced. The use of “Diabetta” promoted the activation of reparative processes in beta-endocrinocytes in experimental diabetes, which was confirmed by a high level of PCNA expression and moderate expression of Ki-67, and also prevented the development of apoptosis in endocrinocytes of pancreatic islets.

Carb Block also contains Gymnemalin ™, which has a hypoglycemic effect and, when combined with chromium compounds, alpha lipoic acid and vanadium, leads to increased insulin sensitivity and aids insulin release from carbohydrate-rich foods.

Application form

• Tablets “Diabetta” 0.84 g in a dose of 1-2 tablets 2 times a day.

Highlander bird (knotweed)
Polygonum aviculare L

An annual herb of the buckwheat family. For medical purposes, the herb of a plant is used, which contains a large amount of ascorbic acid, vitamin K and provitamin A (carotene), as well as the flavonol glycoside avicularin, tannins and silicic acid compounds (S. Ya.Sokolov, I.P. Zamotaev, 1994).

Therapeutic action. Galenic forms prepared from the plant increase diuresis, excrete excess sodium and chlorine ions in the urine, as a result of which filtration in the renal glomeruli increases and the reverse resorption in the renal tubules decreases, showing the detoxification function of the kidneys. The dried herb is a part of antidiabetic tea (J. Muszynsk, 1936). A single oral administration to rats with alloxan diabetes of Knotweed's infusion reduced the glucose level by 22 %, and its application within 7 days - by 68 %. At the same time, the concentration of fatty acids reached the initial level. The content of zinc in beta cells of pancreatic islets of the pancreas of intact rats and rats with alloxan diabetes increased under the influence of infusion of Knotweed, indicating an increase in the amount of insulin. Knotweed infusion promoted the accumulation of insulin in the beta cells of the pancreatic islets (SM Kit et al., 1977), as well as a decrease in cholesterol and beta-lipoprotein levels.

Knotweed increases the contraction of the uterus, and in no case should it be used during pregnancy. It is necessary to treat it with caution with varicose veins, thrombophlebitis.

Application form

• The juice of fresh knotweed herb is used to treat bleeding or old wounds and ulcers. Moisten a napkin with juice and, after washing the wound with the same juice, put it in place of damaged tissues with diabetic foot.

• Collecting herbs: horsetail herb - 20 g, knotweed - 20 g, strawberries - 20 g, astragalus - 15 g, goat's rue (galegi) - 15 g, arnica - 5 g, plantain leaves - 15 g. a glass of boiling water, boil for 3-5 minutes, leave for 10-15 minutes. Strain. Take 2 tablespoons 20-30 minutes before meals 3-4 times a day for diabetes.

Common pomegranate

Punica granatum L

Fruit tree of the pomegranate family. Leaves are oval, light green, 3 cm long. Forms spherical pomegranate fruits with leathery pericarp and numerous juicy seeds. Lives up to 50 years, reaching a height of 5-6 m. Branches are thin, thorny, glossy leaves, funnel-shaped orange-red flowers with a diameter of 2.5 cm or more. The fruit is about the size of an orange, with the peel from orange-yellow to brownish red. Productivity 50-60 kg per tree. Wild-growing pomegranate is also widespread in the Eastern Transcaucasia. In Azerbaijan, wild pomegranate thickets in the Lenkoran-Astara massif occupy an area of several hundred hectares. The juice and pulp of seeds of ripe fruits of cultivated varieties of pomegranate contains up to 20 % sugar, from 0.2 to 9 % acids, including citric 5-6 %, and a small amount of malic acid. Pomegranate juice contains 0.208-0.218 % of minerals, including manganese, phosphorus, magnesium, aluminum, silicon, chromium, nickel, calcium, copper. Vitamin content (mg%): C - 4.0–8.7; B1 - 0.04-0.36; B2 - 0.01-0.27; B6 - 0.50; B15 - 0.54; quite a lot of P-vitamin-like substances, niacin, traces of vitamin A and folacin. The juice of wild varieties of pomegranate contains 5–12 % sugar, and acidic acids - more than 10 %. Tannins and dyes in pomegranate juice 0.82-1.13 %, flavonoids, including anthocyanins, 34.0-76.5 %. In addition to phenolic compounds, pomegranate juice contains 15.5–29.2 mg% catechins, about 2 % proteins, 61–95 mg% amino acids. Of these, 15 amino acids were identified: cystine, lysine, histidine, arginine, aspartic acid, serine, threonine, glutamic acid, alanine, hydroxyproluine, alpha-aminobutyric acid, 6-20 % of a fatty oil consisting of linoleic acid (40.03 %), palmitic (16.46 %), oleic (23.75 %), linolenic (2.98 %), stearic (6.78 %), begonic (1.63 %) acids. In addition, 3.4 % nitrogenous substances, 12.6 % starch, 22.4 % cellulose. Pomegranate oil contains 272 mg% vitamin E. Pomegranate flowers contain the dye punicin. The leaves of this plant contain 0.2 % ursolic acid.

Therapeutic action. As Hodgson writes, like figs, grapes, olives, pomegranate claims to be one of the first places in the earliest annals of history, since in terms of its consumer value it occupied a place among primitive people along with cereals and honey, which served as the main food of man from the first steps of civilization. … The pomegranate fruit is delicious and very healthy. The pulp of the grains, tender and juicy, is used for food, and the peel, seeds, flowers, leaves of this plant are used in folk medicine for the manufacture of various medicines that help in the treatment of many diseases. The beneficial properties of pomegranate are justified by the high content of manganese in it, which is necessary for the normal functioning of the body. Pomegranate fruits are one of the few sweets that are not only acceptable, but also useful for diabetics. To do this, consume 60 drops of juice 4 times a day before meals. Already on the 3rd day, your blood sugar level will significantly decrease.

In Azerbaijani traditional medicine, condensed natural pomegranate juice is used for diabetes It is believed that pomegranate in diabetes has properties that can lower blood sugar levels, although scientific evidence on this issue is conflicting. But pomegranate flowers and seeds provide health benefits for diabetes and patients with hyperglycemia, due to the high content of antioxidants in them.

With gastritis with high acidity, this sour fruit is completely contraindicated! The consumption of large amounts of decoctions and infusions from the fruits and pomegranate bark can lead to dizziness, general weakness, nausea, vomiting, and even seizures.

Sowing buckwheat

Fagopyrum sagittatum gilib

An annual herbaceous buckwheat belongs to the buckwheat family. Favorite buckwheat came to our tables from Central Asia. Buckwheat is rich in protein (10-16 %), lectins, starch (80 %), fat and fiber. Buckwheat contains many minerals, especially calcium, phosphorus and copper, zinc, boron, cobalt and nickel. By the way, copper, together with iron, participates in hematopoiesis and the formation of hemoglobin, heals anemia. Zinc, as you know, ensures the normal absorption of many substances, especially with increased radiation, diabetes mellitus. Organic buckwheat acids - maleic, citric, menolenic, oxalic - improve digestion, especially in diseases of the gastrointestinal tract. Buckwheat contains vitamins B, P and PP. The aboveground part of buckwheat during the flowering period contains useful flavonoids and anthocyanins. Lysine, tryptophan and other amino acids contained in buckwheat are assimilated at the level of legumes, and buckwheat is not inferior in nutritional value to animal products. Buckwheat fats are resistant to oxidation, buckwheat groats can be stored for a long time, while the composition of nutrients will practically not change.

Therapeutic action. Buckwheat fiber has a low glycemic index. Canadian doctors claim that buckwheat fiber reduces glucose levels by 20 %. The active substances in buckwheat make tissues more sensitive to insulin, normalize the metabolic mechanism and compensate for diabetes. In some cases, low-magnesium lectins found in buckwheat cause insulin resistance. The organic acids that are part of this cereal have a beneficial effect on digestion, and a high concentration of malic and citric acids helps to better absorb food. It is good to use buckwheat for diseases of the gastrointestinal tract and pancreas, overweight, metabolic disorders and diabetes mellitus (F.I.Formazyuk, 2003).

Nutritional value. NP LLC “Zhitomirbioprodukt” produces buckwheat with inulin, which is useful in the diet of patients with diabetes.

In large quantities, buckwheat is contraindicated in a number of diseases of the digestive system (gastritis, gastric ulcer and duodenal ulcer), during pregnancy and lactation, as well as in case of individual intolerance. For people with increased blood clotting, buckwheat preparations are contraindicated. It is also not recommended to ingest fresh buckwheat flowers and leaves inside, as this can cause poisoning, especially in persons of the fourth blood group. Fresh buckwheat grass and flowers are slightly poisonous.

Application form

• The pharmaceutical industry produces drugs obtained from the flowering tops of buckwheat - rutin and urutin, which are used to treat hypertension, measles, scarlet fever, and radiation sickness. Rutin is available in tablets, often in the form of a drug combined with ascorbic acid. Rutin tablets 0.02 g are taken 3 times a day.

Elecampane high
Inula helenium L

Perennial herb of the Asteraceae family. The flowers are yellow or orange, solitary or collected in racemose or corymbose common inflorescences. Bloom in summer in the second half. For medicinal purposes, the rhizomes and roots of elecampane are used, containing up to 41 % inulin, bitterness, pseudoinulin, essential oil, the main component of which is helenin - a mixture of various types of lactins (alantolactone, etc.), vitamin E, saponins, resins, gums, mucus , pigments, polysaccharides, trace elements of selenium, boron, zinc, copper, aluminum, etc.

Therapeutic action. Elecampane tall refers to the ancient medicinal plants, which were widely used in their time by the doctors of the era of Hippocrates, Dioscorides, Pliny. This plant was used in the practice of Avicenna. Pliny wrote

that elecampane grew out of the tears of Elena, the daughter of Zeus and Leda, whose abduction by Paris, according to legend, was the pretext for the Trojan War.

It should be noted that it was in the roots of elecampane that inulin was discovered as a chemical in 1804. As you know, patients with diabetes mellitus are recommended inulin instead of sugar and starch. Elecampane drugs have anti-inflammatory, antimicrobial, choleretic, expectorant, antiulcer and diuretic properties. The normalizing effect of elecampane preparations on the secretory activity of the gastrointestinal tract has been proven. In a number of sesquiterpene lactones isolated from the plant, there was a slowdown in the intestine and its secretory activity, and at the same time, an increase in the excretion of bile into the duodenum, which, in combination with an antiseptic effect, has a positive effect in the treatment of all digestive organs. Infusion and decoction of elecampane roots, as well as fresh leaf juice, improves the course of diabetes mellitus (A. I. Karaev, 1964; N. Kh. Ibragimova, N. V. Paskhanova, 1967). M. Kh. Enikeeva et al. (2006) studied the effect of the combined use of oil extracts from elecampane and burdock roots on glucose in patients with newly diagnosed type 2 diabetes. There were 25 patients of both sexes. All patients, along with diet and exercise, were prescribed oil extracts from elecampane and burdock roots in a 1: 1 ratio, 1 teaspoon 3-4 times a day for 12 weeks. As a result of clinical observations after 4-5 weeks of treatment, 25 % of patients achieved clinical and laboratory compensation for diabetes (fasting glucose - 6.1 ± 0.2 mmol / L, and after 12 weeks - 5.8 ± 0.25 mmol / l).

Under the action of lactones, in particular alantone, blood circulation in the gastric mucosa is increased, the regeneration process is accelerated, and the production of buffer substances is stimulated. It is clinically proven that the drug alantone, obtained from elecampane, increases blood circulation in the gastric mucosa, accelerates the healing process of ulcers, increases the amount of bound hydrochloric acid and reduces the content of pepsin, which has a positive effect on the course of the disease.

The essential oil of elecampane, due to the content of alantolactones, which are close in biological action to santonin, has anthelmintic properties, but surpasses it by 25 times in anti-ascariasis effect (V. Petkov, 1988), which makes it possible to recommend elecampane preparations in the treatment of helminthic invasion. Elecampane preparations are used in the treatment of gastritis, gastric ulcer, helminthic invasion, acute and chronic respiratory diseases (bronchitis, tracheitis, flu, etc.).

Elecampane is not recommended for use in severe diseases of the cardiovascular system, kidneys, during pregnancy. It should be remembered that high elecampane preparations can only be used as directed by a doctor. In case of an overdose, symptoms of poisoning may appear.

Application form

• Decoction of rhizomes and roots of elecampane high: 16 g (1 tablespoon) per 200 ml of water. It is taken warm, 1/2 cup 2-3 times a day, 1 hour before meals.

• Alanton. Assign 0.1 g 3 times a day after meals for 6-8 weeks. The drug is indicated for long-term non-scarring stomach ulcers, diabetes mellitus.

Ginseng

Panax ginseng CA May

Perennial herb of the Araliaceae family. The generic name panax - from the Greek words “pan” - everything and “ake” - to heal, that is, a remedy for all diseases, a panacea. By the way, Panacea was the name of one of the daughters of the ancient Greek god - the healer Asclepius (Aesculapius). “Ginzeng” is the Chinese name for the root, derived from

“zhen” - a person and “shen” - a root. Grows wild in shaded areas of mixed and cedar forests of the Ussuri taiga in the Primorsky Territory and the southern part of the Khabarovsk Territory. Due to the limited natural resources, ginseng is cultivated in the Far East, in the Tver province and in Belarus. In laboratories and in special factories on artificial media, it is possible to grow ginseng biomass by cell culture. Medicinal raw materials - ginseng roots and biomass, which contain essential and fatty oils, sugars, starch, pectin substances, fiber, nitrogenous and nitrogen-free extractive substances, enzymes, B vitamins, iron, phosphorus, sulfur, manganese and other trace elements. The triterpene glycosides (panaxosides) contained in the roots - A, B, C, D, E, F.

Therapeutic action. The variety of pharmacological properties of ginseng root determines a wide range of its use in medicine. In China and Korea, it has long been considered a symbol of justice and goodness, a guarantee of a happy life, a cure for all diseases and ailments. Ginseng preparations are used as tonic and restorative agents for the treatment and prevention of various diseases of the central nervous system, in particular, various neuroses, increased fatigue, increasing the level of performance and body resistance to stressful situations, adverse environmental influences.

Even in the recommendations of traditional medicine of the East, the antidiabetic properties of ginseng root are mentioned. The experiment revealed the regulating effect of ginseng in hyperglycemia of various origins (II Brekhman, 1957).

Androgen receptor modulators (ginseng and ginsengoids) in various preparations promote their direct binding to the androgen receptor. As a result, androgenizing manifestations, improved performance and a hypoglycemic effect are observed (G. Yu. Babadzhanova, A. Wolf, 2006).

During the course of 6-day administration of a dealcoholized tincture of ginseng root to rats and mice, its preventive and therapeutic effect in alloxan diabetes was revealed. Thus, in rats during the glucose tolerance test (GTT), the level of glycemia in healthy, intact and diabetic animals

treated with tincture of ginseng root was the same. Therapeutic and protective course administration of ginseng affects not only the glycemic level, but also the glycogen content in the liver tissue. Internal use of a dealcoholized tincture of ginseng roots at a dose of 1.5 g / kg for 8 days restored the ability of the beta cells of the islets of Langerhans to respond with the release of insulin and C-peptide to an increase in the concentration of glucose in the blood.

At the same time, IV Dardymov (1976) proved that in the antidiabetic action of ginseng and eleutherococcus preparations, their ability to prevent the inhibitory effect of diabetic beta-lipoprotein on the penetration of glucose through membranes into cells and on its phosphorylation by hexokinase is essential.

Interest in the practical study of the effect of ginseng on carbohydrate metabolism arose after the report of Saito (1915), who observed a good therapeutic effect of this plant in the treatment of patients with diabetes. The therapeutic effect of ginseng in diabetes mellitus was associated with an increase in the body's tolerance to carbohydrates. In experiments on rabbits with adrenaline and alimentary hyperglycemia, the antidiabetic effect of ginseng was noted. Patients with diabetes are recommended long-term use of ginseng tincture inside, 20-30 drops 2-3 times a day (L. D. Shulyatyeva et al., 1963).

Less studied is the use of a liquid extract from ginseng root for the treatment of patients with mild and moderate diabetes (D. A. Balandin, 1954; L. I. Tank, 1955). According to N.N. Chernoyarov and O.N. Naletov (1956), ginseng extract in a dose of 0.5 ml 2 times a day when taken orally after meals in 13 of 19 patients improved their general condition, mood, and efficiency. Blood sugar levels decreased in 6 out of 19 patients.

The use of ginseng in the recommended doses is usually not accompanied by side effects, however, sometimes taking medications can cause some discomfort, nausea and vomiting,

increased blood pressure, and headache. Stopping the drug or reducing its dose leads to the disappearance of side effects.

Contraindications to the use of ginseng have not been identified, but it is not recommended to prescribe it for acute infectious diseases and other acute current pathology.

Application form

• Tincture of ginseng - prescribed internally 15-25 drops 3 times a day before meals.

• Tincture “Bioginseng” - indications for use, duration of treatment courses, contraindications are the same as for tincture of ginseng.

• Decoction of ginseng roots: 8-10 g is placed in an enamel bowl, pour 200 ml (1 glass) of hot boiled water, cover with a lid and heat in boiling water (in a water bath) until the liquid boils down to 50 %, the broth cooled at room temperature, filtered. Take 1-2 teaspoons 3-4 times a day.

• Powder or film-coated tablets, take 0.15-0.3 g 3 times a day.

Zamaniha high

Echinopanax elatum Nakai

Shrub of the Araliaceae family 1–1.5 m high. Leaves are shallowly palmate-lobed (5–7), with sharp double teeth, on long spiny petioles. Dark green above, glabrous, lighter below, spiked along the veins and petiole. The flowers are small, greenish, collected in simple umbrellas, from which a paniculate raceme is formed. The fruit is a berry-like, orange-red drupe. Blossoms in July; fruits ripen in September. The plant got its name from the presence of thorns that cling to clothing and are difficult to separate. Distributed in the forests of the southern part of Primorsky Krai. Habitat: spruce, fir and birch forests, rarely grows on scree, mainly on humus soils

and at high air humidity. The leaves, stems and rhizomes of zamaniha contain from 2.7 to 5 % essential oil, which includes alcohols, aldehydes (up to 10 %), phenols (3 %), free acids (4 %), lignans, alkaloids, minerals … The largest amount of essential oil was found in the roots and rhizomes of plants (1.8 %). The active complex is made up of triterpene saponins - echinoxosides, flavonoid glycosides, coumarins, resinous substances.

Therapeutic action. An experimental study of the high lure was first carried out at VILAR (I.B.Shulutko, 1976). Investigated a tincture prepared by maceration from plant roots in 40 % alcohol in a ratio of 1: 5. There is evidence of the antagonism of the action of glucocorticoids and preparations of bait, aralia and eleutherococcus, for example, experiments on rats have shown that preparations of leaves of bait change the tolerance of rats to sugars and cause hypoglycemia. Drugs from zamanikha reduce the amount of sugar in the blood in hyperglycemia in patients with diabetes and alloxan diabetes in experimental animals. Stable normalization of carbohydrate metabolism indicators was achieved in patients with mild and moderate severity when taking 40 drops of tincture. The effect of the drugs depended on the severity: the observation period was from 1 to 5 years. In severe diabetes, the hypoglycemic effect was poorly expressed. However, with the combined use of tincture and insulin, the concentration of sugar in the blood and urine decreased significantly more than with the introduction of only one insulin, which made it possible to reduce the insulin dose by 10–20 units. (A.I. Klimakova, M.A.Katsman, 1958; P.G. Gubin, 1959; A.D. Turova, Ya.A. Aleshkina, 1962; D. Ya. Shurygin, 1969; N. A. Skrobonskaya , 1977). The use of zamanikha tincture in the complex treatment of patients with diabetes mellitus is most effective in cases when symptoms of adynamia are noted in the clinical picture. Along with some hypoglycemic effect, there is an increase in tone, mood, efficiency. Appointment of tincture of zamaniha (10 drops 3 times a day) to children who are difficult to adapt to school conditions eliminates the symptoms of asthenia (I.B.Shulutko, 1976).

Individual intolerance; hypertonic disease.

Application form

• Tincture with 70 % alcohol.

St. John's wort
Hypericum perforatum L

Perennial herb of the St. John's wort family. The flowers are yellow, with a large number of stamens, fused in 3 bunches. Blooms in June - July. St. John's wort grows in forests, in glades, in gardens, in meadows, along roads, in wastelands. Collect the upper part of the plant - stems, leaves, flowers, fruits. And then they are dried in the shade in the fresh air, periodically turning the raw materials. The herb has a pleasant peculiar smell. For medical purposes, the herb Hypericum perforatum and a close species - St. John's wort or tetrahedral, which contain flavonoids (hyperoside, rutin, quercitrin, isoquercitrin and quercetin), fluorescent, coloring and tannins, carotene, hypericin, essential oil, resin nicotinic and ascorbic acids, vitamins P and PP, choline, anthocyanins, saponins, alcohols, traces of alkaloids and other compounds (S. Ya. Sokolov, IP Zamotaev, 1984).

Therapeutic action. Anti-inflammatory granulating tissue, disinfectant, choleretic, anti-burn, spasmolytic of smooth muscles, increasing renal blood flow, urolithic (urolithiasis: oxalate, urate, phosphate), enhancing the secretion of gastric juice, photosensitizing, epithelizing. St. John's wort preparations have long been used for metabolic diseases. J. Muszynski (1956) recommends St. John's wort for diabetes. The herb St. John's wort is part of the antidiabetic collection "Arfazetin".

According to the clinical observations of A. D. Turova (1974), when taking an infusion of St. John's wort inside, 100 ml 3 times a day for 1-2 months in patients with chronic gastritis pain, heartburn disappeared, the acidity of gastric juice returned to normal.

St. John's wort preparations are used for dyskinesias of the biliary tract and intestines, hepatitis, stagnation of bile in the gallbladder, cholecystitis, with the initial symptoms of gallstone disease, with gastritis with secretory insufficiency, flatulence, as well as with a decrease in the filtration capacity of the kidneys, functional insufficiency of the renal glomeruli with fluid retention and electrolytes in the body. In some cases, St. John's wort preparations are prescribed for peripheral circulatory disorders with symptoms of stagnation (diabetic angiopathy), and for microcirculatory disorders.

You can use St. John's wort preparations only after consulting a doctor or under the direct supervision of specialists. Do not use St. John's wort preparations for pregnant and lactating women. St. John's wort herb should be used with caution in the elderly.

Application form

• Infusion of St. John's wort: 2 g (1 teaspoon) of raw materials per 200 ml of water. It is taken orally 1/3 cup 3 times a day 30 minutes before meals.

• Briquettes of St. John's wort herb weighing 75 g, divided into 10 equal parts. One slice is poured with a glass of boiling water, boiled for 10 minutes, cooled, filtered, taken orally (for colitis, diarrhea) *1/2* cup 3 times a day; also used for mouthwash.

• Tincture of St. John's wort. Prepared in a ratio of 1: 5 in 40 % alcohol. Used as an astringent and anti-inflammatory agent in gastroenterological practice. Inside appoint 40-50 drops 3-4 times a day. For rinsing - 30-40 drops per half glass of water.

• Novoimanin - a water-alcohol preparation made from the herb St. John's wort. It is used externally as a solution for electrophoresis on the liver area.

• Deprim inside for adults 1 tablet 3 times a day for 2-4 weeks.

Rp. Jnf. Herbae Hyperici 2.0-200.0

DS. 70 ml 3 times a day 30 minutes before meals.

Rp. Tincturae Hyperici 50 ml

DS. 40 drops 3 times a day.

Rp. Sol. Novoimanini spirituosae 1 % - 10 ml

DS. For electrophoresis after dilution 10 times with saline in diabetic foot.

Rp. Tabul. Deprimi No. 30

DS. 1 tablet 3 times daily before meals.

Wild strawberry
Fragaria vesca L

A perennial herb of the Rosaceae family 5–20 cm high, with a short brown rhizome and numerous thin roots. Stems are single or several, erect, pubescent, ending in a few-flowered shield. The leaves are trifoliate. Fruits contain salicylic, malic, citric acids, iron, tannins, volatile oils, carotene, vitamins: ascorbic acid, thiamine. The leaves contain organic acids, carotene, ascorbic acid, tannins, glycoside fragarin, flavonoids, traces of alkaloids.

Therapeutic action. Wild strawberry has anti-inflammatory, anthelmintic, diuretic effect, regulates digestion. Due to the high content of nutrients, strawberries are an irreplaceable part of the diet of a patient with diabetes mellitus. Wild strawberry leaves are used in the complex treatment of diabetes mellitus (J. Muszynski, 1956). In Khakassia, strawberry leaves and fruits are used for diabetes mellitus (A.P. Plennik, 1989).

Fruits stimulate appetite, regulate digestion, quench thirst, have the ability to dissolve and remove baked and kidney stones and prevent the formation of new ones. Rhizomes and roots have diuretic and choleretic, anti-inflammatory and astringent properties. The leaves also have a wound healing effect. Fresh and dry steamed leaves, applied to purulent wounds and chronic ulcers, cleanse well of pus and promote healing of the manifestations of a diabetic foot. Berry juice and crushed berries are a good external remedy for eczema, rashes and small wounds.

However, strawberries can be used only in the absence of an allergic reaction.

Application form

• Infusion: infuse 1 teaspoon of chopped strawberry leaves for 4 hours in 1 glass of boiling water, drain. Take 1-2 tablespoons 3-4 times a day.

Umbrella winter lover
Chimaphila umbellate L

An evergreen herb of the wintergreen family that grows from long, lignified underground shoots and reaches 15–25 cm in height. Winter-lover flowers have five wide-opening white-pink petals. Leaves are shiny, green, lanceolate, leathery,

serrated at the edges, 3 to 8 cm in length, collected in one or two whorls at the bottom of the shoots. Dried leaves have only a faint aroma, but when fresh leaves are rubbed, they are very fragrant. The taste is sweetish astringent and with a pleasant bitterness. Blooms in the second half of June, July and early August. You can collect it all summer. Collecting it is very tedious, since the plants are small and practically do not form clumps. It is found throughout the temperate zone in North America, Europe and Asia. Winter-lover grows in coniferous forests, prefers dry sandy soil. The herb contains hydroquinone, chymafilin (2,7-dimethyl-1,4-naphthoquinone), arbutin, flavonoids: quercetin, kaempferol, avicularin, hyperin; resins, starch, pectic acids, chlorophyll tannins, sugar, potash, iron, magnesium, sodium chloride, sulfuric, phosphoric and silicic acids (V.F. Korsun, E.V. Korsun, A.N. Tsitsilin, 2010).

Therapeutic action. Since ancient times, it has been used for medicinal purposes and simply as tea by the indigenous people of North America and Siberia. European settlers in America were quick to appreciate its benefits. To this day, winter-lover is a popular medicinal herb in the United States and Canada. It is included in the official pharmacopoeia of the United States and Germany. We still know little about the winter-lover, and it is mainly popular only in Siberia, especially in Altai, although it also grows in the non-chernozem zone of European Russia. Wintergrass herb is used in traditional medicine as a diuretic. However, a decoction of the aboveground part of the plant, as well as an alcoholic extract, is used in the treatment of patients with diabetes (J. Muszynski, 1956). There is unverified clinical evidence that winter-lover reduces urinary uric acid and helps with diabetes. Herbal tea from the umbrella winter-lover increases appetite, improves digestion, and also reduces blood sugar in diabetes mellitus (Yu. A. Zakharov, V. F. Korsun, 2002).

“Chopping-into-small-pieces” - this is how the name of winter lover is translated from the language of the Cree Indians - pipsisikweu, because the leathery evergreen leaves of winter lover contain a substance that was considered crushing stones in the kidneys. Also, the winter-lover served as a medicine among the Indians in many other cases. The

Mohicans soaked the winter lover in warm water and applied the infusion outside to treat burns. The Thompson Indians in British Columbia ground the winter-lover into powder and apply a wet bandage to relieve swelling in the legs and feet, which can be used to treat diabetic feet. Winterfly leaves are described in the British Herbal Pharmacopoeia and the US Formulary.

Winterfly juice can irritate the skin. You should not use the plant for hemorrhoids, accompanied by constipation, as well as a tendency to thrombus formation.

Application form

• Tincture: 2/3 glasses of dry winter-lover herb pour 0.5 liters of vodka, leave for at least 2 weeks, and preferably a month. Take with diabetic foot, diabetic nephropathy, half a teaspoon in a glass of water 3 times a day before meals.

• Infusion: pour a teaspoon of herbs with a glass of boiling water, cover with a towel, leave for 3 hours. Take a third of a glass 3 times a day for diabetic foot and diabetic nephropathy. With edema, ascites, drink a glass of infusion in the morning, while the infusion is still warm (you can slightly warm it up).

Centaury umbrella

Centaureum umbellatum Gilib

A biennial or annual herb of the gentian family. Stems are simple, glabrous, tetrahedral, solitary, or in groups of two to five. The flowers are bright pink, about 10 cm in diameter, located at approximately the same height. Blooms from July to autumn. Grows in flooded meadows, along river banks, forest glades in the European part of Russia (mainly in the southern and middle zones) and in the Caucasus; less often - in Central

Asia and Altai Territory. For medical purposes, the aerial part of the plant is used, which contains the alkaloid gentianine, flavone glycoside, bitter glycosides, mucus, essential oils, organic acids, and vitamin C (P. A. Kyosev, 2000).

Therapeutic action. The small centaury was known in ancient times. Avicenna wrote the following about him: “It kills intestinal worms and drives urine …” What Ibn Sina said a thousand years ago was fully confirmed by time and formed the basis of indications for the use of centaury small drugs in medical practice.

It has now been established that its bitter glycosides, gentiopicrin, erythaurin, erythrocentaurin, the alkaloids erythricin and gentiamine, and the flavone glycoside centaurein, contained in the herb, cause a multifaceted therapeutic effect of this plant - they induce appetite stimulation and improve digestion with reduced gastrointestinal tract function (M. . Klyuev, E. A. Babayants, 1979).

Preparations from centaury have a choleretic, anti-inflammatory, anthelmintic effect, stimulates the secretion of the digestive glands, increases the acidity of gastric juice, has a mild laxative, blood-purifying, analgesic, antiseptic and sedative effect. The centaury drugs, according to N.G. Kovaleva (1971), have a hypoglycemic effect. They are used for diseases of the liver and biliary tract, pancreatitis, gastritis with low acidity, gas accumulation in the intestines, heartburn, constipation, anemia, diabetes mellitus, helminthic invasion.

The centaury herb is also used as bitterness to stimulate appetite, to increase the secretion of the digestive glands and enhance bile secretion, facilitating digestion and providing a mild laxative effect (A.D. Turova, 1974). It has been experimentally established that gentiopicrin contained in the herb has antihelminthic properties. Unfortunately, plant alkaloids have been little studied.

If you are worried about acidity, pregnancy, then centaury is absolutely contraindicated for you.

Application form

• Infusion of herbs 3 g per 500 ml of water, take 100 ml 3 times a day 20-30 minutes before meals.

• Bitter tincture, 10-20 drops 2-3 times a day 15-20 minutes before meals.

Rp. Inf. herbae Centaurii 2.0-200 ml

DS 1 tablespoon 3 times daily before meals.

Medicinal ginger
Zingiber

A genus of perennial herbaceous plants from the ginger family. Ginger has erect, reed-like, rounded stems, reaching a height of 1–1.5 m. Flower stems are scaly. The leaves are lanceolate, entire, alternate, with a pointed tip. The flowers are orange-yellow or brown, collected in the form of spike-shaped inflorescences. The fruit is a tricuspid capsule. The rhizomes have the appearance of fleshy, roundish, finger-separated pieces and form a fibrous root system. Ginger is native to Western India and Southeast Asia. It does not grow in the wild in nature. It is cultivated in the subtropical and tropical regions of Japan, China, West Africa, Vietnam, Brazil, India, Argentina, Jamaica. Ginger contains a complex of essential amino acids that the human body needs. As you know, amino acids are called irreplaceable, the synthesis of which is impossible in the body and their intake is possible only from the outside, with food. The fibrous mass of the root consists of a large amount (about 70 %) of terpenes - organic compounds, the main components of organic resins. It is their presence that ginger owes its characteristic pungent and pungent taste. In addition, it contains vitamins B1, B2 and C, essential oil, sodium, magnesium, zinc and potassium.

Therapeutic action. Dioscorides, Galen, Ibn Masawaih, Avicenna and many other famous doctors wrote about the medicinal properties of ginger. According to Avicenna, ginger softens and relaxes bloating and improves digestion. Ginger is included in the composition of more than forty complex medicines, such as the famous “Faruk” and “Mithridat” teryaks, developed by famous doctors of antiquity and widely recommended for diseases of the stomach, intestines, liver, etc. According to Muhammad Hussein Sherazi, ginger helps with jaundice, arising from blockages with helminthic diseases.

In one of the ancient Russian medical books of the past, we read: “Little by little ginger is good in the morning, it also encourages food, and drives out any impurity from the stomach.”

Ginger root is used as a spice in cooking, as well as as a remedy in folk medicine. The plant acts as a catalyst for all metabolic processes in the body. Fresh root juice lowers blood sugar levels, and a daily pinch of dried powder helps digestion. In addition, the use of the root regulates fat and cholesterol metabolism in the body, reduces blood clotting. Ginger for diabetes should be used with caution! Specifically, ginger is not recommended to be used in conjunction with anti-sugar agents.

Ginger, one of the most common spices and at the same time an ancient remedy in the countries of the Asian continent, allows you to control high blood sugar levels, which are fraught with complications in diabetics with a long history of the disease. This was stated by scientists at the University of Sydney, writes Medical Xpress. According to study leader Basil Rufogalis, professor of pharmaceutical chemistry, the extracts from Buderim ginger root were able to increase glucose uptake into muscle cells regardless of insulin. Gingerols, the main phenolic components of ginger rhizomes, play an important role in this process.

The specialist, together with his colleagues, studied gingerols-6 and gingerols-8 and found that it was all about their ability to increase the surface of distribution of the GLUT4 protein. When protein is localized on the surface of

muscle cells, glucose easily penetrates into them. B. Rufogalis (1991) notes that in patients with type 2 diabetes, the ability of skeletal muscles to absorb glucose is significantly reduced due to impaired insulin signaling and ineffectiveness of GLUT4. “We hope that the promising results of the study will soon be explored in human clinical trials, ” comment the authors of the work. Earlier, employees of the University of Michigan Medical School found that ginger root can fight inflammatory processes in the colon, therefore it is a good preventive measure against bowel cancer.

Ginger is contraindicated in gastritis, gastric ulcer and duodenal ulcer. Ginger is contraindicated in liver diseases (acute and chronic hepatitis, liver cirrhosis), hemorrhoids, high blood pressure, in stroke, myocardial infarction or pre-stroke and pre-infarction conditions, as well as in ischemic heart disease, body hyperthermia. Allergic processes and individual intolerance are also a contraindication for taking ginger. It is better not to combine ginger with drugs that lower blood pressure, stimulate the heart muscle and antiarrhythmic drugs.

Application form

• Powder (0.3-1.5 g, that is, on the tip of a knife or 1 / 3-1 / 2 teaspoon 2-3 times a day).

• 10 % ginger tincture: pour 20 g of ginger in 200 ml of 40 % alcohol, insist in a dark place for 7 days and filter. Take 15 drops 3 times a day before meals.

• Broth: to prepare the broth, the dry crushed rhizome is boiled for 15 minutes in 0.5 liters of water, infused for 2 hours. After straining, take 100–150 ml 2 times a day.

Catalpa bignoniform

Catalpa bignonioides walt

Catalpa is a tall tree of the Bignonium family with excellent wood. Up to eight species of this genus are known to grow in China, Japan, North America and the West Indies. Flowers with a campanulate two-lobed corolla, white, spotty inside, collected in large brushes or panicles. The fruit is an elongated arrow-shaped capsule up to 40 cm with numerous seeds, at the ends of which there are bundles of soft hairs. Not many people know about this tree, with large oval-triangular leaves and narrow long arrows. Because of these “arrows”, the catalpa is also called the pasta tree, and the large leaves that look like giant ears gave it another name - the elephant tree. There are 11 species, from East Asia and North America. In Russia, in the south of the European part (up to the latitude of Voronezh and Saratov), mainly bignoniform catalpa is cultivated, as well as beautiful catalpa (*C. speciosa*), Bunge catalpa (*C. Bungei*) and ovoid catalpa (*C. ovata*). Catalpa is propagated by seeds, cuttings, root suckers. Grows well on light moist soils; photophilous. Catalpa wood is lightweight, soft, and resists rotting well. Found catalpin and catalposide. The seed oil of catalpa bignonium contains eliostearic acids (about 30 %), dries quickly and hardens in the light.

Therapeutic action. The bark is considered a gastric agent, it has an antihelminthic effect, it is a valuable ingredient in solutions for washing wounds, stimulating the healing of ulcers, fistulas, and reducing cancerous tumors. An extract is prepared from the bark, and the leaves are considered very effective in the treatment of carbuncles, tumors, abscesses, and struma. They are used for corneal opacity, as well as for bronchitis, bronchial asthma and pulmonary emphysema. Cut 10 catalpa pods into 3-4 parts, insist in 0.5 liters of vodka, moonshine or alcohol (40-45 %). It is a good remedy for all types of wounds, acne, herpes, boils and diabetic feet. Inside, take 1 dessert spoon before meals with diabetes mellitus (lowers glucose levels by 5 units per week). Heals hemorrhoids, both internal and external. Cotton wool moistened with tincture is injected into the rectum. In this way, prostatitis is also cured.

Use is undesirable during pregnancy.

Chinese cinnamon (cinnamon)
Cinnamomum cassia

An evergreen small tropical bush tree of the laurel family. The lower leaves are alternate, the upper leaves are opposite, drooping, on short petioles. Leaves are broadly oval, whole-edged, leathery, shiny green on the upper side, with deepened main veins, bluish-green on the lower side, covered with short soft hairs. The flowers are small, collected in paniculate inflorescences, yellowish-white with a simple separate-petalled perianth with six lobes, with two rows of stamens. The ovary is superior. The fruit is a berry. In Ceylon, cinnamon grows wild and on plantations established in the second half of the 18th century. Today it is grown in India, Indonesia, Malaysia, Brazil, Guiana, Martinique, Reunion.

Cinnamon is the dried bark of the branches of cinnamon trees that is used as a spice. Cinnamon contains 1–2 % of essential oils consisting of cinnamaldehyde cinnamaldehyde - the main active principle, eugenol, as well as tannins and resin (VI Farmazyuk, 2003).

Therapeutic action. Already in the 1st century A.D. e. Pliny the Elder wrote about the taste of cinnamon and distinguished several of its types. In many countries, cinnamon is included in the state pharmacopoeia. Cinnamon is valuable not only as a spice, but also promotes an increase in appetite, improved digestion, normalization of the stomach and intestines, activates the kidneys, liver, gall bladder. Experts from Malmö University Hospital (Sweden) have found that a pinch of cinnamon daily can control blood sugar levels. The results of the scientists' research are published in the American Journal of Clinical Nutrition (www.vokrugsveta.ru). The experiment involved fourteen healthy volunteers. For several days, they were given rice pudding, sometimes with

cinnamon added to it. Participants measured their blood sugar levels before meals and two hours after dessert.

In the end, it was found that the amount of blood sugar when consuming cinnamon pudding was significantly reduced compared to plain rice pudding. Previous research has shown that cinnamon makes the disease easier for people with diabetes II (non-insulin dependent diabetes, which develops mainly in old age). After adding cinnamon to their food for 40 days, their blood sugar and cholesterol levels began to drop. On the other hand, it was later shown that cinnamon does nothing to help people with type 1 diabetes. In addition, some scientists have questioned its efficacy for type 2 diabetes.

Nutritional value. Cinnamon is added as a spice to cookies, muffins, cakes, gingerbread cookies, sweet pies with fruit fillings, as well as sweet pilaf, compotes, jams, mousses, jellies and curd spreads.

You can not take cinnamon for individual intolerance, in large quantities for various internal bleeding, as well as during pregnancy, as this seasoning promotes increased contraction of the uterus.

Sowing hemp
Cannabis sativa L

A dioecious annual herb of the hemp family. It often runs wild and is found in garbage places, fallow lands and as a weed in breads and in gardens. Stem 60–200 cm tall, covered with adpressed hairs, branched. Leaves 3–7-partite with long petioles, lobes lanceolate, large-serrate, on long petioles, hairy. Blooms and bears fruit in June - July. Grows in the Volga region, Western Siberia, Altai. It is cultivated in the middle and southern zone of the European part of Russia. In medical practice, mature hemp fruits are used. The fruits contain a lot of fatty oil, protein and mucous substances, glycosides,

phytoncides, vitamin K, resin, traces of alkaloids and steroid saponins. Fatty oil, resin, vitamin K, choline, cholesterol, sugars, edestine, saponins, alkaloids, essential oil, carotene, cannabidiolic acid, tetrahydrocannabinol, delta-9-tetrahydrocannabinol.

Therapeutic action. In the domestic medicine of the pre-revolutionary period, the officinal extract and tinctures of the herb of Indian hemp were used as an analgesic, sedative and mild hypnotic. A decoction of flowers and seeds of cannabis cannabis lowers blood sugar levels (J. Muszynski, 1956).

Common mullein (scepter)
Verbascum Thapsus L

A biennial herbaceous plant of the Scavenger family, 50–150 cm high, with an erect stem. Leaves are alternate, large, oblong-elliptical, soft pubescent. The flowers are light yellow, collected in a dense spike-shaped inflorescence. The corolla of the flowers is drooping, tubular-funnel-shaped, with five stamens adherent to it. Blooms in July - August. It grows along the edges of forests, forest glades, glades and bushes, ravines and river banks in the southern and central regions of Russia. Harvest the grass during flowering; roots - in autumn, after the first year of plant life. Found triterpene saponins, iridoids, mucus, resins, gum, coumarin, carotene, flavonoids, ascorbic acid, tannins, sugars, essential oil, dye alpha-crocetin (V.F.Korsun et al., (V.F.Korsun , E. V. Korsun, A. N. Tsitsilin, 2010).

Therapeutic action. Mullein was known as a medicinal plant in the Middle Ages. Flowers, leaves and roots of mullein are widely used in traditional medicine in various countries.

Flowers and leaves have an expectorant, emollient, enveloping, anti-inflammatory, analgesic and wound healing effect. Flowers also have an anticonvulsant effect. In traditional medicine, the plant is used for inflammatory

processes of the upper respiratory tract. The flowers and leaves of the mullein are part of the antidiabetic collection (J. Muszynski, 1956).

The plant is poisonous, especially the seeds. In this regard, the preparation of medicines at home requires special care; it is not recommended to use seeds: strictly adhere to dosages; store raw materials separately from other plants.

Application form

• Infusion: 1 tablespoon of dried mullein flowers per 400 ml of boiling water, infuse for 4 hours, filter. Take 100 ml 2-3 times a day for diabetes.

Nettle (deaf)

Lamium album L

Perennial herb of the family *Labiatae,* reaching 30–80 cm in height, with a long creeping rhizome. Popular names: nettle deaf, white nettle, cuckoo nettle. White lamb is widespread in the temperate zone of the Northern Hemisphere: Minor, Western and Central Asia, Transcaucasia, Mongolia, China, Japan, Korea, northern Hindustan, almost all of Europe. In Russia, it is found very often in the European part, in the North Caucasus, in Siberia and in the Far East. Prefers shaded places with sufficient moisture along the banks of ravines, where it forms dense, low thickets. Grows in gardens, vegetable gardens, fences and outbuildings, less often in shrubs and forests. Flowers and leaves of dead nettle contain mucus, tannins, saponins, alkaloids, flavanoids, essential oil, ascorbic acid (V.F.Korsun, V.K.Viktorov, 2010).

Therapeutic action. Used for inflammatory diseases of the respiratory tract, as a hemostatic agent, as well as for diabetes mellitus. Leaves, fresh juice, lettuce from the upper

young shoots and nettle flowers reduce blood sugar. The use of nettle for the treatment of wounds is due not only to the content of vitamin K in it, but also to the presence of pure chlorophyll, which has a strong stimulating and tonic effect, but most importantly, it promotes the healing of affected tissues in diabetic foot syndrome. In general, chlorophyll improves metabolism, increases the tone of the intestines, uterus, cardiovascular system and respiratory center. Chlorophyll isolated from nettle is widely used in radiation therapy. The presence of an iron-protein complex in nettle, fortified with vitamins, allows the plant to be used in the fight against secondary anemia in diabetes, as it increases the content of hemoglobin and red blood cells in the blood and has a beneficial effect on carbohydrate metabolism. This is very important for the body weakened by diseases. The use of infusions and decoctions of nettle leaf allows you to accelerate the recovery of postoperative, wounded and burn patients. Avicenna also recommended cleaning and healing wounds with chopped nettle leaves mixed with vinegar.

It is undesirable to use deaf nettle with increased blood clotting, atonic colitis, hypotension and pregnancy.

Application form

• For internal use, the leaf infusion is prepared at the rate of 1:20. It is kept in a boiling water bath for 15 minutes, insisted for 40–50 minutes and 150 ml is drunk 4–5 times a day.

Stinging nettle
Urtica dioica L

Perennial herbaceous weed plant. For medicinal purposes, leaves are used that contain tannins and protein

substances, formic acid, urticin glycoside, vitamin K and ascorbic acid, pantothenic acid, carotenoids, chlorophyll, sitosterol, histamine, violaxanthin, iron salts and wax.

Therapeutic action. This is a well-known and widely used medicinal plant since ancient times (Pliny the Elder, Ibn Sina). Even Dioscorides fed with liquid barley gruel with nettle to weakened patients with atony and hypovitaminosis. The fact that nettle has been used by man since ancient times is undoubtedly. Dioscorides, for example, pointed out that nettle was widely used by the ancients as a medicinal plant with amazing properties against many ailments. Avicenna recommended the use of nettle for the treatment of some organs of the head. He writes that crushed nettle leaves stop nosebleeds, “and nettle seed helps with loss of smell and forcefully opens up blockages in the ethmoid bone. Nettle seed in the form of a medicated dressing makes tooth extraction easier; application of a medicated dressing made from nettle seed helps against swelling behind the ears and inside the glands.

Avicenna also used nettle for the treatment of the respiratory and chest organs. “When nettles are given to drink in barley water, they cleanse the chest. Or, nettle leaves are boiled in barley water, and then they remove the thick juices in the chest. The nettle seed works more strongly: it eliminates asthma, standing breathing and cold pleurisy.

Avicenna noted the special healing and health-improving capabilities of nettle in the genitourinary sphere. He recommended taking nettle seeds mixed with grape must for those women who cannot get pregnant. For the same purpose, Avicenna advised such women to eat nettles with onions and eggs or drink a decoction of nettles with myrrh. He also recommended that women make medicated dressings from fresh nettle leaves in the urogenital area.

Pointing to the laxative properties of nettle, Avicenna noted that nettle oil was especially good at relaxing. For constipation, he recommended rubbing the soft parts of the nettle with oatmeal, stirring this mixture and drinking. To

improve stool and against hemorrhoids, he advised candles made from a mixture of nettle and honey.

An old medical book says: “If someone’s stomach is hard, you need to steam up nettles in wine, cool this broth and drink it to your health, it will help.” Medicines based on stinging nettle have long been used in the treatment of a number of diseases of the gastrointestinal tract - stomach and duodenal ulcers, gastritis, motility disorders and gastric acid production. So, to reduce the activity of hydrochloric acid and pepsin, a decoction of nettle with honey is used.

Nettle contains secretin, which normalizes metabolism, stimulates the formation of insulin and thereby leads to a decrease in the amount of sugar in the blood, which is certainly necessary for people with diabetes (V.F. Korsun, V.K. Viktorov, 2010). Known choleretic and diuretic properties of nettle, which makes it possible to use it in diseases of the liver, kidneys (diabetic nephropathy), gall bladder and gastrointestinal tract.

An infusion of leaves and flowers of nettle deaf is used internally for diabetes (J. Muszynski, 1956). Leaves, fresh juice, salad from the upper young shoots of stinging nettle reduce blood sugar (J. Muszynski, 1956; L. D. Shulyat’eva, 1964). An aqueous infusion of the aerial part of stinging nettle, a decoction and a liquid alcoholic extract from it are used in the treatment of patients with diabetes (NG Kovaleva, 1971).

The plant contains a complex of vitamins B and K, which have a hemostatic, diuretic, anti-inflammatory, secretolytic effect. The hemostatic effect of nettle preparations is due to the presence of vitamin K in it, which takes part in the formation of prothrombin, participates in the processes of tissue respiration, has a wound-healing and antimutagenic effect. It is used especially in combination with protein for hypovitaminosis, internal bleeding, diabetes mellitus, chronic diseases of the kidneys, bladder, liver and biliary tract.

Especially necessary is the use of nettle for people suffering from diabetes. Nettle normalizes natural metabolism, tissue metabolism, and thus leads to a decrease in the amount of sugar in the blood. There is evidence that eating nettle helps

to restore the functions of the beta cells of the pancreas, as a result of which insulin dependence in diabetic patients sharply decreases until normal sugar metabolism is fully restored. In addition, the presence of secretin in the nettle, which stimulates the formation of insulin, is also antidiabetic, helping to remove sugar from the blood. The recipe for the collection of plants recommended by S.E. Musina et al. For diabetics (2000) necessarily contain nettles. Consequently, nettle is the main component of antidiabetic action, although more than forty such plants are known.

GN Chukanova (2007) investigated the antidiabetic properties of a new oil extract from nettle leaves in an experiment. In rats that received an oil extract from nettle leaves, a decrease in deaths was noted in comparison with diabetic control by 31 %. The blood glucose content in animals treated with the phytopreparation was significantly lower than the level of the control group on the 7th day by 21.3 %, and on the 30th day - by 39.1 %. It has been confirmed that the oil extract from nettle leaves has an antioxidant and anti-inflammatory (antiexudative) effect, which allows it to be recommended for the complex treatment of patients with mild to moderate diabetes mellitus.

Chlorophyll, when taken orally, improves metabolism. The combination of nettle extract with liquid yarrow extract increases blood clotting, nettle helps to increase the hemoglobin content in the blood and increase the number of red blood cells.

Nettle is used for cancer, especially during radiation and chemotherapy, diseases of the liver, gallbladder, inflammatory processes of the gastrointestinal tract, anemia, dyspepsia, stomach ulcers, hemorrhoids, diabetes mellitus, epilepsy, chronic bronchitis, etc.

Food use. Young nettle leaves are an early and valuable vitamin product. They go to make salads, soups, cabbage soup, as seasonings. For this, it is recommended to widely use nettle leaf powder, adding it to sauces, soups, cereals, pancakes and omelets. Put the nettle last in order to preserve the healing properties of this “burning healer”.

In addition to lyophilized nettle and nettle powder in tablets, Biorhythm produces combined nettle tablets with dry cabbage and beet juices. Their effectiveness increases sharply due to the combined effect of a complex of substances contained in beets, cabbage, nettles. In tablets of nettle with cabbage and beet juices, the antiulcer effect of vitamin U and the general healing effect on the human body are enhanced.

Application form

• Infusion (3 g per 200 ml of boiling water) for oral administration, 50–70 ml 3-4 times a day.

• Liquid nettle extract is prescribed 25-30 drops 3 times a day 30 minutes before meals.

Watercress (drugstore watercress) Nasturtium officinalis L

Perennial herb of the cruciferous family with creeping stems up to 50-60 cm in length. Its green leaves are oval and attached to the twigs in pairs. The plant blooms with white small flowers, collected in half-umbrellas. After flowering, it forms a pod-fruit with oblong seeds. Raw green leaves are used as a spice. In Russia, it grows in the southern regions, as well as in the North Caucasus, in Central Asia. It takes root in damp places, swamps, ditches. It is cultivated in Western Europe, England, France, USA. The plant is rich in many substances: iron, phosphorus, potassium, nitrogenous oils, vitamins A, B, C, E, K; contains a glycoside.

Therapeutic action. Due to its properties, watercress is widely used in medical practice, it is prescribed for improper metabolism, for cleansing and improving the condition of the blood, as an expectorant and diuretic, for fever and scurvy. In folk medicine, it is used for nervous diseases. Due to the fact that the plant is rich in minerals and vitamins, but at the same time low in calories (there are almost no sugars), watercress is

useful for obesity and diabetes. It is recommended to use it as food, as well as drink freshly prepared juices, especially for persons suffering from diabetes mellitus (J. Muszynski, 1956).

Fresh herbs are used like other leafy vegetables. Finely chopped, it is used only fresh, with cottage cheese, with white cheeses and for making soups, omelets. It is used to decorate dishes with cold meats, for sauces, vegetable salads, in combination with tomatoes, as an appetizer, for fried potatoes, for egg dishes.

During pregnancy or breastfeeding, watercress is contraindicated.

Application form

• Watercress extract in the form of a cream externally for diabetic feet.

Pharmacy bought (medicinal)

Polygonatum officinalis L

Perennial herb of the lily family. The flowers are solitary, small, white, drooping, with a spherical-bell-shaped, accrete six-toothed perianth. Blooms in May - June. The plant is poisonous! The fruit is a bluish black berry. Leaves are alternate, oval-lanceolate, stalk-embracing, glabrous or shortly pubescent, facing one side of the stem. Perennial herb 20–45 cm high, with a thick, knobby, horizontal rhizome bearing a stem. It grows in birch and coniferous forests, bushes, on the slopes in the European part of Russia and Siberia. Harvest the grass during the flowering period; rhizomes - in late autumn. Contains saponins of a steroid nature, lectins, cardiac glycosides (konvallyarin, konvallyamarin), mucus-like and tannins, acids (chelidonic and ascorbic), asparagine, glucose, arabinose, mannitol, carotene (A.D. Turova, 1976).

Therapeutic action. In the old days, herbalists, healers called this plant the Solomon seal, since the preparations from the plant help those who have intervertebral hernia, stomach ulcers or diabetes mellitus. According to legend, this is the seal of the wise king Solomon. Having lived a very long life himself, he allegedly marked with a seal a plant that can prolong human life. It has analgesic, antipyretic, anti-inflammatory, wound healing, hemostatic, blood-purifying, enveloping, emollient, expectorant and emetic (in case of overdose) action. As a result of experiments, the hypoglycemic property of kupena rhizomes was revealed (however, it is not manifested in all types of hyperglycemia). The tonic effect on the central nervous system, the ability to increase blood clotting, as well as cardiotonic activity were noted (B. Pecke, 1953). A decoction and tincture of plant roots are recommended for insulin-dependent diabetes mellitus, as well as for the prevention of diabetic angiopathy of the lower extremities.

The plant is poisonous. Roots, grass, flowers and berries are emetic. Stick to the indicated doses and do not exceed them! An increase in the dose of a drug does not at all mean an increase in its effectiveness! Kupena is contraindicated in pregnancy.

Application form

• Tincture of 100 g of fresh grass bought for 100 ml of 70 % alcohol is insisted for 10 days, filtered. Take 10-15 drops 2 times a day for diabetes. A decoction is also used, but under the supervision of a doctor.

Long turmeric

Curcuma domestica, longa

A spicy-aromatic plant of the ginger family, and the spice prepared from its rhizome belongs to the category of classic ones. It is a perennial plant, reaching a meter in height, with large oval leaves growing directly from the rhizome, from light to dark green. In appearance, it resembles a reed. After special treatment, the roots-tubers of this plant are used as a spice with a strong aroma. The rhizome is also a strong orange-yellow dye. Southeast India is considered her homeland, where the largest amount of this spice is grown and consumed. Turmeric contains aromatic essential oil and curcumin dye. The rhizome is rich in other useful substances:

α-fellandrene, zingeberone, borneol, sabinene, β-curcumin (V.I. Formazyuk, 2003).

Therapeutic action. In Ayurveda from herbs of general action, the work of the pancreas and liver is best regulated by turmeric, which is especially useful in the early stages of diabetes (L. Miller, 2010). In diabetes, many oxidative processes develop that release harmful tissue derivatives, glycolysis products, which are formed in various tissues. Turmeric has been proven to prevent the induction of glycolysis products. This allows turmeric to be considered a drug for the prevention and treatment of diabetes and some of its complications. Turmeric has been shown to reduce kidney damage that develops in diabetics. The hypoglycemic effect of turmeric has been revealed. Take it in the form of a powder (1-3 g 2-3 times a day) with aloe juice. In Indian folk medicine, turmeric is considered an antibacterial agent. It is prescribed for weakened patients. Turmeric is also used in the treatment of diabetes mellitus, anemia, and poor circulation. Turmeric has a hypoglycemic effect by blocking the pancreatic amylase enzyme and stimulating insulin secretion by Langerhans cells.

Nutritional value. The coloring matter curcumin, contained in turmeric, dissolves in fats, therefore in the food industry it is used to color oils, margarine, cheeses, sugary drinks, liqueurs. Turmeric is found in the famous Indian curry mixture. She is a good seasoning for omelets, hard-boiled eggs, light sauces, soups and vegetable salads. It is part of Bittner’s original large balm.

In the presence of chronic diseases (especially calculous cholecystitis) when using strong spices, it is worth asking the advice of a doctor or nutritionist. Do not use in combination with preparations containing iodine or iron.

Laurel noble
Laurus nobilis L

An evergreen shrub from the laurel family. It grows both in culture and wild throughout the Mediterranean, in the subtropics of Russia. At the end of April, Laurel noble blooms with whitish flowers, forming bushes of false umbrellas or short panicles. The leaves, especially used as a condiment, are harvested young, but still fully developed and dried. The fruits are harvested in a state of full ripeness. Fresh fruits and leaves are used to obtain fatty laurel oil by steam distillation, which is mainly used in medicine. The seeds contain up to 72 % essential oil. There is much less essential oil in the leaves (up to 2–3.5 %). It includes almost 50 % cineole and about 65 more components, including rutin (V.I. Formazyuk, 2003).

Therapeutic action. The laurel is dedicated to the son of Zeus Apollo - a symbol of glory, victory and peace. The tough leaves of a laurel wreath covered the heads of the winners of sports, music and poetry. This is a cult tree, it is primarily associated with Ancient Greece, with the mythological image of the ancient god Apollo, which is a symbol of male beauty. The famous Ovid in his “Metamorphoses” narrates that Apollo, who lived among people, fell in love with the nymph Daphne and constantly pursued her. Once, after defeating the serpent Python, Apollo met the young god of love Eros with a bow and arrow and made fun of him: “Why do you, baby, bow and arrows? Do you think you will surpass me in the art of shooting? ” This mockery offended Eros, and he sent two arrows in revenge.

The first, the arrow of love, pierced Apollo, and the second - killing love - hit Daphne. It is curious that in Russia until the 18th century, the bay leaf was called “daphnia” (“laurel” in Greek means “daphne.” The laurel came to Russia 25 centuries ago. The Greeks brought it to Crimea along with figs, cypress, olive and grapes It still grows in countries with a coastal climate: Greece, Turkey, Albania, Slovakia, France, Spain, Portugal, Guatemala, Crimea, the Black Sea coast.Italy grows and exports this spice more than others.

The plant oil has anti-inflammatory, expectorant, hyposensitizing, immunomodulatory, carcinoprotective, anti-spastic, antiviral, antiseptic effect, enhances blood circulation. It has a fairly high bactericidal activity: it causes a growth retardation of Staphylococcus aureus, Pseudomonas aeruginosa, Proteus vulgaris at a dose of 0.05-0.025 g / ml. The fungicidal activity of the oil is manifested at a dose of 400 μg / ml, bactericidal activity against mycoplasma of pneumonia and the L-form of streptococcus at a dose of 400 μg / ml. The volatile secretions of laurel inhibit the development of mycobacterium tuberculosis (V.V. Nikolaevsky, 2002).

Laurel oil preparations stimulate immunological reactivity, mainly the T-system of immunity: they normalize the content of immunoregulatory cells, increasing the initially lowered T-helpers, decreasing the initially elevated T-suppressors, increasing the IgM content in the blood, reducing the increased level of immune complexes, and normalizing the coefficient of the immune response.

Bay oil is indicated for acute lingering pneumonia, chronic bronchitis, pulmonary tuberculosis, immunodeficiency, for the prevention of acute respiratory infections and influenza, as well as adaptation to new climatic conditions. Laurel is used to treat diabetes. With an increase in blood sugar, traditional medicine recommends brewing 5 laurel leaves with one glass of boiling water, insist in a small thermos for 24 hours and drink 3 times a day half an hour before meals. This course should be carried out for 2-3 weeks.

As a component, laurel oil is a part of external medicines used for rheumatism, paralysis, colds, diabetic foot, etc. Laurel is used in unofficial medicine to treat spastic pain in diabetes mellitus.

Nutritional value. It is widely used as a spice. Bay leaves are often used in the preparation of sauces for fried potatoes, stewed potatoes, vegetable soups, fish marinades, when pickling white and red cabbage, canning cucumbers, pumpkins and beets. Bay leaves provide a flavor that is almost always appropriate.

The use of bay oil, fruits and leaves as a condiment sometimes causes allergies.

Application form

• Laurel oil in a dose of 1-2 drops per 30 ml of oil - the basis for phytomassage, phytoaromatherapy.

Lasovan medicinal

Vence toxicum officinale Moench

Perennial herb of the Grimaceae family. From a branched rhizome with many thin whitish roots, several straight, rounded, rod-shaped stems about 75 cm in height depart . Leaves are opposite, yellowish flowers are collected in false umbrellas. Fruits are relatively large leaflets that open when ripe and contain numerous ovoid, flattened seeds covered with silky hairs. Blooms from May to August. It is usually found in sunny places, in light shrubs and hedges, in wastelands, in forests, as well as on damp, nutrient-rich soils. The rhizome of the gullet is harvested, which contain flavone glycosides, which determine some similarity in action with digitalis; sitosterols, alkaloids (V.P. Makhlayuk, 1993).

Therapeutic action. The rhizome is widely used in folk medicine, and lately, drugs are being made from it in scientific medicine. It has been proven that the infusion and decoction of leaves and seeds of the raspberry are used to treat patients with diabetes (N.A. Outwardly, the infusion of the roots or leaves of the raspberry is used for washing and lotions for various wounds and ulcers. Chopped fresh leaves are applied to wounds and other manifestations of the diabetic foot. The roots of the plant are used as part of homeopathic preparations for diabetes.

The slightest overdose leads to poisoning. It begins with salivation, dizziness, vomiting, diarrhea, and leads to seizures and then paralysis of the heart muscle.

Application form

• Broth: 5.0-200.0; take a tablespoon three times a day.

Sowing lettuce (vegetable salad)

Latuca sativa L

Herbaceous plant of the Compositae family. Garden salad comes from a wild-growing salad found in Europe, Asia, North Africa, and adventively in North America. They began to cultivate it in the Mediterranean countries at the dawn of civilization: in Ancient Egypt, Greece, Rome, Byzantium. In Europe, it began to be cultivated from the middle of the 16th century, in Russia - from the 17th century. Nowadays lettuce is grown in almost all countries of the world. Its leaves contain carotene, ascorbic acid, tocopherol acetate, glycokinins (lectins). Milky juice of lettuce contains malic, oxalic and citric acids, succinic acid, as well as mannitol, asparagine, lactucin, iodine, calcium, potassium, magnesium, phosphorus and iron salts. The salad is rich in mineral salts of potassium,

calcium, iron, phosphorus and others, very valuable for the body. It also contains many trace elements - aluminum, copper, barium, titanium, strontium, chromium, bromine, bismuth, nickel, zinc, uranium and a number of others (V.I. Formazyuk, 2003).

Therapeutic action. Salad is a valuable dietary and medicinal plant, extremely useful for adults and children with diabetes. Sowing lettuce is indicated for mild forms of diabetes, since the nicotinic acid contained in it activates the action of insulin. Due to the presence of glycokinins in lettuce, it can be used in the treatment of patients with diabetes (B. Pecke, 1953; D. Shukurova, 1981). Due to the favorable ratio of potassium and sodium, lettuce has a regulating effect on the water balance in the human body: it removes excess water in case of cardiac edema, lowers blood pressure.

Salad is not recommended for people who have elevated levels of oxalic acid in their urine.

Application form

• Infusion: 1 tablespoon of leaves in a glass of boiling water, insist 1-2 hours and drink half a glass 2 times a day or a glass at night.

Leuzea safflower (maral root, raponticum)

Rhaponticum carthamoides Willd

Perennial herb of the Asteraceae family. One of the main sources of such funds is Leuzea, or *Leuzea - Rhaponticum carthamoides* (raponticum, or maral root), a rare endemic plant that grows in the highlands of Siberia, Central Asia, Mongolia and China, at an altitude of 3000 m above sea level.

In the course of a long evolution, confined to the genesis of mountain systems, in extreme living conditions, on the basis of ancient vegetation on the edges of glaciers, relics of the Pleistocene floristic complex became the owners of a special form of metabolism, in which the specificity of the secondary metabolism is accompanied by the biosynthesis of phytoecdysteroids. Leuzea concentrates very high levels of ecdysteroids along the entire vertical profile (inflorescences, leaves, rhizomes, and roots), 10–100 thousand times higher than their content in other ecdysteroid-containing species (NP Timofeev, 2005).

Therapeutic action. In the X-XI centuries the plant was planted in the pharmaceutical gardens of the first botanists-introductors. Russian settlers in the 16th-17th centuries in Altai had a belief about the miraculous power of this plant, which heals from fourteen ailments and restores youth. According to legend, among the local peoples of Transbaikalia, the power of the leuzea grass is such that after using it, a warrior can pull out a tree with just one touch of his hand. If a 90-year-old man takes a decoction of the herb, his sexual power is restored, and he can marry a 16-year-old girl. Based on folk legends, highly active grass can be found in the nest of the haratanshol bird, which brings it from the mountains, or you need to get it from the mouth of a maral deer killed by hunters. Among the natives of Siberia and Mongolia, the plant was known as the “strong root”, helping to live up to 100 years in high physical, sexual and spiritual strength.

S. A. Saratikov et al. (1962) found that leuzea significantly affects glycemia in experimental animals. Under the influence of leuzea, the content of glycogen and lactic acid in skeletal muscles increases during exercise, with a constant level of glycogen in the liver (BA Kurnakov, 1960).

Leuzea contains a set of unique natural substances: ecdysterone, anti-stress proteins, peptides, vitamins. It is with the high content of ecdysterone that the antidiabetic properties of leuzea are associated. Ecdysterone helps to lower blood glucose levels without changing insulin levels. This has a pronounced effect in the treatment of type 2 diabetes. With

prolonged use of ecdysterone, blood circulation gradually improves, heart rate normalizes, and the physiological capabilities of the heart muscle increase. In the blood, the content of erythrocytes, leukocytes and other blood cells, hemoglobin increases. Ecdysterone has antioxidant properties. The search by scientists for the elixir of life for many years in Tibet and the Himalayas led to the discovery of ecdysterone, which is one of the constituent components of the so-called elixir of eternal life.

In recent years, aerial parts of *Rhaponticum carthamoides* plants have been used instead of rhizomes to extract ecdysteroids . Currently, a new class of ecdysteroid-containing pharmaceuticals from the whole medicinal raw material *Rhaponticum carthamoides is* being developed , characterized primarily by a wide range of active substances and high biological activity at low doses (with the participation of Genesis Group, Fitostar). The successes achieved in the development of industrial cultivation technology have opened the possibility of designing and launching on the commercial market a new class of highly active pharmaceuticals and biologically active food additives (N.P. Timofeev, 2000; 2004).

Contraindications: epilepsy, hyperkinesis, hypertension, hyperexcitability, insomnia. Side effects: in some cases, there may be excitement, insomnia, headache, sometimes hypertension (in these cases, the drug is canceled or the dose is reduced).

Application form

• A decoction of Leuzea root is drunk with diabetes. 1 tablespoon of raw materials in 1 glass of water, simmer over low heat for two hours, strain. Drink 1 tablespoon 3 times daily before meals.

• BAA “Bifunzin”, BCL-Fito; Rapontik, FITO-GURU, etc.

• Tincture of Leuzea rhizomes (25 g of raw materials per 0.5 l of 40 % alcohol), 20-30 drops, 2 times a day, 20 minutes before meals for 2-3 weeks.

• Leuzea tablets 20 mg 2 times a day.

• “Sayany” tonic drink.

• Liquid extract 20 drops in the morning and afternoon.

Flax ordinary
Linum usitatissimum L

An annual herb of the flax family. It is cultivated as a fibrous and oil-bearing plant in the northern and middle zones of the European part of the CIS and in Siberia. It is cultivated in the fields. For medical purposes, seeds are used that contain up to 48 % fatty oil, up to 26 % carbohydrates, up to 12 % mucus, linamarin glycoside, vitamin A, organic and unsaturated fatty acids.

Therapeutic action. Flax seeds with hot water produce thick mucus that forms from the outer layer of cells when they swell. Mucus has a mild laxative, enveloping, emollient, anti-inflammatory, analgesic, wound-healing, anti-sclerotic effect. Glucoside linamarin formed in mucus regulates the secretory and motor functions of the digestive tract. A decoction of flax seeds is recommended for stomach and duodenal ulcers, bronchitis, cystitis, pyelonephritis, and as a gentle laxative. The use of flaxseed oil lowers cholesterol and increases the concentration of phospholipids in the blood, since vegetable oil binds bile acids in the body (V.I. Formazyuk, 2003).

V.G. Voronin and P. Kasumova (1968), studying the antidiabetic properties of flaxseed and its effect on the state of the endocrine apparatus of the pancreas, found that in the latent form of alloxan diabetes, the therapeutic effect of the plant does not manifest itself, and when it is affected, it significantly reduces the sugar content in blood. When using flaxseed, the authors also found the stimulation of the growth

of poorly differentiated cells and the development of new pancreatic islets and the proliferation of beta cells of the gland.

External linseed oil mixed with lime water is an excellent anti-burn agent. Crushed seeds, brewed with boiling water, are used in the form of phytoapplications for renal and hepatic pains, radiculitis, boils, trophic ulcers and diabetic foot.

Nutritional value. Flaxseed oil is prescribed as a component of dietary food for patients with hypertension, diabetes mellitus, cirrhosis of the liver, hepatitis, fatty liver disease, etc.

It is impossible to use flaxseed oil for cholelithiasis and pancreatitis, for peptic ulcer in the acute stage, for stomach and duodenal ulcers, for ulcerative colitis, irritable bowel syndrome.

Application form

• Flaxseed oil 1 teaspoon 2 times a day.

• Linetol - a mixture of ethyl esters of unsaturated fatty acids from linseed oil for external use in case of burns.

Small-leaved linden

Tilia parvifolia L

A tree of the linden family up to 28 m high with a slender trunk. The leaves of the linden cordate are alternate, with petioles up to 8 cm long and a cordate plate up to 9 cm in diameter, finely toothed along the edge, with a retracted-pointed apex. The flowers of the plant are heart-shaped, yellowish-white, odorous, up to 1 cm in diameter, collected in corymbose inflorescences with an oblong light yellow bracts 3–7 cm long and 1.5 cm wide. The fruits of the tree are heart-

shaped, round, felt-pubescent nuts up to 8 mm in diameter. The heart-shaped linden blooms in June - July, the fruits ripen in August - September. Linden is widespread in the European part of the CIS, in the Crimea and the North Caucasus, in the Transcaucasus, in the South Urals (in Bashkiria, Tatarstan), in Western Siberia. Inflorescences with bracts - “linden blossom”, contain essential oil (0.05 %), in its composition farnesol; flavonoids: kaempferol, acacetin, afzelin, kaempferitrin, tiliroside, quercetin, tilianin, hesperidin, biosides of kaempferol, quercetin, herbacetin, protoanthocyanidins; tannins; saponins; phenol carboxylic acids; vitamin C; polysaccharides. Heart-shaped linden in inflorescences contains: ash - 6.16, macroelements (mg /): K - 23.60, Ca - 16.90, Mg - 3.00, Fe - 0.20; trace elements (μg / g): Mn - 207.00, Cu - 8.63, Zn - 29.00, Co - 0.48, Mo - 0.64, Cr - 0.56, A1–115.40, Se - 0.13, Ni - 2.16, Sr - 25.50, Pb - 2.96, B - 59.60, I - 0.06. Concentrates Mn, Sr. The cordate linden can accumulate Mn (M. Ya. Lovkova et al., 2013).

Therapeutic action. Flavonoids have a strong diaphoretic, diuretic, anticonvulsant, anti-inflammatory, antihypoxic, analgesic and ability to dissolve thick phlegm and mucous secretions. Linden preparations are used for colds, pneumonia, epilepsy, etc. Infusion in experimental alloxan diabetes has a hypoglycemic (sugar-reducing) effect; in severe alloxan diabetes: the infusion increases the survival rate of rats (http://www.greeninfo.ru). In the collection (infusion), linden flowers are added in the treatment of metabolic and hormonal disorders in the body, in particular in diabetes mellitus, especially type 2. Linden flowers are used in traditional medicine as part of antidiabetic tea (J. Muszynski, 1956). For the treatment of skin lesions, ulcers, wounds, joint pain in diabetes mellitus, a concentrated infusion of linden inflorescences is used (V.G. Pashinsky, 1999). To prepare it, you need to take 50 g of linden flowers, pour them with 1 glass of boiling water and teach for 1 hour. This infusion is used for external use, lotions, poultices, trays, etc.

It is not recommended to use linden blossom infusions and decoctions for people with heart diseases, with a tendency to allergic reactions. With prolonged use of drugs from linden (tea), several months or more, visual acuity may sharply decrease. You can't drink linden tea all the time.

Application form

• Linden flowers are used both by themselves and in mixtures: linden flowers - 5 g, mullein flowers - 2 g and black elderberry flowers - 3 g per 0.5 l of boiling water, leave for 30 minutes, strain and drink warm in throughout the day.

Six-petalled clematis
Clematis hexapetala Poll

A perennial plant of the buttercup family, about 1 m high, stems are straight, short pubescent at the top. The leaves are pinnate, the flowers are white or yellowish with apical paniculate inflorescences. Blooms in summer - June - July. In Russia, they grow in Primorye and Amur Region. Plants contain anemonol, clematitol, saponins. Anemonol polymerizes into anemonin and loses volatile phytoncides. Plants also contain flavonoids, coumarins, carotene, phytosterols, resins, sugars, organic acid salts, and traces of alkaloids. In fresh leaves of Manchurian clematis, 190 mg% of flavonoids and more than 100 mg% of vitamin C were found. Four glycosides were isolated from plants - clematosides, the aglycone of which is oleanolic acid (V. A. Dorovskikh, V. K. Lifar, 1971).

Therapeutic action. Clematis preparations have a hypoglycemic effect on rats with alimentary hyperglycemia and alloxan diabetes (LD Shulyat'eva, 1965). She, in experiments on rats, established the hypoglycemic effect of six-lobed clematis. If this is established in a clinic, then it can be used in the treatment of patients with diabetes mellitus.

Pharmacologists of the Blagoveshchensk Medical Institute investigated kokoryshelistny clematis (heraclite) and found that its use increases the body's resistance to the action of a number of extreme stimuli (V. A. Dorovskikh, V. K. Lifar, 1971). These researchers believe that the preparations of Manchurian clematis act on the organism of experimental animals in the same way as the clematis clematis. With the same pathology in humans, clematis reduced the blood sugar level during glucose loading (MI Aizikov et al., 1976).

The plant is poisonous.

Application form

• A decoction and tincture of the named types of clematis are prepared per daily dose of 0.1–0.2 g of a dry plant.

Burdock
Arctium lappa L

Perennial herb of the Asteraceae family 60–150 cm tall, fleshy root, thick, fusiform, brown; stem is erect, powerful, longitudinally furrowed, green or reddish, branches are numerous, erect, protruding, less often (in shaded places) somewhat arcuate, covered, like the stem, with papillary hairs with an admixture of glands and cobweb-pubescent. Roots are used for medical purposes. Found: fatty oils, bitter substances, ascorbic acid, mucus, mineral salts (V.G. Minaeva, 1991, A.A. Camp, 1992), as well as essential oil (Vegetable …, 1993). Felt burdock seeds contain: fatty oils - 22.1 %; acids: myristic, palmitic, stearic, oleic, linoleic - 67.8 %; triacissi cerola coronary, vernolic, cis-9, 10-epoxyoctadecanoic and trans-9, 10-epoxyoctadecanoic acids; higher aliphatic triterpene alcohols, steroids, acylglycerols (Vegetable…, 1993).

Therapeutic action. Clinical and experimental data have shown that burdock root extract has a hypoglycemic effect and the ability to increase the amount of glycogen in the liver. Juice from fresh leaves of burdock is used in traditional Azerbaijan medicine for diabetes (A.D. Abbasova, 1966). In animals that were injected with preparations of burdock, morphological changes did not always coincide with biochemical parameters: regeneration of alpha and beta cells was observed. But in some cases, alpha cells predominated, and in others, beta cells (M. Mahoux, 1960).

Nutritional value. In nutritional value, the roots of cobweb burdock are considered more tasty than the roots of burdock large. The food use of cobweb burdock is similar to large burdock. In addition, they can be used to make all those dishes that are made from potatoes.

Individual intolerance.

Application form

• Decoction of roots at the rate of 10 g per 200 ml of water is prescribed for 1/2 cup 2-3 times a day.

• Oil extract of burdock roots (40 g of raw materials per 100 ml of olive or almond oil), obtained by infusion for 10 days.

• A teaspoon of crushed roots is poured into a glass of boiling water, infused overnight and filtered.

Onions, garlic

Allium sulfur L., Allium sativum L

Perennial herbaceous cultivated plants of the lily family. Bulbs containing essential oil, saponins, inulin, phytin, nitrogenous substances, carotene, vitamins B1, C, PP,

flavonoids, microelements of selenium, copper, zinc, boron are used.

Therapeutic action. The famous scientist of the Middle Ages Ibn Sina (Avicenna) wrote about the healing properties of onions a thousand years ago. Modern science has fully confirmed the main statements of Ibn Sina. Volatile phytoncides destroy the diphtheria bacillus, the causative agent of tuberculosis; have a bacteriostatic, anti-inflammatory effect against the causative agents of influenza, giardiasis, anthrax, measles, scarlet fever, herpes, candidiasis. Onions and garlic have hypoglycemic properties similar to insulin. The antidiabetic activity of onions has been thoroughly studied by GD Bramahari and KT Augusta (1961). In experiments on rats and rabbits with alloxan diabetes, the authors discovered the healing properties of the juice of the aerial part, dry and essential extract from the bulbs. Fresh juice and aqueous infusion of onion are used in many traditional medicines in a number of countries around the world in the complex treatment of patients with diabetes. In 1957, mannitol was isolated from bulbs, a product used in the diet of diabetics. Not only the onion itself is useful, but also its husk. It contains a large amount of vitamins and sulfur, which lowers blood glucose levels. As a rule, the most common and harmless remedy for the treatment of diabetes mellitus is a decoction of onion peels. Method of preparation: a handful of husks are thoroughly washed and then boiled in a saucepan. The broth can be consumed as a standalone drink or added to tea. No less effectively reduces sugar and the following tincture, but it can be treated only by adults. Finely chop one hundred grams of leeks (white part) and pour 2 liters of red dry wine. This mixture should be infused for 10 days in a cool place. A tincture of 15 ml (tablespoon) is taken after each meal. Duration of treatment for diabetes mellitus 17 days once a year. During the year, the sugar level will remain normal.

Nutritional value. With diabetes mellitus, onions can not only be eaten, but also necessary, without any restrictions in quantity. It is the most effective way to lower blood glucose. The lowering of glucose occurs due to the content of allicin in onions, which has a hypoglycemic property. But it is important

to remember that a specific substance is not able to drastically reduce sugar, like insulin, but allicin lasts much longer. Onions can simply be added to various dishes or used as an addition to the diet, but it is better to prepare special medicinal infusions and tinctures. It is baked onion that is especially effective, and most importantly, it reduces sugar levels without harming health. Sulfur, which is contained in this vegetable, stimulates the synthesis of insulin in the pancreas and increases the efficiency of the food glands. For patients with diabetes, baked onion soup can be recommended.

The glycosides contained in onions affect the activity of the heart, therefore, consuming large amounts of onions is also contraindicated for people with cardiovascular diseases. Care should be taken to use onion-based preparations and the onion itself for gastritis with increased acidity of gastric juice.

Application form

• Allilchep - alcoholic tincture of onions, 20-30 drops 3 times a day for 3-4 weeks.

• Allylglycer: for the treatment of angina, dysbiosis, intestinal atony.

• Onion juice in native form at a dilution of 1: 3 in the form of phyto-inhalations for diabetes mellitus.

Hop-like alfalfa
Medicago lupulina L

Hop-like alfalfa is an annual or biennial herb with a taproot that penetrates the soil to a depth of 40 cm; there are forms that develop for 3 years or more, that is, perennial. Stems ascending or spread over the soil, 10–50 cm long , branched, densely leafy. Leaves with a short petiole, trifoliate,

leaflets obovate or almost rhombic with a wedge-shaped base and a notch at the top. The alfalfa herb contains the most valuable minerals: calcium, magnesium, phosphorus, manganese, iron, zinc, copper, potassium, silicon, sodium, fluorine. Alfalfa contains a large amount of chlorophyll, protein, isoflavonoids such as genisten, daidzein, vitamins A (beta-carotene), D, group B (Bl, B2, B12), C, E, K, as well as a number of proteolytic enzymes that break down proteins and promote their assimilation. In addition, alfalfa contains: alkaloids, asparagine, coumestrol, estrogens, fructose, melonic acid, myristic acid, saponins, stigmasterol, triasontanol, amino acids, anthocyanins, carbohydrates, fiber, fatty acids, medicagol, sucrose, stachydrinone , xylose, enzymes, sugars, pigments, starches, numerous organic acids - lauric, malic, oxalic, and also salicylic, etc. (V. I. Formazyuk, 2003).

Therapeutic action. The name “alfalfa” (from the Latin word “lampshade”, “lamp”, which is associated with the glow of seeds in the pods at night), the plant received in the 17th century. Later, a high phosphorus content was found in the seeds. It was used as a general tonic and an agent that lowers blood sugar and cholesterol levels. The high molecular weight alcohols (triacontanol and octacosanol) contained in the plant reduce cholesterol and lipid levels in the blood, and flavonoids relax smooth muscles. Alkaloids help lower blood sugar levels, and saponins maintain the balance of intestinal flora. The use of alfalfa increases the elasticity of the arteries, prevents the development of atherosclerosis. Saponins and alfalfa fibers are able to bind a significant amount of cholesterol, coumarin derivatives have a mild antimicrobial effect, strengthen the circulatory system. It is widely used in the treatment of diabetes. An aqueous infusion of alfalfa improves the condition of patients with diabetes, lowers blood sugar and urine, and reduces the number of ketone bodies (B. Rubenstein, 1962). The hypoglycemic effect of alfalfa is probably due to the high content of manganese (S. Spektor, 1956). Alfalfa seed oil is a natural environmentally friendly product obtained from alfalfa seeds by cold pressing. Alfalfa oil is widely used in diabetes mellitus, lowers blood and urine sugar, and reduces the amount of ketone bodies. The oil promotes the stimulation of reparative processes in the areas of

mucosal erosion and ulcerative defect in the development of diabetic foot syndrome. Alfalfa oil enhances the body's immune function, accelerates phagocytosis, has an oncoprotective effect, and is an antimutagen.

Individual intolerance and allergy to alfalfa, acute abdominal diseases, diarrhea, intestinal bleeding. Complexes containing vitamin K are contraindicated in people taking drugs that prevent blood clotting (for example, Syncumart). In this case, you should consult your doctor. In case of autoimmune diseases (systemic lupus erythematosus, etc.), alfalfa intake is undesirable.

Application form

• In case of dysfunction of the pancreas and thyroid gland, it is recommended to prepare the following infusion: 2 teaspoons of chopped alfalfa herb pour 200 ml of boiling water, leave for 30 minutes, drink during the day.

• dietary supplement alfalfa.

• Eramin - dry extract of alfalfa herb (Tatarstan);

• Alfalfin-P - paste-like alfalfa seed extract (Kharkov).

Common raspberry

Rubus idaeus L

A shrub of the Rosaceae family, growing on average up to 1.5 m in height, with thorny branches and fragrant tasty fruits. The closest relatives of raspberries are considered to be drupes, blackberries, meadows and cloudberries. Raspberry fruits are drupes that grow together on a receptacle with a complex fruit. Raspberries spice at different times, which depend on weather conditions and place of growth. Raspberry grows almost throughout Russia, except for the far northern

regions. Raspberry berries contain organic acids (citric, salicylic, malic, tartaric, etc.); pectin, dyes and nitrogenous substances; sugars (mainly glucose and fructose); tannins; cellulose; essential oils. Raspberries are also rich in vitamins: A, B1, B2, B9 (folic acid), C, PP, beta-sitosterol, which has anti-sclerotic properties. They also contain minerals, as well as trace elements: copper, potassium, iron (which are especially rich in raspberries), magnesium, calcium, zinc, cobalt. Raspberries contain coumarins, which have the ability to reduce the level of prothrombin and normalize blood clotting, and anthocyanins, which have anti-sclerotic properties and the ability to strengthen capillaries (V. I. Formazyuk, 2003).

Therapeutic action. Fresh raspberry juice is used in traditional Azerbaijani medicine for milder forms of diabetes mellitus (I. A. Damirov, G. B. Bagirova, 1969). Leaves, berries, stems of raspberries and other rosaceous plants (bramble and gray) have an antidiabetic effect. VA Blinov (1999) developed a collection that has antidiabetic action. It contains lilac and walnut. The infusion from it is prepared as follows: 10 g of the product is poured into 400 ml of boiling water in an enamel bowl, which is then placed in another bowl with boiling water (water bath) for 20 minutes. The infusion is cooled at room temperature for at least 45 minutes and filtered through cheesecloth. The prepared infusion is divided into 3 equal portions and taken 3 times a day, one portion 30 minutes before meals for 20-30 days. After 10-15 days, the course is repeated. During the year 4-5 courses are conducted.

An example from practice. *Patient I-ev, 49 years old, non-insulin dependent diabetes mellitus. Upon admission to the hospital, the blood glucose level is 14.1 mmol, the state is depressed, disturbed by crunching and pain in the joints, pain in the eyes, discomfort in the region of the heart. The level of uric acid in the patient's blood was determined, it was 1.7 mmol / l. Prescribed hypoglycemic drugs and herbal antidiabetic collection of composition 3. After 10 days, his blood glucose level was 10.9 mmol / l, and uric acid - 1.1 mmol / l. By the 22nd day of stay in the dispensary, the concentration of glucose in the blood decreased to 8.7 mmol /*

l, and uric acid to 0.72 mmol / l. In total, during the stay in the hospital, the level of glucose in the blood decreased by 38.4 %, and that of uric acid by 2.3 times.

According to the author, the collection, in addition to a pronounced hypoglycemic effect, helps to lower the threshold of sensitivity of peripheral tissues to carbohydrates, has a calming effect, and enhances potency.

Since raspberries contain purine bases (salicylates), until recently it was believed that its use should be limited to patients with nephritis and gout, with intestinal inflammation and diarrhea.

Application form

• BAA "Glucosil", contains blueberries, garlic, St. John's wort, birch leaves, lingonberries, nettles, mint, raspberries, highlander herb, wormwood, elecampane roots, etc.

• Raspberry fruits mixed with rose hips and leaves of black currant, lingonberry and birch (in equal parts) act as a general tonic for diseases of the cardiovascular system. This mixture should be brewed like tea and drunk before meals, 100 g twice a day.

Momordica warranty

Momordica charantia Linn

The plant is an annual, highly branching liana from the pumpkin family, up to 3 m long with very beautiful carved, bright emerald leaves resembling grape leaves. It blooms continuously all summer long with bright yellow, beautiful, shiny flowers with an amazing aroma that attracts many bees

and other beneficial insects. The scientific name comes from the Latin momordicus - “biting”, due to the fact that while the plant is developing, its leaves burn a little when touched. In our country, two species of this plant are grown - momordica harantia (Indian pomegranate) and balsamic *momordica* (*momordica balsamia L.*) (balsamic pear) (V. I. Formazyuk, 2003).

Therapeutic action. It is now known that the CIC-3 protein is responsible for the formation of an acidic environment, as well as the cell granules in which it is located. In the body of laboratory mice, where the action of CIC-3 was blocked by chemical means, the acidity immediately decreased and the production of insulin fell. In addition, using electron microscopes, biologists have studied the CIC-3 protein itself (based on materials from podrobnosti.ua).

Momordica contains lectins (which are analogous to the CIC-3 protein) and proinsulin (of plant origin, similar in composition and structure to animals). Lectins create an acidic environment for proinsulin to convert to normal insulin. Lectins (from *Lat.* Legere - to collect) are proteins with the ability to bind sugars in a highly specific manner. Lectins are usually involved in cellular recognition, for example, some bacteria use lectins to attach to the cells of the affected organism. Lectins and lectin-like components affect the activation of lymphocytes during the immune response, as well as the effector phases - complement-dependent and T-cell cytotoxicity. Also, lectins have a mitogenic effect and blast transformation of leukocytes (leukocyte turns into leukoblast and begins to divide) (according to wikipedia.org).

The various morphological parts (roots, stems, leaves and fruits) of the Momordica plant are used in traditional African medicine to influence, control and / or treat a variety of human diseases, including diabetes mellitus and hypertension. It is especially widely used in Tibetan-Chinese medicine to heal cardiovascular diseases, stomach ulcers, lower blood sugar levels, produce insulin and cure diabetes, slow down aging and prolong active longevity. In order to scientifically evaluate some of the uses of *M. charantia* described in folklore and folk histories, JA Ojewole, SO

Adewole, G. Olayiwola (2006) conducted a study to identify the hypoglycemic and hypotensive effects of an aqueous extract of the whole plant Momordica harantia on rats.

The hypoglycemic effect of the plant extract was investigated in healthy and diabetic rats using a streptozotocin injection-induced diabetes model (STZ). To investigate the hypotensive (antihypertensive) effect of the plant extract, we used rats with normal blood pressure, as well as rats of the Dahl line, sensitive to the development of hypertension when consuming a salt diet with high pressure. Chlorpropamide was used as a hypoglycemic agent for comparison.

Emergency oral intake of the plant extract caused, in a dose-dependent manner, significant hypoglycemia in normal and diabetic rats. In addition, emergency intravenous administration of MCE produced (in a dose-dependent manner) a significant decrease in systemic arterial blood pressure and heart rate in normal blood pressure rats and in Dahl rats sensitive to hypertension on a high-pressure salt diet. Although the exact hypoglycemic and hypotensive mechanisms of action of the plant extract remain controversial at this time, it is unlikely that the herb induces hypotension in experimental mammalian models by involving cholinergic mechanisms, since their cardiovascular system is resistant to the effects of atropine. However, the results of this experimental animal study show that the extract has hypoglycemic and antihypertensive properties and therefore pharmacologically justifies the plant's properties described in folklore in controlling diabetes and hypertension in some rural African communities.

Nutritional value. Momordica is used to prepare a popular exotic curry delicacy - a spicy seasoning made from a mixture of herbs and flavoring plants. It is also used as a side dish for meat and fish dishes, which greatly increases appetite and food absorption. Very tasty momordica jam. By adding alcohol to the syrup from the jam, they make liqueurs, wines, tinctures, liqueurs, tonics.

Momordica is contraindicated in pregnant women, as it can contribute to spontaneous abortion. Patients diagnosed with glucose-6-phosphate dehydrogenase (G6PD enzyme) deficiency should not take Momordica medications.

Application form

• Homeopathic medicine momordica compositum.

Sowing oats
Avena sativa L., Cultivated oat

An annual cultivated plant of the cereal family. Grain contains up to 18 % protein rich in amino acids, B vitamins, fatty oils, starch, flavonoids (C, O-glycosides), stigmasterol, steroid saponins, etc. (V. I. Formazyuk, 2003).

Therapeutic action. In ancient medicine, the nature of oats was recognized as cold-dry. Oats, cooked without oil, were used as a stomach fixer. The disadvantage of oats is that they are hard on the stomach, as they are slow and difficult to digest and generate gas. The negative properties of oats, according to the instructions of ancient physicians, can be prevented with the help of lemon, quince, or by taking a large amount of oil (Muhammad Hussein Sherazi, XVIII century). A decoction of cereals has a tonic, multivitamin, choleretic, hypoglycemic, tonic effect. Oats contain zinc, chromium, B vitamins and vitamin F (V.N. Formazyuk, 2003). These substances are necessary for the body to maintain normal levels of sugar and cholesterol in the blood, normalize weight and cleanse blood vessels from atherosclerotic plaques. Zinc, contained in large quantities in oats, has a hypoglycemic effect, since it regulates the production and functioning of insulin. Chromium, found in oats, regulates blood sugar levels. Oats also lower total cholesterol levels due to their high fiber beta-glucan content. This fiber, which is found mainly in oats, is also effective in regulating blood sugar levels. At the same

time, the fiber contained in oats prevents the absorption of bile salts into the intestinal wall, and this leads to a decrease in the production of cholesterol in the liver. Oats are considered one of the best means for removing toxins from the body, restoring a normal heart rate, treating diabetes mellitus, joint diseases, and intoxication and liver dysfunction. Many gastrointestinal diseases can be treated with oatmeal, whether peeled or unpeeled, taken alone or with other plants. Preparations from the fruits of milk ripeness in the form of infusion and tincture are recommended for the treatment and prevention of disorders of the digestive tract (gastritis, colitis, enterocolitis, irritable bowel syndrome, gastric ulcer and duodenal ulcer, etc.).

According to the descriptions of NN Brezgin (1984), water extracts from oat straw are used as stimulants to stimulate appetite.

The nutritional value. As a rule, nutritious jelly is prepared, which has enveloping, multivitamin properties. They are cooked from the liquid part of the cereal infusion, which has been soaked for 8-12 hours before the cooking time. One of the most valuable dietary products is considered to be a slimy broth of oatmeal, which is part of the most stringent diets for gastrointestinal diseases.

Treatment with a decoction of oats should not be carried out for people suffering from diseases of the gallbladder and liver, renal failure, cardiovascular insufficiency, increased acidity of the stomach, as well as hypersensitivity to the components of the drug.

Application form

• Decoction of oat fruit in a dose of 10 g per 200 ml of water for intake during the day after meals.

• Tincture of oats, 30-40 drops 3 times a day after meals.

Dandelion common (medicinal)
Taraxacum officinalis L

Perennial herb of the Asteraceae family. It grows in meadows, along roads in the European part of Russia, the Caucasus, Central Asia, Siberia and the Far East. Roots are used for medicinal purposes. Raw materials contain triterpene compounds, choline, nicotinic acid, nicotinamide, resins, inulin, organic acids, sterols, trace elements boron, molybdenum, zinc, copper, etc. Inflorescences and leaves contain carotenoids, triterpene alcohols, etc. (A.D. Turova, 1974).

Therapeutic action. There are several versions of the origin of the plant name. According to one of them, the Latin name for dandelion comes from the phrase “wild lettuce”, since the young leaves of the plant are eaten as a salad. The reflex action of dandelion preparations due to the content of bitterness is carried out by irritation of the taste buds of the tongue and oral mucosa, which leads to excitation of the food center, and then to an increase in the secretion of gastric juice and secretion of other digestive glands.

Dandelion’s biologically active compounds also have choleretic, antispasmodic, laxative, diuretic, anthelmintic, tonic, polylypidemic, sedative and anorexic properties (reduce the need for food intake). Dandelion roots and grass are included in antidiabetic preparations (J. Muszynski, 1956). Inulin, contained in dandelion roots, has protective and anti-inflammatory properties against the mucous membrane of the stomach and intestines, and also adsorbs toxic products.

Dandelion preparations, more often in combination with other medicinal plants, are used for anacid gastritis complicated by the pathology of the hepato-biliary system and chronic nonspecific colitis. The roots of the plant are part of gastric, diuretic teas, as well as domestic teas recommended for reducing body weight.

The nutritional value. Young dandelion leaves are used to make healing salads, especially in early spring with hypovitaminosis. Their bitter taste is eliminated if the leaves are kept in salted water for 30 minutes. In France, dandelion has been cultivated as a food plant. Toasted roots are used as a substitute for coffee. Flower buds are pickled and added to saltwort and vinaigrette as a substitute for capers. You can make jam from the inflorescences.

Dandelion juice and tea in therapeutic doses do not give any side effects. Fresh stems can cause symptoms of poisoning, especially in children if they eat a lot of them.

Application form

• Infusion of dandelion roots (5.0-200.0 ml) 1/3 cup 3 times a day 15 minutes before meals for 3-6 weeks.

• Fry dry dandelion roots, pour 1 teaspoon of roots with a glass of boiling water, boil for 10 minutes, squeeze and drink in one go.

Rp. Inf. rad. Taraxici 5.0-200 ml

DS 70 ml 3 times a day 15 minutes before meals.

mistletoe

Viscum album L

A dioecious parasitic evergreen plant of the belt-flowering family. During the first two years, the plant does not bloom. The berries ripen in winter and have their own seed germs, which are carried by birds and can only attach to the bark of a tree with droppings. In the future, the embryo starts up a sprout into the bark that does not quite resemble a root,

since it does not grow further and does not branch. Not all researchers share the opinion about the mistletoe as a parasitic shrub, since, despite the fact that there may be many mistletoe bushes on one tree, the tree does not suffer from this and does not die. A kind of plant symbiosis arises, as a result of which the vitality of the tree does not dry out. Leaves and berries are used for medicinal purposes. The plant contains traces of alkaloids, resinous substances, choline, lectins, tannins, bitter and saponin-containing substances, fatty acids, cerilium alcohol. The most important active ingredients contained in white mistletoe are: lectin, viscotoxin, choline, alkaloids, polypeptides and polysaccharides.

Therapeutic action. To date, there are about two thousand publications devoted to the study of the therapeutic properties of white mistletoe, the study of its composition. Mistletoe is also very beneficial for the pancreas. The mistletoe should be soaked in cold water overnight. During the initial period of treatment, take 3 glasses of water and 3 teaspoons of mistletoe daily. After a few weeks, take 2 glasses of water and 2 full teaspoons daily, and after a few more weeks, take only 1 glass of water and 1 teaspoon. Then stop the treatment, and resume with the onset of spring. Recommended for the treatment of patients with diabetes (J. Muszynski, 1956). Mistletoe retains its medicinal properties from early October to early December and from March to late April. The mistletoe found in oak and poplar groves is best used, but mistletoe found in spruce and orchards also has medicinal properties. Branches and leaves should be cut off. Never use white berries for tea!

Poisonous plant. Internal use requires caution. Contraindications for taking mistletoe are pregnancy, hypotension and individual intolerance.

Application form

• Infusion or decoction of 10 g of a mixture of shoots and leaves in 200 ml of water, 1 tablespoon 3 times a day.

• a teaspoon of crushed leaves and sprigs of white mistletoe in 1 cup of boiled water at room temperature, leave for 8 hours, drain. Take 1/2 cup 3 times a day.

• Iskador is a lectin-standardized solution of a fermented water extract from a white mistletoe plant for the treatment of viral hepatitis and some oncological diseases.

Walnut

Juglans regia L

A tree of the walnut family with a height of 20-30 m and more, trunk diameter up to 1.5 m. The crown is dense, broadly round. The leaves are large (20–40 cm long), odd-pinnate, falling for the winter, fragrant (from essential oil). Flowers are unisexual, monoecious, male in the form of long earrings (during flowering), single female or 2-3 or more at the ends of short annual shoots. The fruit is a drupe (nut) of a round or oblong-rounded shape. The outer pericarp is fleshy, green, the inner (shell) - woody with a fleshy seed (the so-called kernel). Walnut is a moisture- and light-loving breed. It grows best on moderately moist carbonate loams with a low and constant water table. Forms a powerful root system that penetrates deep into the soil. Blooms in April - May; fruits ripen in September - October.

Walnut leaves are rich in tannins and are used as an astringent. For medical purposes, pericarp leaves, fruits containing organic and phenol carboxylic acids, flavonoids (juglanin, avicularin, hyperoside, etc.), anthocyanin, cyanidin, juglone and tannins are used. In addition, they contain a highly active antimicrobial substance - juglone (5-hydroxy- and naphthoquinone), which has antimicrobial, wound-healing properties. Fatty oil consists of glycerides, lemon, stearic, oleic, linoleic, palmitic, linolenic acids. Most of all vitamin C is contained in the shell of unripe fruits, and in its quantity it is not inferior to citrus fruits, black currants and rose hips. Therefore, vitamin concentrates are prepared from the shells of

unripe walnut fruits. Beta-sitosterol was isolated from the shell. The shell contains phenol carboxylic acids, tannins and coumarins, in the pelicul (a thin brown skin covering the fruit) - steroids, phenol carboxylic acids, tannins and coumarins. Walnut leaves contain tannins (3-4 %), glycosides, flavonoids, essential oil, juglone, inositol, carotenoids, vitamins C, B1 and P and a lot (up to 30 %) provitamin A (V.F. Korsun, E . V. Korsun, A. N. Tsitsilin, 2010).

Therapeutic action. In ancient times, the nut was attributed to an antidote effect. There is a legend saying that when Pompey defeated the king Mithridates, he found in his palace a recipe for a remedy that was enough to take in the morning on an empty stomach to protect himself from the action of the most terrible poisons. Infusion of leaves improves metabolism and is used as a tonic for vitamin deficiencies and depletion of the body. Yu.N. Nuraliev, M.U. Sharofova (2007) note that walnut fruits, outer peel of fruits, nut gum, nut oil, juice from walnut leaves or peel of fruits, ash of a nut peel were used in ancient medicine.

They are used for atherosclerosis of the brain, initial and mild forms of diabetes mellitus, decreased blood clotting, pulmonary tuberculosis, trophic ulcers of the leg. When taken orally, the infusion of the leaves reduces the blood sugar content in patients with diabetes (MA Nosal, IM Nosal, 1959). The hypoglycemic effect of liquid extract and infusion of walnut leaves was found in experiments on guinea pigs and rabbits (S. M. Kit, 1960; L. A. Lapynina, 1965; L. D. Shulyat'eva, 1972). The hypoglycemic effect of walnut leaf powder is to normalize carbohydrate metabolism, in particular, to reduce fasting glucose in venous and capillary blood, as well as to decrease daily glucosuria (E.P. Korneva et al., 2006). The data characterizing the hypoglycemic effect were confirmed in experiments on patients with non-insulin-dependent diabetes mellitus II degree, whose diet included the claimed dietary supplement - walnut leaf powder.

In the treatment of diabetes, not only leaves are used, but also the partitions of walnut fruits. A decoction is prepared from them: pour 200 g of boiling water over the partitions from 40 nuts , boil in a water bath for 1 hour, cool at room

temperature and strain. Drink 40-50 g 3 times a day before meals. The course of treatment is at least 3 months. Walnut oil was considered the best remedy for gangrene, erysipelas, diabetic foot (VF Korsun, VV Kovalenko, 1994).

Walnut leaf preparations increase blood clotting! Walnuts are not recommended for bowel diseases, most doctors recommend using them with caution for skin diseases, as well as for any colds - especially when coughing. Eating them on an empty stomach can cause vomiting. In case of overdose and excessive use, they cause vasospasm, diseases of the skin and mucous membranes (rash on the tonsils, ulcers on the tongue, etc.), can provoke an attack of hepatic colic.

Application form

• Infusion of leaves (5.0-200 ml) 1/2 cup 3 times a day.

• Decoction of leaves (4 tablespoons per 0.5 l of water) in the form of lotions for diabetic feet.

• Extract (15 g of crushed leaves per 100 g of refined sunflower oil) for phytoapplications.

• Grepol (hydroalcoholic extract of green fruits of a walnut, birch buds, wormwood herb, licorice roots and cloves) for oral administration, 1 ml 3 times a day with diabetes.

• Parapharmaceutical grepol contains a water-alcohol tincture of green fruits of a walnut, birch buds, burnet, Icelandic moss, licorice, cinnamon.

Peony evading (Maryin root)

Paeonia officinalis L

A perennial herb of the buttercup family 40–100 cm high. The rhizome is powerful, the tubers are fusiform, red-

brown-brown, white at the break, quickly darkening, with a strong specific odor. Stems are thick, erect, numerous, densely leafy, convex-tuberous, with a single apical flower. Leaves are glabrous, petiolate. The leaf blade is divided twice or thrice into lanceolate segments. Blooms from late May to late June. The flowers are purple-pink, large. The fruit is a multileaf national team. The local population calls this plant Maryin root or Maryin herb, heart berries. Seeds ripen in August - September. As a medicinal raw material, plant roots are used, which contain free salicylic and benzoic acids, esters of salicylic and benzoic acids, essential oil (0.14-0.6 %), peonol, ascorbic acid, tannins, pienofluorescin, salicin glucoside, amyloid carbohydrate (S. Ya. Sokolov, 2000).

Therapeutic action. Doctors of Ancient Greece, Rome, China, the countries of the Arab East considered peony roots to be one of the most curative remedies. Peony root has a hypoglycemic effect (L. D. Shulyat'eva et al., 1966). Tincture of peony roots, prepared by maceration for 7 days, on 40 % alcohol in the ratio of raw materials to the extractor 1:10, according to E.A. Trutneva (1961), is low-toxic. In experiments on mice, this tincture causes a sedative effect, has an anticonvulsant effect in convulsions caused by camphor and nicotine.

According to Chinese herbal medicine, the effectiveness of the drug is associated with the effect on the conduction system, the strategic programs of dense organs that unite the pericardial system, as well as the brain (MedLinks.ru). Fidopharm (Vietnam) has developed a herbal remedy "Bo Tan Am", which can be recommended for patients with type 2 diabetes mellitus as an aid in the complex therapy of this disease. This prevents an increase in the dose of sugar-reducing tablets. In persons with a milder form of diabetes in the stage of decompensation, the use of "Bo Tan Am" will allow avoiding the appointment of substitution therapy (http://www.provisor.com.ua). The product contains Remania root - 15 %; dioscorea root - 9.5 %; dogwood fruits - 9 %; nymphaean root - 7 %; desmotichi peony grass - 6 %; smilax rhizomes - 5 %; sugar. The drug has a pronounced diuretic and sedative effect, which improves the course and therapy of

hypertension stages I and II, VSD, astheno-neurotic syndrome. Under the influence of treatment, patients become calmer, their sleep improves, the phenomena of vegetative-vascular dysfunction, headache and lethargy decrease, and efficiency increases.

Evasive peony is a poisonous plant, and its use requires great care and precise dosage. When used for medicinal purposes, peony tincture may slightly increase the acidity of the stomach.

Application form

• In medicine, a 10 % tincture is used, made from herbs and roots in 40 % alcohol. Prescribe it 30-40 drops 3 times a day before meals for neurotic conditions, headache, to improve sleep and increase efficiency.

• Infusion of dry roots in a dose: 1 teaspoon for 3 cups of boiling water, 1 tablespoon 3 times a day 15 minutes before meals.

Plantain large
Plantago major L

Perennial herb of the plantain family. It is found throughout the CIS, with the exception of the Arctic and deserts. It grows near roads and houses, in wastelands and meadows. For medical purposes, plantain leaves are used, which contain aucubin glucoside, bitter and tannins, enzymes, carotene, 289 mg% ascorbic and citric acid, vitamin K, a small amount of alkaloids and phytoncides. The plant concentrates calcium, iron, zinc, molybdenum, barium and chromium (V.F. Korsun, V.K.Viktorov, 2010).

Therapeutic action. This is one of the most ancient medicinal plants. Back in China, it was collected for medical purposes more than 3000 years ago. The ancient Greeks and Romans used plantain seeds for dysentery, inflammatory diseases of the stomach, infertility and other diseases. Avicenna believed that plantain is extremely good for the treatment of ulcers, as it promotes the healing of old and fresh ulcers and "there is nothing better than this." Adhering to human shoes, hooves, and paws of animals, seeds are transported over long distances. Thus, the plant "moved" with immigrants from Europe to North America, where over time the plantain spread everywhere. He was called by the Indians "the trail of the pale face." In the domestic encyclopedia "Cool Helicopter City" it is said: "If a person has taken food or magical rooting in a brush or in a drink, or who has worms inside, he drinks the juice of a small fellow traveler on his heart, and then he accepts purgacea, and from that okormu is delivered, but the worms will drive out.

Glycoside aucubin, flavonoids and other biologically active substances of plantain leaves promote the regeneration of damaged tissues, enhance the secretory function of the stomach, have a sedative, even hypnotic effect, lower blood pressure, and have a beneficial effect on the treatment of acute and chronic colitis. Fresh leaves and sap have a hemostatic effect.

In Chinese and Buryat traditional medicine, it is widely used in the treatment of diabetes (Yu.A. Zakharov, V.F. Korsun, 2002). Plantain leaves are part of the fees prescribed for gastric ulcer and duodenal ulcer. Khadzhai Ya.I. (1958, 1989), on the basis of his own experimental research, developed a preparation of plantain large and called it plantaglucid. The author believes that the drug has a good antiulcer effect in a model of experimental gastric ulcer caused by phenylbutazone. It does not affect the proteolytic activity of gastric juice, but exhibits a weak antispasmodic effect.

Plantain preparations have a regulating effect on the digestive tract, antitumor (V.F.Korsun et al., 2007) and antimetastatic effect (lung and stomach cancer), alleviate the

condition of patients with pulmonary tuberculosis, blood diseases, male and female infertility, atherosclerosis.

Nutritional value. Young leaves are used for food. They are used to prepare salads, vinaigrettes, side dishes for meat and fish dishes. Seeds fermented with milk can be used as a seasoning.

Plantain preparations are not recommended for hyperacid gastritis, gastric ulcer with high acidity; predisposition to thrombus formation, as plantain juice thickens the blood. Amirdovlat Amasiatsi believed that "plantain is harmful to the brain, especially seeds." He proposed to eliminate this harmful effect of plantain with a violet.

Peptic ulcer with high acidity; hyperacid gastritis; predisposition to thrombosis.

Application form

• Plantaglucid 1 / 2-1 teaspoon in 1/4 glass of warm water 20-30 minutes before meals.

• Infusion of leaves (3 g of raw materials per 200 ml of boiling water), 1 tablespoon 3-4 times a day.

• Plantain juice, 1-2 tablespoons per 70 ml of water 3 times a day before meals.

Wormwood

Artemisia vulgaris L

Perennial herb of the Aster family. For medical purposes, an herb is used, which contains 0.02 % of essential oil, the main component of which is pineol (about 50 %). Also contains alpha-thujone, sesquiterpene, adenine, colline and

vitamins C, D, A and group B (V.F. Korsun, V.K.Viktorov, 2010).

Therapeutic action. Artemisia was revered as a ” female medicine” in Russia, the Caucasus and China. The plant in the old days was highly valued in the form of wreaths on the head, it was recommended for various intoxications, for poisoning with mushrooms, hemlock, alcohol, snake bites, etc. In the Middle Ages, herbalists used wormwood for cholera, plague, rheumatism, scurvy, malaria, etc.

It has an antitoxic effect in case of poisoning, intoxication, the use of cytostatics, exhibits an anabolic effect, corrects tolerance to carbohydrates, increases the concentration of insulin in the blood during sugar load in experimental rats. Wormwood contains sesquiterpene lactones, which have bactericidal, antiviral and anti-inflammatory effects. It is noted that azulene has an antibacterial effect; thujone - natural analgesic; ligans are powerful antioxidants. The presence of succinic acid strengthens the immune system, stimulates the production of insulin, lowering blood sugar, and normalizes the functioning of the nervous system (V.F. Korsun et al., 2010). Wormwood is part of the dietary supplement “Glucosil”, Bittner’s balm to stabilize carbohydrate-fat metabolism, support the body in diabetes.

The long-standing reputation of wormwood as an anthelmintic has been preserved. Back in 1830 , a pharmacist from Dusseldorf isolated santonin from citrine wormwood. Russia had a world monopoly on its supply to the world market. The steppe regions of the country became inexhaustible sources of raw materials, and Orenburg and Chimkent became processing centers.

The plant has contraindications for use: pregnancy and the period of breastfeeding, old age in combination with overweight. The plant should not be used in any form and for those who suffer from alcoholism, diseases of the gastrointestinal tract, including ulcers of the stomach and

intestines, thrombophlebitis. Take preparations containing wormwood for no more than 2 months.

In recent years, brilliant wormwood (*Artemisia glabella*) has been of great interest . The drug arglabin, which is a biologically active sesquiterpene lactone, was obtained from it (S. Adekenov, 2000). When administered, beta-cell division is stimulated, which may help in the treatment of type 2 diabetes.

Application form

• Infusion (1 g per 200 ml of boiling water) for taking 1 tablespoon before meals.

• Tincture of wormwood, 20-30 drops per appointment.

• Stomach drops 5 drops 3 times daily before meals.

• Stomach tablets 1 piece 3 times daily before meals.

Garden purslane

Portulaca aleracea L

An annual plant of the purslane family. The garden purslane has a recumbent stem, medium-sized fleshy leaves and small yellow flowers. The fruit is a capsule, when ripe, small black seeds spill out. Purslane grows in damp sandy places, it can often be seen in vegetable gardens, near dwellings, in gardens and in fields. It is believed that the plant is native to the western part of India, from where it spread to other southern regions of the globe. Purslane can be considered a cosmopolitan - it grows in Europe, Australia, China and the Middle East. In the wild, it is found in Ukraine, in central and southern Russia, in the Caucasus, in Central Asia. Shoots and young leaves of purslane contain a lot of carbohydrates and proteins, vitamins C, E, K, PP, glycosides, alkaloids, minerals and organic acids. They are also rich in macro- and microelements, including calcium, magnesium, sodium, iron, zinc and manganese. Scientists have found

norepinephrine and dopamine in purslane leaves (V.N. Formazyuk, 2003).

Therapeutic action. The useful properties of purslane were appreciated by Hippocrates. He believed that this plant is able to cleanse the body, and recommended it to the elderly and sick during the recovery period after long illnesses. Avicenna mentioned purslane many times in his writings. An aqueous infusion of purslane herb led to a more rapid normalization of blood sugar levels after glucose loading in rabbits. In 3 hours after administration, hypoglycemia was noted, which was not observed in control animals (A. I. Karaev, M. Hanukaev, 1966). In the majority of patients with diabetes of mild and moderate severity, infusion, decoction, grass juice, alcoholic extract in combination with a diet eliminated all manifestations of the disease (S.A.Mametzade, 1964).

An extract from purslane leaves improves the course of alloxan diabetes in rats and rabbits, normalizes fat metabolism in severe forms of the disease (Zh. Stepanova et al., 1966), increases carbohydrate tolerance as a result of increased insulin production and improved glycogen formation (A.I. Karaev, E M. Khanukaev, 1960). Purslane can have a hypoglycemic effect, which allows it to be included in the diet in patients with diabetes mellitus. But despite the revealed and proven properties, the use of purslane in official medicine is still only advisory in nature.

Garden purslane is not prescribed for hypertension and bradycardia. Contraindicated in patients with a tendency to diencephalic crises and increased convulsive readiness.

Application form

• Eat young shoots and leaves, as well as flowers. Juicy greens have a pleasant aroma and a tart, slightly pungent sour taste that gives a sensation of freshness. Greens quench thirst, stimulate appetite, and increase vitality.

• Purslane is edible raw in salads, it is tasty and boiled - in soups and sauces, as well as stewed. Greens are good for pickling for future use.

• It is also used as a spice.

Pterocarpus marsupial (jacket)
Pterocarpus marsupium Roxb

A genus of trees in the legume family. The name itself comes from ancient Greek and means ” winged fruit”, thanks to the unusual shape of the fruit of these trees. It is a large deciduous tree, up to 30 m tall, one of the species of the genus pterocarpus of the legume family. Homeland - India, Nepal, Sri Lanka. It grows in central and southern India and Sri Lanka.

Therapeutic action. Already one and a half thousand years ago, they were described in the classical works of the most ancient - from the officially recognized today - traditional medical system Ayurveda (“the science of life”). Biologically active substances contained in the bark and wood of this large deciduous tree, which is found only in certain regions of India and the island of Sri Lanka, have a pronounced hypoglycemic, blood-purifying, anti-inflammatory and astringent effect (L. Miller, 2010).

Skillfully using this wonderful gift of living nature, tested by centuries of experience, it is possible to really stop, “block” the undesirable development of a number of diseases associated with metabolic disorders, and above all - diabetes. The phyto-chemical composition of this plant is currently well studied and described many times in modern medical literature.

Along with other bioflavonoids, it contains a rare component of this class, L-epicatechin, which normalizes carbohydrate metabolism at the cellular level. At the same time, it stimulates and “revitalizes” the beta cells of the islets

of the pancreas, which produce their own insulin for the body. In addition, the plant's astringents slow down the production of glucose by the liver.

Numerous independent scientific and clinical studies both in India and in other countries indicate that the preparations obtained on the basis of marsupial pterocarpus can be successfully and without side effects used as part of complex therapy in the early stages of hyperglycemia, with impaired carbohydrate tolerance. a hereditary predisposition to type 2 diabetes, as well as obesity and overweight. This was illustrated, in particular, by targeted trials carried out in 1993-1995 at four endocrinology centers of the Indian Council for Medical Research, during which 97 patients were examined. As a result of a 12-week course of treatment, 70 % of them showed a noticeable decrease in blood sugar levels. The pronounced hypoglycemic effect of L-epicatechin was also confirmed by the experiments of a group of specialists from the Department of Pharmacology and Toxicology, Faculty of Pharmacy, University of Pittsburgh (USA).

It is characteristic that already in antiquity it was subtly noted that the best effect is given by the regular use of just freshly prepared cold infusion of wood. This feature predetermined a very unusual, "exotic" way of using this amazing plant. Initially, small bars or pieces of its wood were placed overnight in a vessel with water, and the next morning they consumed the obtained tart brown infusion with a slight bluish opalescence, having previously filtered it through a cloth. In the middle of the twentieth century, a number of prominent Ayurveda specialists who practiced and gained recognition in the West proposed a "mirror-like" improvement of this method and made a small reusable glass from aged wood of the marsupial pterocarpus. On the one hand, this made it possible to increase the initial concentration of a fixed portion of the infusion and then gradually decrease it as it was taken, and on the other, to make the procedure extremely convenient and economical.

This allows you to optimize the production of your own insulin and normalize carbohydrate and fat metabolism with their subsequent stabilization. Also increases the sensitivity of

tissues to insulin and the utilization of glucose from the blood. Obenil contains an extract of the famous plant.

Application form

• “Glass” made of wood for the preparation of infusion and ingestion.

• Obenil - tablet form, which contains this plant.

Remania sticky
Rhemania glutinosa Stend

A perennial herb of the Scrophulariaceae family 10–30 cm high. The whole plant is covered with soft gray-white hairs. Fleshy roots, fusiform, tuberous-thickened, with light bark. Stems are straight, almost leafless. Leaves are oblong-obovate, wrinkled, irregularly serrate-toothed at the edges, collected in a basal rosette. The flowers of the gummy gummy are large, funnel-shaped, almost white; in the fauces they are purple-violet, collected in a rare apical raceme. Corolla tube is elbow-bent; calyx cherry red, longitudinally furrowed. Fruits are egg-shaped capsules with numerous small seeds. Remania sticky blooms in March - May. In the wild, remania is found in China. It is cultivated as a medicinal plant in Korea, Japan, Vietnam. Not found in Russia, but can be cultivated in the southern regions of the Far East and European Russia. For medicinal purposes, they use the fleshy roots of Remani Chinese, which are dug up in autumn or early spring. Less commonly, grass collected during flowering is used. The roots of Chinese Remania contain mannitol, lekhmanin, remanin, flavones, carotene, alkaloids, sucrose, fructose, rhamnose, fatty acids (Yu. A. Zakharov, 2000).

Therapeutic action. In Chinese medicine, remania gummy is considered one of the popular medicinal plants. It is used as a tonic, tonic and hematopoietic agent. Preparations from the dry roots of Remania are prescribed for sexual

weakness, spermatorrhea. In Korea, a decoction of roots with honey is used to prevent aging of the body. Remania herb is included in the "core" of a number of oriental medicine recipes used for impotence. In a mixture with other plants, remania is used for pollutions, spermatorrhea, oligospermia and as a tonic.

Contains glycosides that have a therapeutic effect in diabetes mellitus (L. D. Shulyat'eva, 1967). In China, remania is considered a plant that "tones the blood." From the rhizome of remania, drugs are obtained that have a beneficial effect on the blood, tone up, and improve metabolism. Remania is widely used for kidney diseases, including renal failure. Remania has been shown to improve kidney function; stimulates the processes of renal tissue regeneration and restoration of renal function; has a pronounced diuretic effect; promotes the normalization of urination, prevents renal bleeding, improves the functions of the urinary and reproductive systems, prevents kidney damage in diabetes; facilitates the course of insulin-dependent diabetes mellitus. Moreover, herbal preparations help reduce blood pressure in kidney disease.

Inflammation of the spleen, loose stools.

Application form

• Decoction of Remania roots. A single dose is a decoction of 5–20 g of raw materials.

Agrimony medicinal (hairy)
Agrimonia pilosa L

Based on the data of traditional medicine, the attention of scientists from the Siberian Medical University was attracted by the hairy agrimony of the *Rosaceae* family , as

well as a number of plants of the *Asteraceae* and *Urticaceae* families , which have a wide raw material base. E. A. Krasnov, M. G. Vinokurova, V. V. Dudko et al. (2006) developed an optimal technology for obtaining aqueous and aqueous-alcoholic dry polyextracts collection. Studies on the content of biologically active substances using qualitative reactions and chromatographic methods (BC, TLC) showed the presence of a significant amount of polysaccharides (inulin), flavonoids, phenol carboxylic acids (caffeic, ferulic), saponins and tannins (5.1 ± 0.48 %) …

The hypoglycemic activity of the obtained extracts was assessed on the models of adrenaline hyperglycemia and alloxan diabetes, and the dynamics of the body's sensitivity to the biological effect of insulin against the background of the introduction of the extracts was investigated using the "insulin resistance" test. The antidiabetic collection "Arfazetin" was used as a reference drug. It was revealed that the studied extracts, depending on the dose and mode of administration (single and course), reduce the severity of hyperglycemia with the introduction of adrenaline, and in alloxan diabetes, they demonstrate a distinct hypoglycemic effect.

The most active was the water-ethanol extract, lowering the glucose level by 48.11–53.6 %, significantly exceeding the reference drug (10.03–12.05 %). The chemical composition of the agape genus is represented by various groups of compounds: flavonoids (quercetin and its glycosides, as well as 7-glucosides of luteolin and apigenin), polysaccharides, phenol carboxylic acids (caffeic, chlorogenic, ellagic), coumarins and tannins. In the course of pharmacological tests of the extract of agrimony, the functional state of the central nervous system in rats was investigated in the experiment "hexobarbital test".

After the course administration against the background of experimental hepatitis, agine extracts increased the time of falling asleep in experimental animals, which is regarded by the authors as restoration of the functional state of the central nervous system. Based on the data obtained, it is assumed that one of the groups of biologically active substances responsible for the functioning of the hepatobiliary system is flavonoids.

The quantitative determination of the latter was carried out spectrophotometrically at a wavelength of 400 nm after the formation of colored complexes with an alcoholic solution of aluminum chloride using a standard sample of luteolin-7-glucoside (cinnaroside). It was found that the content of flavonoids is 10.58 ± 0.22 %. Thus, as a result of the carried out chemical and pharmacological studies, the authors have created the prerequisites for the creation of new phytopreparations with hepatoprotective and hypoglycemic activity.

Agrimony is contraindicated in chronic constipation.

Round-leaved sundew
Drosera rotundifolia L

Perennial herb of the sundew family. This extremely small plant is especially common in the northern and central regions of our country, mainly in peatlands. The entire upper side and edges of each leaf are seated with tentacle hairs with a red glandular head. The glandular hairs are short in the center of the leaf, and longer along the edges. The head of the hair is surrounded by a transparent droplet of thick, sticky, viscous mucus. Small flies or ants, attracted by the glitter of these droplets, land or crawl onto the leaf and stick to it. The insect rushes and fights, trying to free itself from the trap, and at the same time inevitably touches the neighboring sticky drops. All hairs of the disturbed leaf bend towards the prey and soon envelop it with mucus.

Biochemical studies have identified the following enzymes produced and secreted by the glands of insectivorous plants: peroxidase, albonuclease, lipase, esterase, acid phosphatase, amylase. In mucus, acidic polysaccharides are also found, consisting of xylose, mannose, galactose, and clucuronic acid. Under the influence of such a complex

secretion, insects decompose in a relatively short time and are gradually absorbed by the same glands into the plant. Rosyanka contains droserone, methyjuglone, plumbagon, organic acids, mucus, tannins and dyes.

Medicines are prepared from round-leaved sundew herb. It is stored during the flowering of the plant, then dried in a ventilated room or under a canopy in the open air.

Therapeutic action. Rosyanka has expectorant, antispasmodic, soothing properties. Dewdrop is advised in the treatment of respiratory diseases: whooping cough, bronchitis, cough, bronchospasm. It inhibits the growth of microbes: pneumococci, staphylococci, streptococci, etc. Traditional medicine advises to use the round-leaved sundew as a mild diaphoretic and antiemetic agent. Rosyanka is used to treat fever, atherosclerosis and asthma. The juice of a fresh plant is used externally to remove freckles, calluses and warts.

In diabetes mellitus, tincture and liquid extract from sundew are used (J. Muszynski, 1956).

This is a poisonous plant, so you need to take it with great care and under the supervision of a doctor.

Application form

• Tincture: pour 50 g of fresh grass of the round-leaved sundew plant with 1 glass of 40 % alcohol , then set it to infuse for 10 days in a dark place and shake it periodically. Clean the tincture by draining it through cheesecloth, squeeze out the raw materials. Consume 10 drops per glass of water 3 times a day.

• Infusion of herbs (1 tablespoon of raw materials per 400 ml of boiling water, insist for 2 hours, filter) drink 1/2 cup 3 times a day before meals. The infusion has a sedative, hypotensive effect; it is used for atherosclerosis, diabetes mellitus, and the initial stage of dropsy.

Mountain ash

Sorbus aucuparia L

A tree of the Rosaceae family, up to 20 m in height (mainly 4–6 m), less often a shrub with a superficial root system. Fruits are spherical, apple-shaped, bright red or orange-red, juicy. It grows along the banks of rivers, lakes, in fields, along roads, in the undergrowth of coniferous and mixed forests, along forest edges, it is planted in squares, parks and gardens. Fully ripe rowan fruits are harvested in August - October, before the onset of frost (E. I. Formazyuk, 2003).

Therapeutic action. The plant has anti-inflammatory, hemostatic, capillary-strengthening, vitamin, astringent, mild laxative, diaphoretic, diuretic action, lowers blood pressure, increases blood clotting. Mountain ash pectins prevent fermentation processes in the intestines, reduce gas formation and, having adsorbing properties, promote the binding and elimination of various toxins.

Organic acids and bitterness of mountain ash increase secretion and enhance the digestive ability of gastric juice, which, along with the choleretic effect, helps to improve digestion. Oil extracts from rowan fruits, containing a significant amount of carotene and carotenoids, have an early and ulcer healing, anti-inflammatory effect, contribute to the formation of less rough scars. In the experiment, rowan fruits reduce the content of lipids in the liver and cholesterol in the blood. For diabetes, a water extract from berries is used (J. Muszynski, 1956).

Contraindications - hypersensitivity, pregnancy, lactation, children under 14 years of age.

Safflower

Carthamus tinctorius

An annual herb that is used to produce dyes. It grows wild in the Mediterranean and is widely cultivated in Spain, Portugal, Austria, Hungary, France, India, Turkey, Iran, Afghanistan, China, USA, Australia, Brazil and Central Asia, including Uzbekistan (L. Miller, 2010).

Therapeutic action. Scientists have found that drinking at least one teaspoon of safflower oil a day for two months leads to an increase in the level of "good" cholesterol in the body by 15 %, helps to inhibit inflammatory processes in the body of diabetics and increases their sensitivity to insulin. A human gene that carries information about the structure of insulin has been inserted into the safflower genome. Insulin accounts for 1.2 % of the total protein in the grains of the plant, which is even more than is necessary to ensure profitability of production.

Several insulin plantations owned by Sembiosis are located in Canada, the United States and Chile. If the company can prove that plant insulin is identical to human insulin, it can gain access to the pharmaceutical market without a full cycle of lengthy and expensive clinical trials. This may prove to be a very timely step, as the incidence of diabetes is growing rapidly worldwide and new methods of administering insulin, such as inhalation, are significantly increasing drug consumption.

Currently, the insulin that diabetes patients need is produced by genetically modified bacteria, which are kept in sealed containers. It is planned to grow genetically modified plants for the production of insulin outdoors.

Safflower oil has no contraindications, the exception is individual intolerance to the product.

Fragrant celery

Apium graveolens L

Biennial herbaceous aromatic plant of the umbrella family (Apiaceae). In the first year of life, forms a rosette of leaves, in the second year - stems 30–100 cm in height. Leaves are odd-pinnate, shiny above, matte below. In leafy and petiolate varieties of celery, the root system is fibrous, in the "root" - the roots are fleshy, round-flat or almost spherical.

Celery is a cultivated herb that comes from the Mediterranean. In Russia, the most common varieties are Yablochny, Prazhsky, Gribovsky. Leaves and roots (both fresh and dried), as well as fruits ("seeds") are used for medicinal purposes. The roots contain organic acids (malic, succinic, citric, tartaric, oxalic, glycolic), essential oil (1 %), polyacetylene compounds, phthalides, phenolcarboxylic acids and their derivatives (V.I. Formazyuk, 2003), sugars (1.8 –3.4 %). The leaves contain essential oil, phenol carboxylic acids (ferulic, coffee), flavonoids, vitamin C (14-180 mg%).

Medicinal use. This plant was widely known in Ancient Greece and Ancient Rome. The Greeks decorated their homes with celery garlands, and the heads of the winners in various competitions with wreaths. The respectful attitude of the ancients to the culture of celery is also evidenced by the fact that its leaves were minted on Greek coins as early as the 5th century BC. e.

Celery preparations raise the general tone of the body, enhance physical and mental performance, stimulate the activity of the kidneys, and improve the blood supply to the internal organs. The mucus contained in the roots of the plant has enveloping properties, helps to reduce inflammation and pain. Celery is especially useful for diabetes, hypertension, bronchial asthma. Celery roots contain the sweet-tasting polyhydric alcohol mannitol, which is a sugar substitute for diabetic patients. The plant also contains glycosides that have a positive effect on diabetes (ZK Aliev, 1964).

Pregnant women and patients suffering from kidney inflammation should refuse to use it.

Application form

• Infusion of roots. Pour 1-2 teaspoons of crushed raw materials with 1 cup of boiling water, insist until cooled, drain. Take 1/3 cup 3 times daily before meals.

• Cold infusion of roots. Pour 2 tablespoons of chopped raw materials with 1 glass of cold boiled water, leave for 2 hours, strain. Take 1/3 cup 3 times daily before meals.

• Infusion of fresh roots. 1 tablespoon of finely chopped roots pour 1.5 cups of boiling water, leave for 4 hours, drain. Take 1 tablespoon 3-4 times a day half an hour before meals.

• Infusion of fruits. 1/2 teaspoon of raw materials pour 1 glass of boiling water, insist until cooled, drain. Drink during the day in 3 doses.

• Cold infusion of fruits. Pour 1 teaspoon of fruits with 2 cups of cold boiled water, leave for 8 hours, drain. Take 1 tablespoon 3-4 times a day half an hour before meals.

Bitter core

Cardamine amare L

An annual herb of the cruciferous family. The bitter heart prefers pure running water from springs, streams, small rivers, and usually settles near them. Its thin greenish-yellow rhizomes, getting into the water, actively branch. Aerial shoots depart from them. The flowers of this core have white petals, although plants with a lilac color of the corolla are rarely found. The anthers of the stamens are purple. His homeland is the Middle East. Occurs in mountainous areas up to the upper border of the forest, near springs, along the banks of streams and rivers, in wet meadows and in alder forests. Cultivated in

France and Egypt. Blooms from April to June. Leaves are used that contain many vitamins (V. Petkov, 1988).

Therapeutic action. The plant is used as a diuretic, anticonvulsant, antiscorbutic, and also as a remedy for colds. Recently, in Slovakia, core leaves have been used as a medicine for diabetes. An extract from this plant, taken internally, significantly reduces the blood glucose level of rabbits (J. Koctencky, 1967). Adults drink the juice of the plant 1 tablespoon with whey several times a day. Flower powder 1 g is taken in the morning and in the evening with water. An aqueous infusion of herbs (1 tablespoon per 1 glass of boiling water) is given to children from seizures.

Excessive consumption of fresh herbs, as well as overdose when brewing tea, should be avoided, otherwise irritation in the stomach and kidneys is possible.

Serpukha oval (crowned)

Atractyles ovata Dc, Serratula

Perennial herb of the Asteraceae family. The rhizome is short with long adventitious roots. The stem is straight, not pubescent. Leaves are petiolate, leathery, shiny, bristly-serrate along the edge, simple or pinnately-divided. Flower baskets with a green multi-row wrapper and often surrounded by leaves. The flower petals are white. Blooms in June-July, bears fruit in August-September. The seeds are small. Crowned Serpukha grows in dry meadows, the edges of South Polesie, in the forest-steppe (except for the extreme West) and in the north of the steppe part of Ukraine.

Botanical scientific name of the plant - Serratula - comes from the Latin word serra - “saw” (ribbed-furrowed leaves resemble saw teeth). Medicinal raw materials are rhizomes with roots, the aerial part of the plant: flowers, leaves, fruits and seeds. The raw materials are collected in the usual way.

The aboveground part - during the flowering of the plant; roots - in autumn before the plant wilts; seeds - as they ripen. Dried outdoors in the shade. All parts of the plant contain essential oil. The rhizomes contain carbohydrates and related compounds: arabinose, galactose, glucose, sucrose, raffinose; azulene compounds: atractilone, atractilol; sesquiterpenoids, coumarins, rubber, trace elements. The aerial part contains vitamins, organic acids, pigments. The seeds contain fatty oil (http://www.narmedick.ru). Crowned sickle, containing ecdysteroids, is of great interest.

Therapeutic action. The herb of serpuha oval contains alkaloids, ascorbic acid, organic acids, flavonoids, which have choleretic, astringent, anti-inflammatory, sedative, laxative and antiemetic properties. Atractilodes is one of the most used ingredients in oriental medicine recipes. Roots and rhizomes in Chinese and Korean medicine are used as an analgesic, diuretic, diaphoretic, anti-inflammatory, appetite-improving and general tonic. The aerial part of the plant in collections - for asthenia, gastritis, dyspepsia, anemia, ascites, arthritis, rheumatism, leprosy, chicken pox, malignant tumors. Leaves, flowers, stems in Chinese medicine are used for cholelithiasis, chronic nephritis, diabetes mellitus, dysentery, as a diuretic.

F.I. Ibragimov, V.I. Ibragimova (1960) report on the hypoglycemic effect of serpukha. Under the influence of this plant, the glycogen content in the liver and muscles decreases, while in the myocardium it increases. A decoction of serpukha roots has an antidiabetic effect in rats with alimentary hyperglycemia and alloxan diabetes (L.D.Shulyat'eva, 1964).

To date, no contraindications have been identified for the medicinal use of serpukha.

Application form

• An infusion of serpukha oval herb is prepared as follows: pour 2 teaspoons of crushed dry raw materials with

300 ml of boiling water, leave for 1 hour, strain, take 1-2 tablespoons 4 times a day 30 minutes before meals.

• For tincture, take 100 g of roots, grind and fill with 40 % alcohol or vodka, infuse at room temperature for 10 days. Take 40 drops per reception 3-4 times a day before meals.

Runny ordinary
Aegopodium podagraria

Perennial herb of the umbrella family with a long creeping rhizome. The stem is straight, slightly branched at the top, thick, ribbed, hollow, glabrous, up to 150 cm in height. The lower leaves are on long petioles, dvadtrychatyeva, consist of 9 lobules with a hole at the top. The upper leaves are small, on short petioles widened in the sheaths. Apical umbel with 20–25 coarsely pubescent rays, lateral umbels are smaller, sterile, and are absent. Petals are white, deeply globular at the apex.

Gardeners spend a lot of effort to remove it from their site, not knowing that this herb is a very valuable medicinal, one might even say, a unique remedy. Distributed throughout the European part, in the Caucasus, in Central Asia, Western and Eastern Siberia. It grows on rich fertile moist and damp soils in mixed forests, in clearings, clearings, in gardens, parks, like a weed. Snake contains nitrogenous compounds, among them such an important substance as choline, a large number of trace elements, one of which is titanium, which is not produced by the body. The leaves contain nitrogenous compounds, including choline, which plays an important role in metabolism, vitamin C (up to 60-100 mg% or more), citric, malic acids, flavonoids, quercitin and kaempferol, strengthening the walls of blood vessels, essential oil, mineral salts … The rhizomes contain essential oils, saponins, starch, and resins (P.A.Kyosev, 2000).

Therapeutic action. In his dictionary, Dahl explains that the plant is called “to sleep” (not to sleep), “just as the German

botanists who worked for us wrote down the Russian names of plants by hearsay, so we accepted them, distorted in all textbooks". The Latin name of the genus is derived from two Greek words *aegos* - goat and *podion* - leg. The plant received it for the shape of the petals, reminiscent of the footprint of a goat's hoof, and the specific name indicates the medicinal use of gout. Sleepy has a diuretic, anti-inflammatory, analgesic, vitamin, detoxifying, diuretic and emollient effect, improves digestion. The use of dreams strengthens the body, removes toxins from it, regulates the liver at the cellular level, cleanses the blood, strengthens the heart muscle, the walls of blood vessels and capillaries, enhances protein synthesis, and reduces smooth muscle spasm. This plant is still little studied, but already now we can say that in case of complications of diabetes, drooping can be very useful. Fresh grass of the plant, before the appearance of white umbrellas of flowers, is plucked and salads are prepared from it.

Sleep has no contraindications and side effects.

Application form

• Infusion from the herb of dreaming: take 15 g of raw materials, pour 400 ml of boiling water, leave for 2 hours, then filter. Take half a glass 4 times a day.

• The juice from the dream is obtained by squeezing fresh young plants from the aerial parts. Take a third of a glass with a tablespoon of honey.

Soybean cultural
Glycine L

Soybean belongs to the annual herbaceous cultivated plants of the legume family. India and China are rightfully considered the homeland of soybeans. Soybeans are protein-

oil crops. It has a high protein content (up to 45 %), oils up to 25 %. For comparison, soy contains more protein than eggs, and generally ranks first in terms of fat composition. Soy proteins are water-soluble, they are better absorbed by humans and animals, they have an optimal ratio of amino acids, close to animal protein, but, unlike it, soy proteins enter the body without cholesterol. Soy proteins contain almost all the useful and essential amino acids. High quality oil is obtained from its seeds. Soy is also rich in minerals such as potassium, magnesium, copper and iron, manganese, zinc and phosphorus. Vitamins A, B, C, D, E, and K and glycosides and other beneficial substances can be found in soybeans. According to the Institute of Nutrition of the Russian Academy of Medical Sciences, the inclusion of soy drink, soy kefir (yoghurt), bean curd (tofu) in the diet of diabetic patients within a four-week period made it possible to achieve a pronounced hypoglycemic effect in patients with diabetes mellitus (form 1-2) against the background of cancellation or reducing the dose of conventional antidiabetic drugs, including insulin (A.K.Baturin, 2012).

Therapeutic action. In diabetes mellitus, soy is especially valuable, since soy flour contains fewer carbohydrates than other legumes, and the value is an order of magnitude higher than the same beans. Soy is used to treat radiation sickness and diseases of the central nervous system (diabetic polyneuropathy, etc.).

Soy is contraindicated during pregnancy, lactation (breastfeeding); hypersensitivity to drug components.

Stakhis (Japanese potatoes, Chinese artichoke, khorogi, chisinets)

Stachys siboldin

It is a perennial plant of the Yelnotkov family, an ancient vegetable and medicinal plant, introduced to Russia from Mongolia since 1976. This is a herbaceous plant with a pubescent, branched stem, reminiscent of a mint bush, 30-50 cm high. The leaves are large, dark green, the flowers are combined into long, spike-shaped inflorescences, propagates only by nodules. This undemanding frost-hardy plant grows well on fertile and light soils with moderate moisture. Many valuable microelements have been found in stachis nodules, including the powerful antioxidant selenium (boosting the immune system), potassium, calcium, magnesium, sodium, copper, zinc, etc. (V.I. Formazyuk, 2003).

Medicinal use. China is considered its homeland, where it is still found in the wild. In Europe, stachis began to be distributed only in the 19th century, and it was brought to Russia at the end of the 20th century from Mongolia for a scientific purpose. Nowadays, it is gradually being introduced on personal plots by only a few gardeners.

This medicinal plant has long been used in folk medicine (especially in China), it is recommended for diseases of the stomach and intestines, for hypertension, tuberculosis, flu, colds, atherosclerosis. Stachis tubers do not contain starch, therefore they are an ideal food product for patients with diabetes mellitus. Stakhis prevents the development of many diseases, including cancer.

According to the traditional medicine of the East, where stachis is widespread, its nodules help to improve digestion, and also have a therapeutic effect in diabetes and hypertension.

TE Trump, S. Ya. Sokolov, VK Kolkhir (1985) for the first time in Russia carried out an experimental study of the pharmacological properties of stachis grown in our country. They conducted research on the effect of galenic forms from nodules on carbohydrate and lipid metabolism in an experiment with alloxan diabetes. Also, the influence of a number of dosage forms on the cardiovascular system and hemocoagulation activity was studied, and the parameters of acute and chronic toxicity of the plant were determined.

As a result of the experiments, it was found that a 20 % tincture of stachis nodules in 40 % alcohol has a positive effect on carbohydrate and lipid metabolism in animals with experimental alloxan diabetes. After a month of administration of stachis tincture, the blood glucose level decreased by 2 times compared to the control, and with an increase in the dose to 1 ml / 100 g, the hypoglycemic effect of stachis increased. 2 weeks after discontinuation of the drug, the reduced blood glucose level increased, while in the control animals the blood glucose level continued to increase. At the same time, a clear tendency towards a decrease in serum cholesterol and triglyceride levels continued. The insulin content in the blood in the experimental animals is 3 times higher than in the control group.

Chronic administration of stachis tincture to rabbits with impaired carbohydrate tolerance leads to an increase in glucose tolerance under conditions of carbohydrate load. The analysis of glycemic curves shows that under the influence of stachis tincture, the processes of glucose utilization in the body are enhanced. The noted pattern manifests itself to varying degrees, depending on the initial state.

Histochemical study of the content and distribution of glycogen in the liver showed that under the influence of stachis, the content increases by 1.65 times and the distribution of glycogen in the liver of animals with alloxan diabetes normalizes.

Stachis tincture has a hypotensive effect, causes vasodilation of the isolated ear of rabbits and has some antispasmodic activity and anticoagulant effect.

When studying the parameters of acute toxicity, it was found that the LD50 for mice after intraperitoneal injection is 24.8 ± 6.76 ml / kg. Under the conditions of a chronic experiment on rats with daily administration of stachis tincture into the stomach for 12 weeks, no toxic effect was found. According to the classification existing in Russia, stachis tincture can be classified as a relatively harmless substance.

There are no contraindications for eating stachis.

Nutritional value. A lot of healthy and tasty dishes can be prepared from this vegetable. Rinse the nodules well (if necessary, wipe with a brush, washcloth), boil for 5–7 minutes, then fry in vegetable or butter with onions, add greens, peas. They can be dried, ground on a coffee grinder and added to pancakes, sauces, salad: rinse the nodules, boil in salted water for 5 minutes, add chopped eggs, green onions, season with mayonnaise or sour cream.

Application form

• 20 % tincture in 40 % alcohol for use, 1 ml 2-3 times a day.

Stevia rebo
Stevia rebaudiana Bertoni

Perennial herb from the Asteraceae family. Stevia grows in South America, the greatest use of stevia is noted in Paraguay. Honey stevia is a plant whose leaves are 10–15 times sweeter than sugar, and the extract prepared from leaves is 150–400 times sweeter. Vitamins A, B1, B2, E, C, D, F, PP, aluminum, iron, calcium, cobalt, silicon, magnesium, manganese, sodium, tin, selenium, zinc, phosphorus, chromium, 17 amino acids, in including eight irreplaceable (not synthesized in the body), and other useful substances (VI Formazyuk, 2003).

Therapeutic action. Stevia preparations have antimicrobial, antifungal effects. Can be used as a substitute for sugar in the diet of patients with diabetes. The healing properties of stevia are very diverse and some of them act at the cellular level. The plant has an antitoxic effect; restores the metabolism of fats, carbohydrates, proteins, water-salt; normalizes the work of enzyme systems; improves liver function, protecting against fatty degeneration; enhances immunity; improves the endocrine system; stabilizes blood

pressure; improves the work of the cardiovascular system; normalizes blood composition; improves vision and the functioning of the digestive system.

For medicinal purposes, leaves are used, which contain up to 7 % of the stevioside glycoside, which is 300 times sweeter than sugar. Therefore, endocrinologists often recommend that sweets use sweeteners such as stevioside (stevia extract). By studying stevia, scientists have found that it is 300 times sweeter than sugar. Numerous studies of stevia extract have proved that with regular intake of stevioside, most of the subjects showed a decrease in blood sugar levels, and diabetes mellitus entered the stage of compensation. In addition, stevia can be used not only in tea, but also in the preparation of many dishes.

Stevia is also rich in vitamins A, B, C, PP and trace elements magnesium, calcium, zinc, phosphorus, selenium. Thanks to this content, stevia has a great effect on our body: it normalizes blood sugar levels, strengthens the vascular wall, prevents the appearance of malignant neoplasms, and helps to eliminate toxins from the body.

As statistics show, each Paraguayan eats about 8 kg of stevia per year . At the same time, the incidence rate of diabetes mellitus in Paraguay is at the lowest level and is less than 1 %, which is ten times less than in the United States and Europe.

NS Fayzullaeva (2007) investigated the physicochemical and technological properties of the dry extract of the aerial part of stevia according to TU 64-179-87-720-01. The dry extract from the aerial part of stevia is an amorphous polydisperse powder of light yellow color, which has a slight hygroscopicity, has a strong sweet taste and a bitter aftertaste; easily soluble in water, alcohol, insoluble in ether, chloroform and acetone. The author has selected the composition and technology for obtaining oral antidiabetic drugs in the form of granules and tablets.

You should also take into account the individual intolerance of plant components. When stevia is taken, even in small doses, there is sometimes an increase in heart rate, and large doses often have the exact opposite effect, slowing down the heartbeat.

Application form

• In the form of food additives “Stevia extract”, “Mediostevin”, “Persevit” in phytodietology for patients with a number of diseases (diabetes mellitus, atopic dermatitis, necrobiosis lipoid, etc.).

• Herb extract for taking 1 ml 2 times a day for diabetes mellitus and for the prevention of possible complications during prolonged insulin therapy.

Sumach tanning

Rhus coriaria L

Shrub or small tree of the family of cashews from 1 to 3 m high. The bark of trees and mature bushes is brownish, friable. On annual shoots, the bark is brownish, roughly pubescent, on perennial trunks and branches it is dark brown. Leaves are alternate, pinnate, with 4–8 pairs of sessile opposite leaves, roughly pubescent, dark green above, almost gray below, 15–20 cm long, 1.5–3 cm wide, oblong-ovate, with a wide, wedge-shaped base and pointed apex, coarsely serrate at the edges. The flowers are unisexual, small, greenish-white, inconspicuous, collected in large conical apical and smaller axillary inflorescences in male and female panicles. Male panicles are spreading, 25 cm long , female ones are denser, 15 cm long . Sepals are rounded, green, petals are ovate-elongated, whitish. Fruits are small, globular or kidney-shaped single-seeded red drupes. Blossoming time June - July. Secondary flowering is sometimes observed in autumn. It grows on dry rocky limestone slopes and in sparse forests in

the lower and middle belts of the mountains. Sumac tanning is widespread in the Crimea, Central Asia, the Caucasus and Transcaucasia. Grows on rocky, rocky and limestone slopes of mountains, rising to a height of 900-1800 m above sea level. Cultivated as an ornamental and medicinal plant. Sumach leaves contain up to 25–33 % tannins, of which 15 % is tannin. In addition, they contain free gallic acid, gallic acid methyl ester, phenol carboxylic acids, ascorbic acid, myricitrin and other flavonoids (Yu. Nuraliev, M. Sharofova, 2011).

Therapeutic action. The alcoholic extract and infusion of leaves are popularly drunk in the initial stage of diabetes mellitus. Infusions and alcoholic extracts of sumach significantly reduce blood sugar and the amount of glycogen in the liver (P.V. Karaev et al., 1953). Plants with antidiabetic action - sumac and scumpia - were studied in the aspect of phytochemical research by G. Ya. Chernyshov and LM Krechetovich (1962). According to their data, sumach leaves contain 27–30 % tannides, which apparently have a beneficial effect on carbohydrate metabolism. The local population of Central Asia, Transcaucasia brews 1 teaspoon of fruits in a glass of boiling water, insists 1 hour, drinks 1-2 tablespoons 3-4 times a day.

Nutritional value. The fruits are eaten in dried and pickled form, as a seasoning for meat and fish dishes. Sumac spice is widely used for salads, meat, fish dishes, goes well with legumes, poultry, vegetables, cereals. Sumac is great for pickling, stewing, making sauces, dressings, and canning.

You can not use it for acute and chronic gastritis, gastric ulcer with increased secretion of gastric juice. Sumac is contraindicated in patients with increased blood clotting due to the risk of thrombosis.

Application form

• 1 teaspoon of fresh sumach leaves to insist 1 hour in 1 glass of boiling water, drain. Take 1 tablespoon 3-4 times a

day.

Mushroom drier
Gnaphalium uliginosum L

An annual herb of the Asteraceae family, 5–20 cm high. The root is thin, weakly branched. The stem is branched from the base. Flowers (baskets) are small, arranged in bunches at the ends of branches and surrounded by radiantly diverging long upper leaves. The leaves are small, linear-oblong, with a clearly visible main vein. The whole plant is grayish tomentose from abundant pubescence. Blooms in June - August. Swampy cane grows like a weed in fields, vegetable gardens, fallow lands, along muddy and sandy shores of reservoirs, along damp roads, along ditches and swampy places. The medicinal raw material is herb. Contains alkaloids, essential oils, carotene, vitamins C and B, tanning and coloring agents (VF Korsun, VK Viktorov, 2010).

Therapeutic action. The generic name comes from the Greek word gndphalon - wool, felt, which indicates the woolly-felt pubescence of the plant. Its preparations soothe the nervous system, help with headaches, insomnia, lower blood pressure, dilate peripheral vessels, which is very important in the formation of diabetic antopathies, enhance regeneration processes in tissues, and enhance intestinal motility. The therapeutic effect of the marsh caddieres is attributed to the complex effect of vitamins and other substances contained in the plant (alkaloid gnaphalin, resins, tannins), and mainly to provitamin A - carotene, which has the ability to increase the immunobiological properties of the body in various pathological processes. The infusion of creeper grass is used for mild forms of diabetes (A.D. Turova, 1967). The cinnamon herb lowers blood sugar levels, increases the body’s tolerance to carbohydrates, has a potentiating effect on the hypoglycemic effect of insulin, which, in turn, accelerates the compensation process (Yu.A. Zakharov, V.F. Korsun, 2002).

The infusion is often used: 10 g of chopped herbs are poured into 400 ml of boiling water, insisted for 2 hours in a sealed container, filtered. Take 1/2 cup 3 times a day before meals. In case of trophic changes in the feet (brittle nails, cracks, hyperkeratosis) characteristic of diabetes mellitus, foot baths are recommended; 50 g of chopped herbs in a bucket of boiling water is insisted as it cools for 1-1.5 hours.

Yu. A. Zakharov (2000) developed a collection recommended for insulin-dependent diabetes mellitus. Medicinal herbs enriched with chromium ions are additionally introduced into the composition of the medicinal collection: ginseng, eleutherococcus prickly, high aralia, high lure, acantopanax sessile, calopanax seven-lobed, licorice naked, atraktylodes ovoid, flax seed, burdock root, hvart maned caragana, black nightshade, Amur velvet bast, Manchurian walnut leaves, creeping wheatgrass, true bedstraw, field barnacle, eastern ditty, winter-lover umbrella, bean shell, vetch seeds, maize flowers, hops, Fischer's rhizomes, small-leaved codwood fragrant kupena, tansy-leaved cinquefoil, canadian small-petal, Oldgem's cinquefoil, alantholist walnut, new fence, Lindley's steak, high gastrodia, broad-leaved cattail, pink rhodiola, marsh cinnamon, common yew, black-footed yew, common bilberry , Chinese cinnamon, lingon ku ordinary, marsh blueberries, dogwood, Chinese yam, Baikal skullcap, Chinese chrysanthemum, Chinese coptis, Chinese wolfberry, Japanese honeysuckle, Gingerbread cardamom, Pueraria hairy, foxglove, Dioscorea, nodule asparagus, stinging nettle, Donstragon yellow and dandelion officinalis.

The proposed drug collection in the described proportions, enriched with chromium ions, allows gradually in the process of taking the drug collection to reduce the dosage of insulin individually for each patient as compensation, but on average 0.3-0.5 U of insulin per month until the complete cancellation of substitution therapy … This is due to the normalization of the function of the islet part of the pancreas due to the poorly differentiated cells of the intercalated pancreas involved in the formation of insulin and the partial restoration of the function of beta cells of the islet part of the

pancreas by targeted action on it through the hypolamo-pituitary system.

Contraindications: arterial hypotension, thrombophlebitis. Prolonged intake of infusions and decoctions of marsh creeper does not cause negative side effects in patients.

Application form

• Infusion: 10 g of crushed dry grass herb is poured with 2 cups of boiling water, boiled for 5 minutes, infused for 2 hours. Take 1 / 2-1 / 3 cup 2-3 times a day after meals.

Meadowsweet (meadowsweet)

Filipendula ulmaria L

Perennial herb of the Rosaceae family . Creeping rhizome, stems 75–150 cm tall, ribbed, densely leafy. The leaves are intermittent, green above, whitish-tomentose below. The flowers are numerous in the final, large, paniculate inflorescence. Plotters are loose, single-seeded, non-opening leaflets. Found in Europe, Central Asia, Siberia, the Caucasus. Grows in wet floodplain meadows. The grass and roots of meadowsweet contain flavonoids, saponins, tannins, the leaves contain ascorbic acid, and the flowers contain flavonoids, essential oil, sterols, phenol carboxylic acids, phenol glycosides, and tannins. In addition, the plant contains chalcones, catechins, glycerides, triterpenic acids, beta-carotene. In the underground organs of the plant, tannins of the pyrocatechol group were found (S. Ya. Sokolov, 2000).

Therapeutic action. OD Barnaulov and ML Pospelova (2005) experimentally studied the antidiabetic and antihyperglycemic properties of the infusion of meadowsweet flowers. Infusion of plant flowers 1:10 was administered at a

dose of 0.5 to 5.0 g / kg (based on the weight of air-dry raw materials) through a probe against the background of alloxan diabetes. It was found that a single and course infusion of meadowsweet flowers did not change the basal level of glycemia in intact rats and mice. A single administration of the drug also did not change the glucose tolerance of animals, but reduced hyperglycemia in alloxan-diabetic rats and mice. The drug reduced the toxic diabetogenic effect of alloxan, which was regarded by the authors as a manifestation of an increase in the body's resistance to the damaging agent (alloxan).

The most pronounced dose-dependent effect was observed when used at the maximum dose of the drug - 5 g / kg per day for 7 days. Meadowsweet significantly increased the concentration of insulin and C-peptide in the blood due to the restoration of the insulin-reducing function of the beta cells of the islets of Langerhans. One of the mechanisms of the activity of the glycemic action of meadowsweet infusion, according to the authors, may be a decrease in the level or activity of contrainsular hormones.

Doctor O. Zemsky (1984) argues that instead of cloves, you can use meadowsweet (meadowsweet) for its pronounced antiviral effect. Using his "triad", he received good clinical results in: diabetes mellitus, type 2, chronic cholecystopancreatitis, cardioneuroses, increased lability of the nervous system, vegetative-vascular dystonia. In his "troichetka" he used tansy instead of black walnut. Outwardly, a decoction of the herb is used to wash wounds and ulcers against the background of diabetes. You can also use a tincture: 50 g of meadowsweet herb is taken on a bottle of vodka and stored in a dark place for a week. After that, you can treat trophic ulcers with the resulting remedy. The tincture is an antibacterial agent and has a beneficial effect on scarring of open ulcers (V.F.Korsun et al., 2001).

Contraindications: hypotension, constipation.

Application form

• 1 teaspoon of meadowsweet herb with flowers, pour 1 glass of boiling water and keep in a sealed container for 2 hours. Take 1 tablespoon every 2 hours before meals.

Tekoma (Kampsis)

Tecoma campsis Stans

A genus of plants of the Bignonium family. Trees or shrubs with pinnate or (rarely) simple leaves. The flowers are large, with a bell-shaped or tubular-funnel-shaped corolla, collected in racemose or paniculate inflorescences. The fruit is a capsule. About 16 species, distributed from Argentina to the West Indies, Florida and Mexico. Current erect *(T. stans) is* widely cultivated in warm countries as an ornamental shrub. Under the name Tekoma, species of other closely related genera of the Bignoniaceae family are known in culture, especially the genus *Campsis:* rooting campis (*C. radicans) is a* woody vine with aerial roots on stems, with large feathery leaves and bright orange or scarlet flowers, cultivated in Crimea and other southern regions of the European part of the USSR, the Caucasus and Central Asia, and large-flowered campis (*C. grandiflora)* , characterized by the absence or a small number of aerial roots; less common in culture.

No contraindications noted.

Therapeutic action. The alkaloids tekomin and tekostatin, contained in the leaves of the plant, have a pronounced hypoglycemic property, are effective for animals with alloxan diabetes when administered orally and intramuscularly (J. Hammouda, 1966).

Jerusalem artichoke (earthen pear)

Helianthus tuberosus L

The earthen pear is still not well known in our country. Her homeland, America, came to Russia in the 19th century. The stems are very leafy, the flowers are yellow, similar to small sunflowers. Seeds ripen only in the south. The roots are shallow, nodules up to 5 cm in size, of various shapes and colors - white, pink, yellow and purple. They are eaten. They are superior in nutritional value to many vegetables. By autumn, the aboveground part dies off. Nodules can be dug out throughout the summer. Remaining in the ground for the winter, they do not die - in the spring they grow again. In this way, the plant reproduces.

The stems and leaves of the plant are used to feed livestock, including rabbits, and are not inferior in nutritional value to meadow hay. If you plant it along the border of the site, you get a beautiful, high, green hedge. Jerusalem artichoke can be used to shade hives and as a late crop that continues honey harvest. In early summer, nodules develop slowly, and from July they grow rapidly. The nodules are planted in spring and autumn to a depth of 8–10 cm. Before planting, dried nodules are dipped into water for 2–3 hours. In the spring, when seedlings appear, they are fed with urea (10–15 g per 1 m2, (NK Kochnev, MV Kalinicheva, 2002).

For medicinal and dietary purposes, plant tubers are harvested, which contain up to 80 % inulin, fiber and a rich set of minerals (mg% on dry matter): 10.1; manganese - 44.0; calcium - 78.8; magnesium - 31.7; potassium - 1382.5; sodium - 17.2; silicon - 8 % calculated on dry matter. The Jerusalem artichoke tubers also contain proteins, pectin, amino acids, organic and fatty acids. By the content of vitamins B1, B2, C, Jerusalem artichoke is richer than potatoes, carrots and beets by more than 3 times. A significant difference between Jerusalem artichoke and other vegetables is manifested in the high content of eight essential amino acids - arginine, valine, histidine, isoleucine, leucine, lysine, methionine, tryptophan and phenylalanine (N.K. Kochnev, M.V. Kalinicheva, 2002).

Therapeutic action. Abroad (USA, Japan, Holland), Jerusalem artichoke plant raw materials are considered as a

source of inulin, the therapeutic and prophylactic effect of which is known for patients with diabetes mellitus. The medicinal and dietary properties of Jerusalem artichoke are largely due to the presence of inulin, a polymer homologue of fructose. Inulin acts as an active sorbent capable of binding and removing from the body a large amount of toxic and ballast substances that enter the body with food or are formed in the intestine during digestion, which is important in toxic hepatitis and hepatosis. Inulin is also known as a biogenic factor that promotes the growth of natural intestinal microflora (usually bifidobacteria) in various diseases associated with dysbacteriosis. The use of inulin in medical practice contributes to the normalization of intestinal activity (elimination of constipation) and a decrease in the content of lipids and cholesterol in the blood. The priority in the study of medico-biological properties of non-traditional plant culture of Jerusalem artichoke belongs to Novosibirsk scientists (V.N. Zelenkov, 2012).

ZT Fayzieva (2007) studied acute toxicity and biological activity in the experiment of Jerusalem artichoke infusion at a concentration of 1:10. The studied infusion was administered orally at a dose of 26 and 50 ml 45 min before glucose administration and 30–60–120 min later with subsequent determination of the blood glucose level. It was noted that the studied infusion at the 60th minute of the experiment at a dose of 25 ml / kg reduces the blood sugar level in relation to the control one by 30.9 %, and at a dose of 50 ml / kg by 32.1 %.

Inulin stimulates the motor activity of the digestive tract (motility and peristalsis), which is valuable in the hypokinetic form of biliary dyskinesia. Inulin and its cleavage products have a pronounced choleretic effect, which is enhanced due to the facilitation of the outflow of bile from the liver and gallbladder into the duodenum, due to improved bowel emptying.

Organic polyoxyacids, contained in abundance in Jerusalem artichoke, neutralize the disease-causing effect of aggressive free radicals and under-oxidized metabolic products. In this case, a physiological alkaline reaction is

established in the intestinal lumen, which is necessary for the normal enzymatic digestion of food.

Clinical trials of dietary supplements “Dolgolet”, carried out in the clinical nutrition clinic of the Institute of Nutrition of the Russian Academy of Medical Sciences, confirmed the therapeutic effect on a group of patients with type 2 diabetes mellitus in the stage of metabolic sub- and decompensation with corresponding pathology of the cardiovascular system and diseases of the gastrointestinal tract (micro- and macroangiopathy, arterial hypertension, chronic gastritis, duodenitis, cholecystitis, irritable bowel syndrome, etc.).

VN Zelenkov (2001) confirmed, while taking a new product, a tendency towards depression of the humoral link of immunity in patients, which was manifested in an increase in the concentration of immunoglobulins A, G, C3, C4 of complement components. It was found that the use of Jerusalem artichoke dietary supplements increases the number of lymphocytes in patients with insulin-dependent diabetes mellitus (IDDM) by 1.3 times, while the activity is most pronounced in the case of a newly diagnosed disease. It was noted that under the influence of Jerusalem artichoke concentrate, an increase of 1.3 times in the number of T-total lymphocytes and 1.5 times of T-helper lymphocytes is observed, mainly at the initial stages of IDDM. With a disease duration of more than 15 years, a decrease in the number of T-suppressor lymphocytes by 1.4 times is observed. The ratio of T-helper and T-suppressor lymphocytes under the influence of Jerusalem artichoke concentrate increased 1.8 times with the most pronounced effect with a longer duration of the disease.

Jerusalem artichoke provides an increase in resistance to bacterial and viral infections of the digestive system, as well as the introduction of various parasites (lamblia, opisthorchis, etc.). At the same time, plant products increase the effectiveness of specific antiparasitic treatment of opisthorchiasis, giardiasis, and even cause massive death of parasites without the use of pharmaceuticals (NK Kochnev, MV Kalinicheva, 2002).

Products and dietary supplements from Jerusalem artichoke are used for chronic inflammatory and parasitic diseases of the liver and biliary tract (duodenitis, giardiasis, opisthorchiasis, cholecystitis, etc.).

Nutritional value. This vegetable with diabetes mellitus can be eaten raw, as well as prepared various dishes from Jerusalem artichoke: add to salads, boil, stew, fry, pickle. In addition, delicious and healthy pancakes are made from it. It is recommended to eat Jerusalem artichoke fresh, especially for patients with diabetes mellitus, hepatosis, liver cirrhosis: 2-3 nodules 3 times a day 10 minutes before meals. It tastes like a radish. Earthen pear salad is useful in spring, when there are no vegetables yet. The nodules should be peeled like carrots, grated, mixed with chopped hard-boiled egg and herbs, salt to taste and served with sour cream or mayonnaise. You can add peeled and chopped nodules to sauerkraut salads, tomatoes and apples. The nodules boiled in salted water taste like cauliflower. An earthen pear can be baked in the oven and eaten with butter without removing the peel, but to cook a fried pear, you need to pour boiling water over it, dry it a little, chop it and, with salt, fry it like potatoes or in boiling oil, like donuts. Jerusalem artichoke can also be canned by adding onion or garlic, carrots and pouring tomato juice and vinegar (50 ml per 1 liter of filling), pasteurized on a general basis.

Diet coffee is made from earthen pear, very aromatic in taste. Pour boiling water over thinly sliced pieces for 2-3 minutes, drain and dry, fry in the oven. The industry is currently producing bread, beer, biscuits and other dietary products from Jerusalem artichoke.

Received a new drug glykoinuvit, which has a hypoglycemic effect (D. N. Sattorova et al., 2003). The drug lowers sugar levels by 26–32.1 % in acute hyperglycemia caused by hypertonic glucose solution in the experiment, and in alloxan diabetes, the maximum therapeutic effect was observed especially after 20 days of administration of the drug. At a dose of 25–50 mg / kg, the drug enhances the work of the heart, increases the voltage of the P and T waves, has a positive effect on metabolism, without exerting a local irritating, cumulative and allergic effect.

There are practically no contraindications to the use of Jerusalem artichoke.

Common beans
Phaseolus vulgaris L

An annual herb of the legume family. It was brought to Europe during the second voyage of Christopher Columbus. Common beans came to Russia from Poland at the beginning of the 18th century. In our country, it is grown everywhere, with the exception of the northern regions (V.I. Formazyuk, 2003).

Trigonelline (betaine), the insulin-like substance arginine, the amino acids tyrosine, leucine, lysine, tryptophan, asparagine, tannins, saponins, phaseololutein and other isoflavones, as well as kiesel acid are found in bean pods. These substances that reduce the level of glucose in the blood, S. Collip called glycokinins. They are soluble in water, 75 % alcohol, and their advantage over insulin lies in their non-protein nature (they are not destroyed in the alimentary canal, they can be used internally). In terms of copper and zinc content, beans are superior to many vegetables. Some varieties of beans contain agglutinins (lectins) - compounds involved in the development of immunity (immunity) to a number of infectious diseases (influenza, intestinal infections) and the treatment of diabetes mellitus.

Therapeutic action. M. A. Lyass, V. A. Vovsi (1930) described the so-called insulin-like action of beans. In 1946, liquid and dry extracts with insulin-like action were prepared from bean husks and proposed for pharmacological research. Experiments and clinical trials have confirmed this effect: bean extracts significantly reduced blood sugar levels. The maximum drop in this level reached 40 %, the duration of the action of the extract is almost 10 hours. As a medicinal form in

medicine, a decoction of leaflets and bean husks is also used for diabetes mellitus at a rate of 1:10 (the raw material is poured with water, boiled for 10-15 minutes and two- three times a day, half a glass 30 minutes before meals). In official medicine in some European countries, beans are used for diabetes mellitus, especially in the elderly, in combination with synthetic drugs. Bean pods and especially bean husk extract reduce blood sugar in diabetic patients. The chemical composition of the pods is not yet fully understood.

In experiments, the hypoglycemic property of decoction of bean husks was established. Studies on animals (mice, rabbits) have shown that under the influence of bean extract, blood sugar levels are reduced by 30-40 %. The duration of action of the liquid extract is 6–8 hours; dry extract - up to 10 hours Beans are more often than other plants with hypoglycemic properties recommended for the treatment of patients with diabetes (J. Muszynski, 1954; BI Lidsky, 1957).

Extract from the husk of beans harvested in the fall, reduces blood sugar by 30-40 % for 8-10 hours (E. Yu. Shass, 1952) and increases urine output up to 50 %.

Recently, a promising drug Carb Block has been developed abroad, containing phaseolamine, a means that helps to normalize metabolism and weight. Product Components: Proprietary Bean Extract (*Phaseolus vulgaris*) Phaseolamine 2250 is the latest in natural weight loss. According to clinical studies, this extract blocks the absorption of starch and the conversion of carbohydrates into sugar, reduces body fat while maintaining muscle mass, lowers blood glucose and cholesterol levels, reduces appetite and increases performance.

Phaseolamine is the main active ingredient in Golden Slim tablets. Carb Block is designed to support a low-carb diet. Now you can eat carbohydrate-rich foods and drinks without any harm to your health. Two Carb Block tablets will help the body neutralize 38g of sugars. Contains the patented ingredient Phaseolin EX ™, a highly purified herbal extract rich in Phaseolamine. Phaseolamine interferes with the release

of alpha-amylase and the enzyme responsible for the breakdown and absorption of carbohydrates. Carb Block also contains Gymnemalin ™, which has a hypoglycemic effect and, when combined with chromium compounds, alpha lipoic acid and vanadium, increases insulin sensitivity and moderate insulin release from carbohydrate-rich foods. The product contains magnesium oxide, phaseolin extract, hymnemalin, alpha-lipolic acid, chromium picolinate, chromium polynicotinad. Other Ingredients: Phaseolus vulgaris extract, Gymnema Sylvestre extract, magnesium stearate, stearic acid. Recommendations for use: take 2 tablets 20-30 minutes before the main meal.

Abuse of beans is contraindicated in case of gout, nephritis, cholecystitis, colitis, gastritis and ulcers with high acidity, people in old age and in case of individual intolerance.

Application form

• Decoction of beans is effective in mild to moderate forms of diabetes. It is even more effective to use beans in combination with blueberry leaves.

• Phaseolin - an extract from the husk of beans harvested in the fall: add 1 liter of water to 100 g of the husk of beans, boil to half the volume, drink the resulting residue throughout the day.

• Liquid bean extract is taken 10-15 drops several times a day, dry extract - 1 g 3-4 times a day. In severe diabetes mellitus, the hypoglycemic effect is not very pronounced, however, with the combined administration of tincture of zamaniha and insulin, the concentration of glucose in the blood and urine decreases more than with the administration of insulin alone, which in some cases makes it possible to reduce the dose by 10–20 U.

Sacred ficus (banyan tree)

Ficus religiosa L

An evergreen tree of the mulberry family, native to India, Nepal, Sri Lanka, southwestern China and the Indochina Peninsula. It is distinguished by strong grayish branches with heart-shaped leaves 8–12 cm in size, with smooth edges and a long drip tip. Leaf veins are clearly visible. Bowler-shaped inflorescences give inedible fruit inflorescences, which, when ripe, acquire a purple color (L. Miller, 2010).

Therapeutic action. Preparations from the bark of ficus, administered to rabbits, within 12 hours have a distinct hypoglycemic effect (SH Abmike Roo, 1967). The bark of the sacred ficus is part of himkolin.

Application form

• Tincture: 2-3 ficus leaves are poured with a glass of vodka and insisted in a cold place for two weeks for 2-3 weeks. It is rubbed into the skin over the sore spot with soft, careful movements, then a warm cloth is applied on top and fixed.

Horsetail
Equisetum arvense L

A perennial spore-bearing herb with a long black-brown rhizome that forms shoots. Spore-bearing shoots grow in early spring. They are branched, short (10–25 cm), juicy, light brown and white-pink. Each shoot ends with an oval-cylindrical spore-bearing spikelet. Spores are spherical, green. Stems and branches are hard, rough to the touch due to the crystals of silicic acid formed on them. Field horsetail is widespread throughout the middle zone of the European part of Russia. It grows on fallow lands, along roads, in ditches, in meadows, in rare spruce, light coniferous, linden, birch and

mixed forests. More common in floodplains, near water bodies. A vicious weed of vegetable gardens, orchards and fields. Horsetail herb contains silicic acid, saponins, alkaloids, flavonoids, tannins, malic acid, resins, bitterness, essential oil, vitamin C, carotene (V.F. Korsun, V.K. Viktorov, 2010).

Therapeutic action. Horsetail preparations have a diuretic, hemostatic, anti-inflammatory and disinfectant effect. Most often, a decoction or infusion of horsetail is used as an effective diuretic for edema accompanying cardiovascular diseases, inflammation of the bladder, exudative pleurisy, and also in some forms of pulmonary tuberculosis with impaired silicate metabolism. Horsetail preparations also provide a therapeutic effect in the treatment of mild and moderate diabetes mellitus (J. Muszynski, 1954), especially in diabetic nephropathy. Horsetail herb is a part of the collection "Arfazetin-E". The collection infusion has a hypoglycemic effect, helps to reduce blood glucose levels, and increases carbohydrate tolerance. It is a source of silicon necessary for the formation of collagen found in various types of connective tissue, thus facilitating the repair of cartilage. Decoctions and infusions of horsetail treat rheumatism, gout, urolithiasis and cholelithiasis, diseases of the respiratory system, they are taken as hemostatic agents. In addition, the infusion of horsetail herb is used externally in the treatment of skin diseases (chronic ulcers, purulent wounds, boils, eczema). With inflammation of the mucous membranes of the mouth and throat, rinse the mouth with infusion.

Horsetail infusion is not recommended for nephritis, nephrosis and other severe kidney diseases, since the irritating effect of the substances it contains increases the inflammation of the renal tissue.

Application forms

• Infusion: 10 g (2 tablespoons) herbs pour 200 ml (1 glass) boiling water, leave for 1 hour, filter. Take from 1-3 tablespoons to 1/3 cup 4 times a day after meals.

• Broth: 5 g (1 tablespoon) herbs pour 200 ml (1 glass) boiling water, boil for 30 minutes, infuse at room temperature for 1 hour, filter. Take from 1 tablespoon to 1/4 cup daily after meals.

• Infusion for external use: 5 g (1 tablespoon) of herbs are poured with 200 ml (1 glass) of cold boiled water, insisted for 24 hours, filtered. Used for lotions and washings.

• Horsetail liquid extract. Cook with 40 % alcohol in a ratio of 1: 5. Take 1 teaspoon 3-4 times a day.

• Horsetail herb tea. Insist 1-2 teaspoons of chopped herbs in 250 ml of cold water for 12 hours or pour hot water and strain after half an hour. Drink 3 cups a day for quite some time.

• Horsetail bath: 100 g of grass is infused in hot water for an hour; the resulting infusion is added to a bath filled with water. Horsetail baths relieve most rheumatic diseases and metabolic disorders in gout.

• Gerbafol - a combined herbal preparation; has a diuretic, anti-inflammatory and antimicrobial effect.

• Bekvorin - a collection of herbs including birch leaves, orthosiphon staminate leaves and horsetail herb.

• Marelin contains dry extracts of horsetail herb, madder rhizomes and roots, goldenrod herb, monobasic magnesium phosphate, korglikon, kellin, salicylamide. It is used as a diuretic, antispasmodic and anti-inflammatory agent, 2-4 tablets 3 times a day before meals for 20-30 days.

Common chicory
Cichorium intybus L

Perennial herb of the Asteraceae family. It has a long taproot and lactifers in all organs. Flowers are ligulate, blue, collected in sessile baskets. Distributed in the European part of Russia, Central Asia, the Caucasus, Siberia. It grows like a

weed along the edges of roads, ditches, less often in crops. In culture, chicory salad and root are cultivated. For medical purposes, roots are harvested containing sugars, including inulin, ascorbic acid, vitamin A, essential oil, methoxycoumarin, chicorine, sesquiterpene lactones, phenol carboxylic acids, bitter, protein and resinous substances (S. Ya. Sokolov, I. P. Zamotaev , 1984).

Therapeutic action. Chicory was known to both the ancient Egyptians and the ancient Romans. A description of it can be found in the Roman writers Pliny, Palladius, Columella, Horace and many others. The first mention of it was placed in the book of the Strasbourg physician Jerome Braungschweig, and the gardener Timme from Thuringia is considered the inventor of cyclic coffee. The history of cyclic coffee is amusingly described by Forrster in 1773. In Russia, written mentions of cicory coffee first appeared in the Rostov district of the Yaroslavl province, where chicory still occupies large areas.

In the encyclopedia “Unnecessary for the ignorant” (A. Amasiatsi, 1990) it is said: “Strengthens the stomach, dissolves (compaction) of the spleen and moderates (heat) the blood. Chicory causes good chyme to form. “

The root has a stimulating effect on the secretion of the stomach, pancreas and biliary tract, as well as anti-inflammatory, desensitizing, astringent, sedative, cardiotonic effects. Chicory preparations reflexively increase the secretion of gastrointestinal juice and peristalsis, regulate defecation, and increase appetite. In traditional medicine in Russia, it is used as a means of increasing appetite, choleretic and improving digestion, helping to normalize metabolism, removing excess cholesterol from the body. In addition, chicory has been found to have antimicrobial and astringent properties.

A decoction of chicory roots has a hypoglycemic effect. According to S. Arullani (1937), after taking 200-300 g of raw materials, the blood sugar level decreases by 18-44 %. These results were confirmed by N. Ploese (1940), who observed a 15–20 % decrease in sugar levels after taking juice from

chicory leaves. The pronounced hypoglycemic activity of dry extract from chicory roots at a dose of 50 mg / kg with intragastric administration was confirmed by Tajik scientists on a model of alloxan diabetes (Yu. N. Nuraliev et al., 1984). OI Yavorsky (1997) found that the hypoglycemic effect of the total extract from chicory roots in conditions of alloxan diabetes is associated with its polysaccharide complex. Electron microscopic examination of the ultrastructure of the pancreas of experimental animals made it possible to establish that the therapeutic effect arises due to the protective effect of chicory preparations on the membrane structures of the beta cells of the islets of Langerhans. In addition, the introduction into the body of a polysaccharide complex, the structural basis of which is the non-insulin dependent sugar fructose, normalizes the body's carbohydrate metabolism. The absorption of fructose through the wall of the digestive tract is much slower than glucose and sucrose. This prevents a significant peak in blood fructose concentration. The conversion of adsorbed fructose into glycogen in the liver occurs independently of the hormone insulin. Experiences have shown that foods sweetened with fructose produce faster and longer lasting satiety effects than foods sweetened with other sweeteners.

Inulin preparations from chicory roots exhibit a pronounced hypoglycemic effect in patients with non-insulin dependent diabetes mellitus (type 2), and also reduce daily fluctuations in blood glucose levels (P. M. Pavlyuk, 1999; O. Yu. Kosykh, 2000). Therefore, chicory inulin is considered today as the drug of choice in the treatment of patients with type 2 diabetes mellitus. It is recommended as monotherapy for newly diagnosed diabetes and mild disease, as well as for the primary prevention of diabetes mellitus in people with reduced glucose tolerance syndrome and metabolic syndrome (impaired carbohydrate metabolism, hypertension, hyperproteinemia). In moderate and severe forms of diabetes mellitus, inulin allows to reduce the dose of basic hypoglycemic drugs, is a good means of preventing complications of the disease (diabetic angiopathies, peripheral neuropathies, retinopathies, nephropathies and encephalopathies). In addition, inulin has a beneficial effect on

lipid metabolism, reducing the elevated level of cholesterol and triglycerides in the blood (P. M. Pavlyuk, 1999). Thanks to the satiety effect, inulin reduces hunger without consuming additional calories.

With this pathology, along with disorders of all types of metabolism in diabetes, the metabolism of trace elements changes significantly. So, with the development of carbon imbalance, the processes of removing iron, copper, zinc, cobalt, and chromium from the body are activated. It has been proven that chromium atoms act as an activator of interaction between insulin molecules and surface membranes of cells, and copper and manganese regulate glucose uptake, being direct or indirect activators of tissue respiration, therefore, a decrease in their content negatively affects the condition of patients with diabetes mellitus (G.A. Babenko , I.P. Reshetkina, 1971). When studying the trace element composition of chicory roots, it was found that the underground part of the plant contains, in particular, iron, copper, zinc and chromium. Therefore, it is obvious that the consumption of chicory is very useful for the prevention and complex treatment of diabetes mellitus.

Salad and root varieties of chicory are used in the diet of patients with diabetes (N. Umikov, 1938; V. I. Formazyuk, 2003). The use of liquid chicory extract in 70 % alcohol in a 1: 1 ratio at the initial stages of diabetes has a therapeutic effect, and at later stages and in advanced cases it improves health and reduces the sugar content in urine (I.A. 1970). Infusion and decoction of common chicory roots are used in traditional medicine in a number of countries of the world (Ukraine, Belarus, Azerbaijan, etc.).

The nutritional value. Due to the presence of easily digestible substances, chicory root is a valuable food product (NS Fursa et al., 1999). Roasted chicory roots are used as a substitute for coffee and as an admixture to natural coffee. Chicory drink has a pleasant taste and smell. It is especially recommended for those who are contraindicated in natural coffee. Chicory salads are a valuable dietary product; in they contain ascorbic acid, carbohydrates and other nutrients, but they are not among the herbs, as their composition is not part

of the substances that determine the medicinal value of wild chicory.

Contraindications to the use of chicory are due to the fact that this plant, like coffee, artificially excites the nervous system, causing jumps in blood pressure and increased heart rate. People suffering from vascular, heart or nervous system diseases should refrain from eating chicory products.

Application form

• Infusion: (1-2 teaspoons of crushed root in a glass of boiling water), taken orally *1/2* cup before meals.

• Infusion for external use: 3-4 tablespoons of herbs for 2 cups of boiling water.

Rp. Inf. rad. Cichorii 5.0-200 ml

DS 100 ml 2 times a day before meals.

Kuril tea

Dasifora fructicosa

Kuril tea, or, as it is also called, Potentilla, grows mainly in the Altai Mountains. In addition, Kuril tea can be found in the Caucasus, Central Asia and even China. For a long time, young shoots of this plant with its flowers and leaves have been used for medicinal purposes. Kuril tea is a rather beautiful plant that can decorate any home garden. All parts of the plant (flowers, leaves and shoots) are rich in substances such as tannin, flavonoids, catechins. The aerial part of the plant (especially the leaves) contains the following trace elements: potassium, iron, calcium, magnesium, manganese, cobalt, copper, which are important for patients with diabetes.

A distinctive feature of Kuril tea is the fact that it contains 5 times more vitamin C than lemon. In addition, Kuril tea contains carotenoids and P-active substances. Carotenoids are pigments that are rarely found in plants.

Therapeutic action. Together with the St. Petersburg Chemical-Pharmaceutical Academy, scientists from the Institute of Organic Chemistry of the SB RAS are developing a hypoglycemic drug - an extract of Kuril tea. It is used not only to treat diabetes mellitus, but also as a desensitizing agent. It is supposed to release this medication in the form of tablets.

In case of individual intolerance, the use of this tool is not recommended.

Common blueberry
Vaccinium myrtillum L

Perennial shrub of the lingonberry family. Blueberry leaves and berries contain up to 10 % tannins, glucoside myrtillin, which lowers blood and urine sugar levels. Pterostilbene is found in blueberries, cranberries, grapes, and lingonberries.

Therapeutic action. Pterostilbene, a natural antioxidant found in blueberries, helps lower blood cholesterol levels. Blueberries and other plants of the lingonberry family have a pronounced hypoglycemic effect. This was found with the simultaneous administration of an alcoholic extract from blueberry leaves to rabbits at a dose of 1 ml / kg (V.V.Solovyova, L.F. Perova, 1961; A.D. Turova, 1967). Long-term administration of preparations from bilberry leaves in the pancreas increased the number of pancreatic islets (M. Mahoux, 1960). The glycoside neomyrtillin, contained in blueberry leaves, has the ability to lower blood glucose.

Bilberry anthocyanosides have versatile biological activity and extremely low toxicity. Bilberry anthocyanosides (1–2 %) promote the regeneration of the light-sensitive retinal pigment - rhodopsin and thus improve the sensitivity of the retina to different levels of light radiation, enhance visual acuity in low light, reduce eye fatigue during prolonged work and artificial light.

They stabilize connective tissue by strengthening the walls of blood vessels.

They are powerful antioxidants that protect cell membranes from free radicals.

Prevents the development of inflammation and blood clots.

Accelerate the regeneration of rhodopsin and activate retinal enzymes.

Replenish substances and microstructures utilized in the process of light and color perception.

Experimental data indicate a beneficial effect of blueberries on the tissue structures of the retina. Anthocyanins are also found in the fruits of the chokeberry.

Flavonoids (rutin, quercetin, vitamin P) contained in blueberries have a capillary-strengthening effect on the human body and reduce the permeability of the blood-parenchymal barriers, stimulate the process of protein biosynthesis. This action underlies the pharmacological, prophylactic and therapeutic effects of these compounds (anti-inflammatory, desensitizing) in diabetic, hypertensive, atherosclerotic retinopathy.

The plant reduces sugar levels, enhances vision (especially night vision), activates intestinal motility, increases efficiency, and reduces fatigue. The leaves are harvested during the flowering period (May - June), and the berries are harvested in August - September.

Contraindications: constipation, nephrolithiasis, oxaluria, hypersensitivity to blueberries.

Application form

• Infusion: 60 g of chopped blueberry leaves pour 600 ml of water, boil and drink 1/2 cup 4 times a day before meals.

• Broth: 1 tablespoon of ripe berries, pour 1 glass of boiling water and boil with the lid closed for 1-2 minutes. Insist 1 hour. Take 1 glass 3 times a day after meals.

• "Yastrebinka" (Belarus) - dietary supplement containing blueberries, strawberry herb and carrot juice concentrate.

• "Mirtilene Forte" - dietary supplement containing dry extract of blueberries, soybean oil.

Prickly blackhead

Poterium spinosum L

Perennial herb of the Rosaceae family. Of all the studied medicinal substances, the greatest hypoglycemic effect was exerted by lossoside - triterpene saponin isolated from the polygamous and hairy blackheads (D. Shukurov, 1981), which is recommended as an effective antidiabetic agent. Residents of Siberia take a decoction of prickly blackhead root with diabetes. At the same time, for several months, the symptoms of diabetes completely disappear even without dieting (A. Kuzbari, 1962; MI Aidikov et al., 1976; D. Shukurov, 1981). An infusion of stems and roots, as well as an alcoholic extract of prickly blackhead, reduced the amount of glucose in the blood of rabbits that were not given a glucose load. Taking a decoction of the bark and roots of blackhead polygamous and hairy-fruited once a day for 40 days eliminated all the symptoms of diabetes, reducing blood sugar levels by more

than 20 %. The introduction of a 10 % infusion of leaves of blackhead fluffy, polygamous, burnetae significantly reduced the amount of sugar in the blood and increased the deposition of glycogen in the liver, myocardium of intact rabbits and rabbits with alloxan diabetes.

Edible lentils

Lens culinaris Medis

Perennial herb of the legume family. Lentil protein contains amino acids that are essential for our body (for example, lecithin). Lentil dishes provide us with essential vitamins and minerals that are fully digestible. Lentils are the record holder for the content of folic acid and iron (V. I. Formazyuk).

Therapeutic action. Lentils contain a large number of isoflavones, which are phytoestrogens known for their beneficial properties. Isoflavones help with osteoporosis, climacteric syndrome and have metabolic and anticarcinogenic properties, as well as have a beneficial effect on the condition of the skin and the functioning of the cardiovascular system. They have hypoglycemic properties and are used in the treatment of patients with diabetes (EI Likhtenstein et al., 1948; V. I. Formazyuk, 2003). Lentils may help reduce the risk of complications in type 2 diabetes, according to Canadian researchers at St. Michael's Hospital and the University of Toronto.

Nutritional value. The introduction of salads from lentils, lentil soups and cereals into the diet allows you to normalize the blood sugar level in patients with diabetes mellitus. Lentil puree is useful for digestive diseases (colitis, ulcers, etc.).

Contraindications to the use of lentils are the following diseases: gout, uric acid diathesis, joint diseases.

Common champignon
Agaricus campester L

The cap is 3–8 cm in diameter, at first hemispherical, then flat-convex, dry, silky-fibrous, sometimes fine-scaly on the tubercle, white, sometimes light yellowish-brownish. The plates are loose, frequent, thin, easily detached from the pulp, at first pink, then almost black. Spore powder, black-brown. Leg 2–6 cm long, 1–2 cm thick, smooth, longitudinally fibrous, white, with a white filmy ring. The pulp is tender, white, slightly pink in the cut. The taste is insipid. Champignon contains proteins, carbohydrates, vitamins PP, E, D, B vitamins, iron, phosphorus, potassium, zinc (V.F.Korsun et al., 2012).

Therapeutic action. Due to their low sodium content, they are suitable for salt-free diets and diabetes. Champignons are mushrooms that have a beneficial effect on diabetics, they effectively lower blood sugar levels. The use of champignons lies in the easy digestibility of this food product. The presence of amino acids necessary for a person suffering from diabetes also confirms the need to use champignons in food. There are a lot of potassium, magnesium, phosphorus, linoleic acid in these mushrooms. Cooking champignons with vegetables is considered an excellent combination. Folic acid, vitamins B, C, D contained in mushrooms are in harmony with a significant amount of vegetable fiber. It is known that mushroom powders have bactericidal properties, and homeopathic doctors use them in the treatment of diabetes. In India, the drug campestrin was obtained from the culture of young champignons. Campestrin is an antibiotic that strongly inhibits the growth of Staphylococcus aureus and is active against the causative agents of typhoid and paratyphoid fever. The antibiotic agaridoxin was obtained from the fruit bodies of the common champignon, which has a detrimental effect on pathogens.

Nutritional value. It is used boiled, fried, pickled, suitable for freezing. Champignons contain flavoring and aromatic extractives that cause abundant secretion of digestive juices in the human body, mushrooms stimulate appetite and improve the digestibility of all food intake, promote metabolism.

It is not recommended to eat mushrooms for people with illnesses that require light food.

Mulberry white, black

White mulberry, Morus alba L., Morus. nigra L

A fruit tree of the mulberry family. Mulberry is widespread in Central Asia, Russia, Ukraine and other countries. The berries come in different colors, ranging in size from 1 to 5 cm, similar to raspberries or blackberries. They contain many useful substances: sugars, acids (citric and malic), fat, vitamins, iron, pectin, tannins, ash substances. The set of macro- and microelements contained in mulberry includes calcium, phosphorus, potassium, sodium and magnesium, manganese, selenium, iron, zinc and copper. In addition, berries are high in resveratrol, a powerful plant antioxidant. In the seedlings of black mulberry, iron is almost 2 times more (about 6.3 %) than in white mulberry (V. I. Formazyuk, 2003).

Therapeutic action. Mentions about the mulberry tree can be found in the Bible. Tradition says that in Jericho even today you can see the mulberry, under which Jesus Christ was hiding. In traditional medicine, a number of Balkan and Central Asian countries are used for diabetes. The antidiabetic effect may depend on the presence of vitamins in mulberry fruits, mainly riboflavin or tannins (SM Kit, 1972; M. Leclair et al., 1960; A. N. Borisenko, 1962; L. A. Lapynina, 1965).

With diabetes, mulberries help to lower blood sugar levels and improve well-being, since vitamin B2 retains glucose in the tissues. In China, mulberry leaves are also used for diabetes. 2-3 tablespoons of raw materials are poured with 1 glass of boiling water, boiled for five minutes, insisted for an hour, filtered. Drink 1/3 tablespoon 3-4 times a day. The course is 2.5–3 months. The break is a month. Repeat 3-4 times. Long-term administration of preparations from mulberry leaves in the pancreas increased the number of pancreatic islets (M. Mahoux, 1960). Unfortunately, the positive effect of mulberry may not appear in all cases, it can be very limited and short-lived. Therefore, mulberry, like a number of other plants with antidiabetic activity, can be used for mild diabetes or as an additional drug on the recommendation of the attending physician.

Nutritional value. Adults and children love to feast on mulberries. Usually they are eaten fresh. Berries are also suitable for filling in pies and sweet dumplings. Juice is obtained from mulberries, jelly and compotes are boiled, vodka and wine are made. Mulberry is suitable for preservation, jam and syrup are made from it, jam, marshmallow and sorbet are prepared. Dried berry powder is used in baked goods. From the squeezed fruit juice by evaporation, a syrup is prepared - bekmez or dushab, which tastes like honey and preserves the valuable nutrients of fresh juice in a concentrated form.

After taking fresh mulberries, you should not drink cold water. Otherwise, rumbling, bloating, and often diarrhea occur. Diabetics and hypertensive patients should not eat a large number of sweet mulberry varieties. In diabetics, the blood sugar content increases, in hypertensive patients, especially in hot weather, blood pressure may rise.

Application form

• Take equal amounts of mulberry and blueberry leaves, corn stigmas, galega grass, and bean pods. Mix all the

ingredients thoroughly, pour 1 tablespoon of the resulting mixture with 1 cup of boiled water for 2 hours, after which we drink it in 2-3 doses.

Rosehip cinnamon (rose)
Rosa cinnamomea L., Cinnamon rose

Deciduous shrub with reddish-brown shiny branches of the Rosaceae family. It grows almost throughout the European part of Russia, in Siberia. It grows in river floodplains, in meadows, in sparse forests, on forest edges, clearings, clearings, among thickets of bushes, in ravines. Diluted as an ornamental and as a medicinal plant. For medical purposes, fruits are used (16 species of rose hips - GF XI ed., 1989).

As medicinal raw materials, fruits are used that contain ascorbic acid up to 5.2 %, carotenoids, alpha, beta, and gamma carotenes, lycopene, phytofluin, cryptoxanthin, etc .; vitamins B2, K, P, E; flavonoids: quercetin, kaempferol, isoquercetin, anthocyanins, fatty oil, sugars, pectin and tannins, organic acids, etc. (Encyclopedic Dictionary, 1999).

Therapeutic action. The medicinal use of fruits, leaves, flowers and roots of wild rose has been known for a very long time. Avicenna recommended them for noise in the head and for toothache, for swelling in the throat and inflammation of the tonsils. He believed that rose hips would stop vomiting and soothe hiccups. In the domestic medical encyclopedia “The Verb Book Cool Vertograd” it says: “The color is free-spirited. the stoma (stomach) will take out. ” In the Moscow State, the Pharmaceutical Order, organized in the 17th century, was one of the first to include “svoborin fruits” in the plan of state procurements. To maintain their strength, the exhausted patients and the wounded were given “syrupy syrup”.

The berries of this plant for centuries in various variations are actively used in the practices of traditional medicine specifically for the treatment of diabetes mellitus and related diseases.

Rosehip preparations have a variety of pharmacological activity, which depends mainly on the content of a complex of vitamins in the plant (multivitamin, anti-inflammatory, choleretic, capillary-strengthening, hemostatic, diuretic, hypocholesterolemic). They improve digestion, increase redox processes in the body, participate in the oxidative deamination of aromatic amino acids, activate a number of enzyme systems, stimulate the body's resistance to harmful environmental influences, infections and other unfavorable factors, enhance tissue regeneration, hormone synthesis, and have a beneficial effect on carbohydrate exchange.

According to scientists at Lund University, daily regular doses of rosehip extract help to significantly lower blood pressure and cholesterol levels, work as a fundamental prevention of all kinds of cardiovascular diseases, and have a serious healing effect in diabetes. In particular, in the course of the study, the fact of a noticeable decrease in blood pressure, an improvement in the general health of patients with diabetes mellitus, as well as those suffering from overweight, was recorded. For six weeks of treatment each of them was given special drinks based on rose hips (www.diabetikam.ru). The experiments of Swedish scientists have shown that in the case of daily consumption of drinks based on rosehip, the rate of development of type 2 diabetes is sharply reduced. As part of the experiment, a group of experimental volunteers ate rose hips daily for six weeks, after which they regularly drank decoctions based on apples and grapes for another six weeks. After each period, specialists recorded their body weight, blood pressure and fat levels, and also checked changes in glucose tolerance, which allows the identification of diabetes in the early stages.

At present, oil extracts from wild rose (rosehip seed oil and oil extract from fruits - "Carotolin") are being actively studied. Rosehip oil has a wound-healing effect, it contains unsaturated and saturated fatty acids, carotenoids and tocopherols, which normalize carbohydrate metabolism and increase the body's defenses. Rosehip fruits are useful for patients with diabetes mellitus to enhance physical and mental performance, relieve fatigue and fatigue. It is used internally

and as an adjuvant in the treatment of patients with diabetes (Yu. A. Zakharov, V. F. Korsun, 1999). It is also used for chronic cholecystitis, post-traumatic eczema, pressure sores and diabetic foot.

Be sure to rinse your mouth with plain or soda water after ingestion of the rosehip infusion, because the acids in the infusion spoil the enamel of the teeth. Rosehip in large doses due to the high content of vitamin K is contraindicated in thrombophlebitis, endocarditis and III degree heart failure. Due to the high content of vitamin C, it is contraindicated in gastric ulcer and duodenal ulcer, gastritis with high acidity. With prolonged use of rosehips in large doses, it is possible to suppress the insular apparatus of the pancreas and withdrawal syndrome. Rosehip syrup causes bloating and rumbling in the stomach, then it should be combined with dill, parsley or celery. Alcoholic berry tincture increases blood pressure, and water extract reduces. The decoction of the roots reduces the separation of bile, can cause constipation, is contraindicated in hypertension. The fruits contain significant amounts of inositol, which has a laxative effect.

Application form

• Infusion of fruits 10.0: 200.0 1/2 cup 2 times a day after meals.

• Holosas - syrup prepared with condensed rosehip extract and sugar; thick, syrupy liquid of dark brown color, sweet and sour taste, peculiar smell. Assign to adults 1 teaspoon 2-3 times a day; children 1 / 4-1 / 2 teaspoon.

• Rosehip oil for oral administration, 0.5 teaspoon 2 times a day.

• Rosehip syrup.

Rp. Inf. fruct. Rosae 10.0-200 ml

DS 100 ml 2 times a day after meals.

Rp. Cholosasi 200 ml

DS One teaspoon 3 times a day.

Rp. Ol. Rosae 100 ml

DS 1/2 teaspoon 2 times a day.

Spinach garden
Spinacea oleracea L

It is an annual herb of the family of haemata. Does not occur in the wild. Homeland - Southwest Asia. Introduced into culture relatively recently, it appeared in Russia in the middle of the 18th century. The plant tolerates both cold and drought well. Spinach is an accumulator of many valuable physiological active substances. It contains rutin, vitamins B1, B2, C, P, calcium and iron salts, folic acid, carotene. Protein in it is up to 34 % - this is one and a half times more than in milk powder, twice as much as in cabbage, wheat flour is three times higher in this indicator (V. I. Formazyuk, 2003).

Therapeutic and dietary action. Spinach is a valuable food item for people with anemia. For healthy people, spinach is also very beneficial, especially for children and adolescents. Its consumption contributes to an increase in hemoglobin and an increase in the number of red blood cells, replenishment of vitamins and minerals, and an increase in the body's resistance to infectious diseases.

Spinach is used for diseases of the nervous system, anemia, hypertension, tuberculosis, diabetes mellitus, overwork, rickets, growth disorders in children. Fresh juice from the leaves and spinach infusion are used to normalize carbohydrate metabolism (D. Shukurov, 1981; V. I. Formazyuk, 2003). They stimulate the intestines with a mild laxative effect and slow down cell aging.

Spinach prevents retinal detachment, strengthens blood vessels, and improves the activity of the pancreas. Indicated for people with impaired health. It is well absorbed.

It is undesirable to use spinach for kidney stones, nephritis, gout, liver, gallbladder and duodenal diseases.

Eucalyptus globular
Eucalyptus globulus L

Evergreen tree up to 60–80 m high, myrtle family (Myrtaceae). Grows in the Caucasus and southern Ukraine. For medicinal purposes, eucalyptus leaves are harvested. The leaves of all three types of eucalyptus (spherical, rod-shaped, ash) contain an essential oil consisting of various terpene compounds, in particular from cineole and pinene, as well as organic acids, tannins, bitter and other substances (S. Ya. Sokolov, 2000).

Therapeutic action. Eucalyptus leaf preparations have a pronounced antiseptic and anti-inflammatory effect. They are active against gram-positive, gram-negative microorganisms, have a detrimental effect on fungi and protozoa. Eucalyptus inhibits the growth of Staphylococcus aureus, Escherichia, mycobacterium tuberculosis, dysentery amoeba and Trichomonas. Galenic forms from eucalyptus leaves are used as antiseptic and anti-inflammatory agents. They are used for rinsing, inhalation, preparation of wet tampons, lotions. Infusions and decoctions of eucalyptus leaves are prescribed for abscesses, phlegmon, diabetic foot, sluggish infected chronic ulcers. Extracts from this plant have hypoglycemic properties (SG Genes, 1962). Currently, there are irrefutable facts confirming the hypoglycemic effect of some essential oils. Eucalyptus essential oil has the most active hypoglycemic effect. The appointment of eucalyptus oil by mouth is possible only if there is a control of blood sugar levels at home using a

portable glucometer and after a patient with diabetes has gone through a diabetic school. In this case, it is necessary to notify either the observing patient endocrinologist or the therapist, since the use of eucalyptus oil may require a decrease in doses of insulin and antihyperglycemic agents.

Small doses of 1 to 2 drops per day after meals are prescribed. It can be taken in a bread or gelatin capsule. It is necessary to start taking eucalyptus oil with 1 drop, gradually selecting the required dose and at the same time controlling the blood sugar level.

The course of taking eucalyptus oil is 3 weeks (21 days), after which it is necessary to take a break from taking it, controlling the blood sugar level. Then continue taking the essential oil. The use of eucalyptus essential oil implies its long-term use, which can lead to the abolition of hypoglycemic agents in moderate diabetes or a decrease in insulin doses in severe diabetes.

In the treatment of diabetes mellitus, one should always strive for the maximum possible compensation of the disease and the normalization of blood and urine sugar levels. When treating diabetes mellitus, one should strive to keep blood sugar at the normal level with a mild course of 4.5–5 mmol / l, and with moderate severity, try to bring it to 6–6.5 mmol / l.

The use of eucalyptus preparations during pregnancy and breastfeeding is prohibited. One should not achieve a significant decrease in blood sugar levels in patients with severe diabetes mellitus, since they are adapted to high sugar levels and a sharp decrease in it will lead to a worsening of the patient’s condition.

Application form

• Tincture of eucalyptus 1: 5 in 70 % alcohol.

• Broth: 15 g of dry eucalyptus leaves pour 100 ml of water. Cook for 3-4 minutes, filter through a gauze cloth. It is

used as a disinfectant and wound healing agent. 1-2 cups of eucalyptus broth should be diluted in 1 liter of water.

• Oil: for inhalation, add 15–20 drops of eucalyptus oil to 1 glass of hot water.

• Chlorophyllipt contains a mixture of chlorophylls found in eucalyptus leaves. The drug has antibacterial activity, is used topically in the treatment of burns and trophic ulcers (the original 1 % alcohol solution is diluted in a ratio of 1: 5 in a 0.25 % solution of novocaine).

Eleutherococcus (freeberry prickly)

Eleutherococcum senticosus (Rupr. Et Maxim.)

Strongly thorny shrub up to 4 m high of the Araliaceae family. Grows in cedar-deciduous forests. Found in the Far East and Primorye. Medicinal raw materials are pieces of rhizomes and roots. They contain eleutheroside A, B, C, D, E, fatty and essential oils, microelements: selenium, strontium, barium, coumarin derivatives, etc. (IV Dardymov, 1976).

Therapeutic action. The school of one of the greatest Russian pharmacologists, N.V. Lazarev, investigated various aspects of the adaptogenic action of the eleutherococcus root extract. Its antitoxic, antineurotic, tonic and anabolic properties have been proven. Suffering from diabetes mellitus, it is also useful to take an extract of Eleutherococcus, 15–20 drops in the morning and at lunchtime.

Studies carried out on models of alloxan diabetes by K.A. Meshcherskaya (1962), and later by G.N.Bezdetko (1966, 1973), showed that the use of an extract of Eleutherococcus leads to a significant mitigation of the symptoms of the disease: a decrease in sugar levels in blood and urine, increasing the survival rate of animals. According to the experimental data of K. A. Meshcherskaya, the introduction of preparations of eleutherococcus roots, in

particular its extract, into the organism of animals (64 adult rats) after 24–48 hours leads to the fact that sugar in blood and urine is significantly reduced. The experiments were carried out against the background of experimental diabetes in rats, caused by the introduction of a 5 % solution of alloxan at the rate of 200, 150 and 100 mg per 1 kg of animal weight.

In rodents with a genetic predisposition to type 2 diabetes, stress clearly causes this disease. Adaptogens, agents that mitigate the stress response, also prevent the so-called alloxan diabetes in rats (laboratory version of diabetes) caused by the drug alloxan, which damages the beta cells of the pancreas that produce insulin (I.V. Dardymov, 1976). Research on stress as a cause of diabetes in humans is insufficient to make definitive conclusions. Yet there is no question that stress exacerbates existing diabetes.

Stress has a profound effect on metabolism and, in particular, on the utilization of glucose in the body. Stress hormones, especially cortisol, decrease the insulin reactivity of most tissues, reducing their glucose intake. This contributes to an increase in its level in the blood, and more fuel becomes available for the nervous system, which, according to I.N. Todorov and G.I. Todorov (2003), does not need insulin to produce glucose. It is clear that stress is the most common and widespread cause of hyperglycemic crises and the most important factor in complicating pre-existing diabetes.

The study of the effect of ginseng and eleutherococcus extracts on carbohydrate metabolism is the subject of the works of I.V. Dardymov (1976). In experiments on a model of alloxan diabetes, pronounced antidiabetic properties of both the extract from the root of Eleutherococcus and the sum of eleutherosides were revealed, and the protective effect was observed with therapeutic and especially with prophylactic administration of drugs. In biochemical studies, it has been proven that in the antidiabetic action of ginseng and eleutherococcus, an essential role is played by their property to prevent the inhibitory effect of diabetic lipoprotein on the penetration of glucose through membranes into cells and its phosphorylation. To date, the clinic has also obtained positive results in the treatment of patients with diabetes mellitus using

extracts of ginseng and eleutherococcus, especially in the initial stages of the disease (N.N. Chernoyarova et al., 1958; E.D. Mishchenko, 1962). Improvement of immediate and long-term results of treatment of patients with diabetes mellitus was also observed by clinicians who used as an adaptogen, along with an extract of Eleutherococcus, also extracts of Leuzea and Rhodiola (L. F. Kolmakova, L. I. Kutolina, 1966, etc.).

Preparations based on Eleutherococcus should not be used if you have a high fever, an acute period of infection or other illness, as well as a severe form of hypertension and insomnia.

Application form

• Tincture. 50 g of crushed leaves and roots of the plant pour 0.5 liters of vodka or 70 % alcohol and leave in a dark and warm place for 14 days. Strain. Take 20-40 drops 3 times a day 30 minutes before meals. At home, tincture of Eleutherococcus is prepared with 70 % alcohol: 200 g of crushed rhizomes and leaves in a 1: 1 ratio per 1 liter of alcohol. Store in a dark place. Ready-made tincture is sold in pharmacies. Infusion of leaves and roots. 1 teaspoon of chopped collection (leaves and roots in a ratio of 1: 1) pour a glass of boiling water, boil in a water bath for 15 minutes, cool for 45 minutes at room temperature, strain, squeeze. Top up with boiled water to 200 ml and drink 1-2 tablespoons 3 times a day before meals.

• Powder from leaves of Eleutherococcus in folk medicine of Primorye and Amur region is used for sprinkling both fresh and long-lasting wounds with diabetic foot. This accelerates tissue epithelialization and stimulates rapid healing.

• The extract of Eleutherococcus liquid is prepared with 40 % alcohol in a 1: 1 ratio. Take 25-30 drops half an hour before meals.

Rp: Extr. Eleutheroccoci fluidi 50 ml

DS 1–20 drops in the morning and afternoon.

Echinacea purpurea

Echinacea purpurea L., Coneflower

Perennial herb up to 100 cm high of the Asteraceae family. The root system is represented by a rhizome, turning into a highly branched root. Leaves are petiolate, serrated along the edge. The flowers are collected in large baskets, light or dark purple. Blooms in the second year of life. The plant was introduced in Russia as a medicinal and ornamental plant (called rudbeckia). Herbs, roots and rhizomes are used as medicinal raw materials. The herb contains polysaccharides (heteroxylans and arabinoramnogalactans), essential oil, flavonoids, oxycinnamic acids (chicic, ferulic, coumaric, coffee), tannins, saponins, polyamides echinacin, echinolone, echinocoside; phytosterols, organic acids and resins. The roots are rich in inulin, glucose, essential and fatty oils, phenolcarboxylic acids, betaine, and resins (Encyclopedic Dictionary, 1999). The whole plant also contains enzymes, trace elements (selenium, cobalt, silver, molybdenum, zinc, manganese, etc.).

Therapeutic action. On the basis of Echinacea purpurea, over two hundred drugs have been created in many countries. Used as an antiseptic, antiviral, immunomodulatory agent in the form of various (more than 30 drugs) dosage forms (extracts, tinctures, tablets, decoctions, dietary supplements).

When taking echinacea preparations associated with metabolic disorders (diabetes mellitus), exposure to various chemical compounds of a toxic nature contained in the air and food (heavy metals, pesticides, insecticides, fungicides),

stimulation of the immune system is observed (V.F. Korsun, E. V. Korsun, 2008).

As an antiseptic, it is used for various infectious diseases. Echinacea preparations are also used as immunomodulators. In a clinical setting, the drugs are used in the treatment of leukopenia caused by radiation and cytostatics during polychemotherapy for oncological diseases of the digestive tract, as well as for bedsores, diabetic foot and trophic ulcers. They have immunomodulatory, anti-inflammatory, antiviral, antibacterial, antiseptic effects. Echinacea extracts inhibit the growth and reproduction of streptococcus, staphylococcus, Escherichia coli, influenza viruses, herpes, stomatitis. Echinacea stimulates lymphocyte production, phagocytosis, macrophage and interferon production. In the treatment of diabetes mellitus, it can be used as an additional agent. All types of echinacea are used in homeopathy.

Hypersensitivity (including to plants of the Asteraceae family), progressive systemic and autoimmune diseases, including tuberculosis, leukemia, collagenosis, HIV infection or AIDS, multiple sclerosis, generalized atherosclerosis.

Application form

• Estifan - dry extract from the herb Echinacea purpurea in tablets.

• Decoction of roots in a dose of 5 g per 200 ml of water for taking 100 ml 2 times a day.

• Immunal - alcohol tincture of plant roots for oral administration.

• Echinacea-VILAR - juice of fresh herb Echinacea purpurea in 20 % ethyl alcohol to be taken 30 drops 3-4 times a day after meals with a little water.

Rp. Tabul. Estyphani No. 30

DS 1 tablet in the morning and in the afternoon before meals.

Rp. Dec. rad. Echinaceae 2.0-200 ml

DS 2 tablespoons in the morning and afternoon.

Rp. Immunali 25 ml

DS 10 drops in the morning and afternoon before meals.

Yucca

Yucca filamentosa

From the euphorbia family. Other names: cassava, cassava, Adam's needles, garden of swords, soap tree, beer root, and bread root. Yucca grows as a bush or false palm tree with a woody trunk. Reaches at home and in places of wide distribution in its growth up to 12 m. The leaves of this tree are large (up to 1 m long), hard, linear. Yucca leaves serve as an industrial raw material for the production of steroidal saponins, which are further used for the synthesis of hormonal products.

The yucca root has a high content of steroids saponins, which stimulate the production of cortisone in the body and are responsible for the anti-inflammatory qualities of the plant. Yucca saponin extract does not possess cumulative and sensitizing effects. Due to their low toxicity, the substances are not subject to standardization (MUK 4.1.2252–07). In addition to vitamin C, yucca root contains two more vitamins with good antioxidant properties: vitamin A (27 IU) and vitamin E (0.4 mg). B vitamins are widely represented: folic acid, thiamine, niacin, riboflavin and pantothenic acid. Yucca root contains the polyphenol resveratrol, a natural phytoalexin (plant protective chemical) with pronounced antioxidant

properties. Resveratrol protects the body from damage caused by oxidation and subsequent free radicals.

Scientists have found that yucca extract has significant hypoglycemic activity and helps to lower blood glucose levels in diabetic animals. The corresponding study was published in the journal Diabetes and its Complications (September - October 2008). Dr. James A. Herzog, author of The Green Pharmacy, recalls that Native Americans used yucca to treat diabetes and lower blood sugar. It is time to think about the benefits of this plant and modern man. The recommended intake of this remedy is 2 g in capsule form (extract as part of a dietary supplement) or 7 g of root.

The root crop contains poisonous glycosides, therefore, before use, it is treated in a special way: it is dried, soaked and fermented.

Common barley
Hordeum vulgare L

An annual herbaceous cultivated plant of the cereal family. Grain is used, which contains proteins, carbohydrates, fats, fiber, enzymes, vitamins A, E, D and group B (V. I. Formazyuk, 2003).

Therapeutic action. The medicinal properties of barley have been known for a long time. In Russian herbalists of the 19th century, we find recommendations on the use of barley grain and products derived from it. “Barley broth is useful in severe biliary diseases. He multiplies milk from nurses, especially if you put a little dill in it; very good at consumption, because it is nutritious, cooks easily in the stomach and does not produce winds in the stomach. Barley broth cools, softens, cleanses and opens the path. Especially useful for sore throat. A decoction of pearl barley softens, accompanies sleep, drives out a lot of phlegm. Barley coffee is

very nutritious, tasty and so healthy for the breast that many people have cured of consumption alone without resorting to any other medicine. “

Barley preparations have enveloping and emollient properties, mild diuretic and anti-inflammatory effects. Barley is useful in treating complications of diabetes such as stomach diseases, edema, vascular diseases and mineral imbalances in the body. A decoction of barley and pearl barley is used in inflammatory diseases of the stomach and intestines, as well as as a general tonic in diabetes mellitus, after surgical interventions on the abdominal organs and to reduce cough. Barley porridge and soups are indicated for overweight people. The fiber contained in cereals irritates the intestinal mucosa and enhances the movement of food, reducing its absorption. Barley malt is recommended in traditional medicine for inflammation of the bladder and pyelonephritis as a diuretic and anti-inflammatory agent. The enzymes contained in malt contribute to better food digestion (V. I. Formazyuk, 2003).

There is information in the literature that alcoholic extracts from barley seeds containing flavones actively inhibit the mitotic activity of cells.

Nutritional value. Modern nutritionists also value barley quite highly. Barley is widely used for the preparation of cereals, in brewing, for the preparation of malt, etc.

The use of germinated barley can cause increased gas production, therefore, its abuse is not recommended for people suffering from flatulence, and is also contraindicated in case of exacerbation of diseases of the gastrointestinal tract.

Application form

• A decoction of 20 g of cereals per 1 glass of boiling water for taking 1 tablespoon 3 times a day.

• Malt is prepared as follows: the barley grains are dried and ground into powder. Then 2-3 tablespoons are poured into

1 liter of hot water and insisted. Take 250 ml per day. Malt cannot be stored for a long time, as it loses its medicinal properties. It is used for SD (L. D. Shulyatyeva, 1967).

Particular questions of herbal medicine for patients with diabetes mellitus

Diabetes mellitus is an endocrine disease, which is based on absolute or relative insulin deficiency, leading to metabolic disorders and disorders of the main organs and systems of the body. Type 1 diabetes (insulin-dependent) and type 2 diabetes (non-insulin dependent) are conventionally distinguished. With a lack of insulin, the metabolism of carbohydrates, fats, proteins and energy metabolism is disturbed. The main consequences of insulin deficiency are presented in table. 7.

Table 7

Pathogenesis of diabetes mellitus (L. V. Pastushenkov, E. E. Lesiovskaya, 1995)

Along with the new diagnostic criteria for diabetes, experts from the global diabetic community decided to introduce a new classification of diabetes mellitus (WHO, 1999). By etiology, diabetes is conventionally divided into

type 1 diabetes mellitus; 2nd type; other specific types of diabetes associated with:

Genetic defects in β-cell function

Genetic defects in insulin action

Diseases of the exocrine pancreas Endocrinopathies

Diabetes Induced by Drugs or Chemicals

Infections

Unusual forms of immune-mediated diabetes

Other genetic syndromes sometimes associated with diabetes

In some cases, gestational diabetes is diagnosed.

Type 1 diabetes mellitus

This type of disease is based on β-cell destruction, usually leading to absolute insulin deficiency. In subtype 1a, when the onset of diabetes is provoked by viruses (most often herpes viruses, Coxsackie B, adenoviruses), cases of remission after the first severe manifestations of the disease are described. During this period, insulin therapy is not required, but after a few months the disease resumes. Relapse can be triggered by a viral infection, emotional stress, and other factors.

Phytotherapy. Finding and creating new drugs, many researchers drew attention to the existence of some antidiabetic plants and plant compounds in traditional medicine. Patients and doctors are attracted to them by the “softness” of the action, the absence of pronounced side effects and contraindications. They are made from a variety of plants belonging to different families. The forms of antidiabetic drugs - infusions, tinctures, decoctions, syrups - are similar to the forms used to treat other diseases (Table 8).

Table 8

Medicinal plants used in the treatment of diabetes

The goal of herbal medicine is to increase the effectiveness of treatment of patients with diabetes mellitus, increase remission and reduce the frequency of side effects from chemotherapy and complications from the disease, and improve the quality of life.

The main directions of herbal medicine for patients with diabetes mellitus are presented in table. nine.

Table 9

The main directions of herbal medicine for diabetes mellitus

Plants with recommended pharmacological properties

1. Collection of herbs (in parts):

Aralia roots - 2

Horsetail herb - 3

Rose hips - 3

St. John’s wort herb - 2

Chamomile flowers - 2

Lespedeza herb - 4

Galegi grass - 3

Mix. 2 tablespoons of a mixture of herbs pour 400 ml of boiling water, insist in a water bath for 15 minutes, cool for 45 minutes, strain and take 1/3 cup 3 times a day 30 minutes before meals.

2. Leuzea tincture 40 drops in the morning and afternoon before meals.

3. Diacor (dandelion, oregano, St. John's wort, burdock, Jerusalem artichoke, elecampane, calendula, mint, lemon balm, plantain, sophora, galega, nettle, chitosan) 1 tablet 3 times a day 10 minutes before meals.

4. Dikvertin (dihydroquercetin) 2 tablets 3 times a day.

Type 2 diabetes mellitus

From predominant insulin resistance with relative insulin deficiency to predominant secretory defect with or without insulin resistance.

In accordance with the teachings of Ibn Sina (980-1037) about diabetogenesis of diabetes (type 2), it is renal disease resulting from a change in mizaj (nature) to the cold (sour) side. The mistakes of many doctors lie in the fact that they often prescribe lemon fruits rich in acidic acids (*Citrus limon L.*), cinnamon rose hips (*Rosa sinnamomea L.*), sumac tannic (*Rhus coriaria L.*), etc. The effect of lemon juice on prediabetes and insulin resistance has not been experimentally studied to this day.

B. A. Ishankulova et al. (2008) studied the hypoglycemic effect of the collection "Marankhuch". The experiments were carried out on white rats weighing 160–220 g. The infusion of the collection (from the soft and hard parts of hypoglycemic plants of Tajikistan) was prepared in accordance with the requirements of the State Pharmacopoeia of the XI edition and was administered to rats with alloxan diabetes intragastrically for 50 days. Alloxan diabetes was induced by subcutaneous administration of a 10 % solution of alloxanhydrate at a dose of 100 mg / kg of body weight to animals starving for 24 hours. The well-known antidiabetic collection "Arfazetin" was used as a comparative drug.

In alloxan diabetes, on the 7th day, the blood glucose level increased sharply by 31.3 %. On the 15th and 30th days, the glucose concentration decreased, but still remained at a high level (265 %) until the end of the experiments. Under the

influence of the infusion of the collection “Marankhuch” in rats with alloxan diabetes, the level of glucose significantly decreased during all periods of the study. The sugar-lowering effect of the collection “Arfazetin” was slightly inferior to the collection “Marankhuch”, which makes it possible to recommend it to patients with type 2 diabetes mellitus, as well as to patients with certain metabolic syndromes.

At the same time, it is necessary to take sprouted wheat, corn, as well as wheat bran, a decoction of oats with oatmeal. The use of fasting days 1 time per week is necessary for all diabetics, but especially those who are overweight. Greens, vegetables with a carbohydrate content of up to 3-5 %, sour apples, potatoes, beets or carrots soaked in water are used as unloading . A long and strict regimen can cause acidosis and acetonuria, therefore fasting days are used no more than 1 time per week.

The inclusion of earthen pear tubers in the diet is very effective. Regular use of it in the amount of 100–120 g per day can eliminate acetonuria, and an increase in the daily dose to 200 g can normalize blood sugar. The choice - the constant intake of antihyperglycemic agents and insulin or the constant use of earthen pears, other essential food products and medicinal plants, as always, remains with the patient.

The goal of herbal medicine is to improve treatment outcomes and quality of life. The main directions of herbal medicine for type 2 diabetes mellitus are presented in table. ten.

Table 10

The main directions of herbal medicine for patients with type 2 diabetes mellitus

Phytotherapy of diabetes mellitus in children

Children can get diabetes mellitus at any age, starting from infancy and even newborns, but more often children get sick at primary school age. They are characterized by a sharp increase in blood sugar levels. The disease is acute and, without timely treatment, can develop into more severe progressive complications. All this is associated with the intensive growth of the body at this age and increased metabolism (L. I. Shiryaeva, A. M. Pozdnyakov, 2005).

A child may have an increase or, conversely, a loss of appetite, in one case or another, weight loss and weight loss will be noticeable, since in diabetes the virus affects the

pancreas and the release of insulin becomes much less than the norm, without which the body cannot absorb glucose, hence the paradox : although there is a lot of glucose in the blood, and he eats well, the child is losing weight.

The latent period can be very short. Plus, old ailments add nausea, heavy breathing, abdominal pain, vomiting. And without emergency assistance, the child can simply die. The sooner diabetes is recognized in a child, the easier it is to suppress and fight it in the future. When a child begins to drink a lot - this is already a late period, and at an appointment with an endocrinologist after examining the pancreas, the results will show a deterioration in its work, and therefore, a decrease in insulin production, it will not work to protect from diabetes, but you can significantly reduce its effect on health and spending on him the forces of the child's body, which he needs for growth and development.

Phytotherapy. For children, it is recommended to prepare infusions and decoctions in the following daily dose of dry medicinal collection: up to 1 year - 1 / 2-1 teaspoon, from 1 to 3 years - 1 teaspoon, from 3 to 6 years - 1 dessert spoon, from 6 to 10 years old - 1 tablespoon, over 10 years old and adults - 2 tablespoons collection.

Preparation of fees: 2 tablespoons of the pre-chopped (in a coffee grinder or meat grinder) collection, pour 1 liter of boiling water, bring to a boil, simmer for 10 minutes in a sealed container, drain together with the grass into a thermos, leave overnight. Take 100–150 ml during the day 30 minutes before meals. To improve the taste, you can add honey, sugar, jam. The course of treatment is 3-4 months. Then the collection is changed and continuous treatment is continued for 1.5–2 years. Herbal collection can be used in combination with other medicines.

Improvement with herbal medicine occurs after 3-4 weeks of regular intake of herbs. However, a lasting effect can be achieved only in the case of prolonged and regular use of herbs (for 8-12 months or more). Before taking this or that collection, it is advisable to familiarize yourself with the

contraindications to the herbs that make up this collection in the herbalist.

In some cases, the dietary supplement “Tyanshi” helps.

Universal system of complex treatment of diabetes mellitus using dietary supplements “Tyansha”

The first stage is the restoration of disturbed metabolism and microcirculation, an increase in the level of glucose absorption.

Biocalcium to lower blood sugar: 1/2 packet per 250 ml of water, take in the morning 30 minutes before breakfast, in small sips. It is better to use rosehip decoction to comply with the drinking regime.

San-gao: take during the activity of the bladder meridian from 3 pm to 5 pm. Children: 1/2 capsule once a day; adults: 2 capsules 2 times a day.

Uguvan: 2 capsules once a day, best taken in the morning just before breakfast.

Cordyceps: 2 capsules at lunchtime, 1–1.5 hours after a meal, drink 250 ml of water for 7 days, then 3 capsules. Cordyceps is used in the program when there is type 1 insulin-dependent diabetes mellitus.

Biozinc: 3 capsules in the evening, 1.5 hours after dinner, drink 250 ml of water. Heading dose - 1 month 10 days.

The second stage is maintaining normal metabolism and increasing the activity of your own insulin.

Anti-lipid tea: in the morning, an hour before meals, pour 500 ml of boiling water over 1 packet of tea and leave for 15 minutes, drink in small sips during the first half of the day. Re-brew the same packet of tea with 500 ml of water and drink in the afternoon. Reception is contraindicated for children under 12 years of age, pregnant women and nursing mothers.

Icahn: 4 capsules in the morning 30 minutes before breakfast, wash down with 250 ml of water.

Spirulina: 2 pre-crushed tablets 2 times a day, after lunch and dinner after 1.5 hours, wash down with warm rosehip decoction up to 300 ml - within a week, then the dose must be increased to 5 tablets 1 time a day after lunch. Do not use in case of renal disease (renal failure, glomerulonephritis).

Kanli capsules: Take 1 capsule 2 times a day.

The course dose is 50 days.

The duration of the complex treatment system is 3 months. At least 3 courses are held during the year.

Phytocorrection for complications of diabetes mellitus

Increased blood sugar in diabetes mellitus gradually leads to damage to blood vessels and chronic complications specific to diabetes: from the heart, brain, eyes (vision is inexorably deteriorating), kidneys, lower extremities, cardiovascular system, etc. All these numerous complications reduce the quality of life of patients. To a certain extent, all these changes can be smoothed out to some extent, reduced, and sometimes eliminated by using certain herbal preparations.

Distal symmetric polyneuropathy

Damage to the nervous system in diabetes mellitus is divided into non-specific and specific (diabetic). Nonspecific disorders include emotional instability, “volitional” disorders, somewhat unjustified nervousness, headaches, sleep disorders, etc. In addition, especially young people often have a certain

kind of experience with a feeling of some kind of their own inferiority, understanding that the disease cannot be completely cured. All these experiences are quite harmful for people with diabetes. The worries are explained by the fact that under stress fluctuations in blood glucose levels are observed.

Specifically diabetic lesions of the nervous system include diabetic neuropathy. In this state, nerve fibers are not able to transmit information to the brain, which provide a person's perception of this information, the formation of sensations, sensitivity. In such people, the sensitivity may decrease, disappear completely or be perverted.

Diabetic neuropathy (DN) in combination with diabetic angiopathies plays a central role in the development of diabetic foot syndrome (SDS), which "focuses" the most significant late complications of diabetes.

According to modern data, more than 50 % of patients with diabetes develop polyneuropathy. All manifestations of neuropathy are caused by progressive degeneration of sensory and motor nerve fibers. As a result, a disturbance in the conduction of excitation from peripheral nerve fibers arises and gradually increases. The pathogenetic "cascade" leading to the degeneration of nerve fibers is as follows: there is a metabolic disorder in neurons and their axons due to the excess content of intracellular glucose; vascular mechanisms - microangiopathy affecting the *vasa nervosum* (own vessels of the nerves) with ischemia and degeneration of nerve fibers. One should not forget about the genetic predisposition to disorders of glucose metabolism and early onset of polyneuropathy (L.V. Stakhovskaya et al., 2007).

Typical clinical manifestations of diabetic sensory polyneuropathy, as well as neuropathy with impaired glucose tolerance, are symmetrical reduction in pain and vibration sensitivity of the "socks" and "gloves" type, paresthesia, burning shooting pains when touched (allodynia) or when pricked with a needle or spontaneous pain.

Sometimes peripheral polyneuropathy is combined with autonomic (due to damage to autonomic nerve fibers)

polyneuropathy, which, of course, aggravates the patient's condition.

Treatment. Effective pharmacotherapy of DN in the early stages of DFS prevents the progression of DFS symptoms and reduces the need for foot surgery. When discussing the prospects for the development of standards for the treatment of DN, attention should be paid to a drug with high antioxidant and antihypoxic activity. The analysis of the therapeutic effect of the original antioxidant agent "Mexidol" is of particular interest.

In clinical studies of domestic and foreign authors, it was shown that the use of drug therapy in the form of lipoic acid leads to significant clinical improvement and positive changes according to the data of electroneuromyographic examination in the form of an increase in the excitation rate along the studied peripheral nerves compared to the initial (before treatment) level (L . V. Stakhovskaya et al., 2007). In addition, the manifestations of peripheral autonomic failure from the cardiovascular system and the digestive tract are reduced.

For the treatment of painful neuropathy, especially with diabetes, thiogamma (meglumine salt of thioctic acid) is indicated, as well as berlition-300 - thioctic acid.

Phytotherapy. Diabetic neuropathy in patients with type 2 diabetes is detected from the time of the course of the disease, the "older" the disease, the greater the likelihood of this complication. The use of herbs such as calamus, aconite, aloe, barberry, immortelle, poisonous milestones, larkspur, St. John's wort, blackberry, fireweed, clover (red), nettle, lemongrass, mordovan, mint, radish, chamomile, mountain ash, thyme, dog rose and others, with bee products and acupressure with the "Axon-2" device can significantly improve the patient's condition, and in some cases restore the affected tissues. The greatest positive effect is achieved with the internal and external use of herbs and bee products in the form of tinctures, ointments and oils. In addition to this, you can apply water procedures in the form of steam baths and baths. At the same time, harmful substances are removed from

the body, and the condition of the skin will significantly improve (S.F.Klimov, 2010).

Ahmed I., Adeghate E., Cummings E., Sharma AK, Singh J. (2004) studied the therapeutic effect and the mechanism of action of *Momordica charantia* juice in the treatment of streptozotocin-induced diabetes in rats. Diabetes mellitus was associated with significant (p & lt; 0.01) decreases in body weight, blood insulin levels and the number of insulin-positive cells per islet, significant (p & lt; 0.01) increases in blood glucose levels and osmotic properties, increased systolic blood pressure compared to healthy individuals of the same age group. Oral intake of *M. charantia juice in* rats with a streptozotocin model of diabetes mellitus partially *reversed* all diabetes-induced changes. Daily oral intake of *M. charantia* juice in diabetic rats significantly (p & lt; 0.01) reduced Na + and K + -dependent glucose uptake by the brush border of the small intestine mucosa compared to the results obtained in diabetic rats not drinking juice. Both insulin (100MM) and freeze-dried fruit juice extract (5 μg / ml (-1)) can stimulate the uptake of 14C-D-glucose by the L6 muscle tubules. This effect was completely blocked by wortmanin, a phosphatidylinositol-3-kinase inhibitor. High concentrations (10-200 μg / ml *M. charantia* juice extract stopped the absorption of 14C-D-glucose by the L6 muscle tubules, compared with the control group. The effect of treatment with *M. charantia* extract was also tested on disorders of myelinated nerve fibers in the tibial nerve in streptozotocin-diabetic rats The results show that diabetes was associated with a significant (p & lt; 0.05) contraction of weak transverse myelinated nerve fibers, axonal region, myelin region and maximal fiber region Treatment of streptozotocin-diabetic rats with *M. charantia* juice normalized structural peripheral nerve abnormalities The results indicate that *M. charantia* can exert noted healing properties in diabetic rats and, in addition, can regulate glucose absorption by the brush border of the small intestinal mucosa and stimulate glucose absorption by skeletal muscle cells, which is similar to that obtained with insulin administration …

Regardless of the type and origin of polyneuropathy, it is inappropriate to start treatment with the appointment of stimulating drugs. During this period, preference is given to fortifying agents with pronounced vitamin properties - fruits of black currant, rose hips, sea buckthorn, actinidia, irgi, crowberry, cloudberry, mountain ash, chokeberry. drupes, nettle leaves, primrose (Table 11).

Table 11

The main directions of herbal medicine for polyneuropathy

Recommended treatment algorithm

1. Collection from medicinal plants (parts):

Cinnamon rose hips - 4

Rowan berries - 3

Strawberry leaves - 1

Astragalus herb - 4

Maclea Grass - 2

Meadowsweet flowers - 3

Mix. Infusion in a dose of 1 teaspoon of collection per 200 ml of boiling water. Drink during the day before meals. Treatment is 2–4 months.

2. Sanguirithrin 1 tablet 3 times a day after meals.

3. Bath every other day from a composition of essential oils - 1 ml of lemon oil, 2 ml of rosemary and 1 ml of cajaput oil. After bathing, rub your body vigorously with a brush or loofah.

4. Pills for the mind (powder of the roots of Scutellaria Baikal, ginger, Rhodiola rosea, Leuzea safflower, Schizonepeta incised, Moldavian snakehead, mountain arnica, meadowsweet, Astragalus membranous, fluffy bloat, Bacopa 1 Chagieri 2 tablets - 3 once a day after meals.

5. Arnica tincture 10 drops per 50 ml of water in the morning and in the evening.

An example from practice. *Patient N., 55 years old, a resident of Nizhny Novgorod. Has been suffering from diabetes mellitus with concomitant symmetric polyneuropathy for about 3 years. All kinds of consultations and recommendations of therapists, psychologists, endocrinologists, neurologists and psychiatrists did not lead to a positive effect. Assigned the above treatment and part-time employment. The symptoms of asthenia gradually disappeared after 1.5 months.*

Traditional medicine

• Boil 50 g of eleutherococcus roots and 10 g of oregano herb for 15 minutes in 1 liter of water, drain. Drink warm up to 4 glasses a day.

• Take 30 g of sage leaves, brahmi (bakopa) and rosemary leaves and savory herbs, pour 1 liter of red wine, put in a water bath and heat for 30 minutes. After cooling, strain and drink 150 ml after meals.

Diabetic foot syndrome

According to the International Standards in the Treatment of Lesions of the Lower Extremities in Diabetes (1999) and some Russian clarifications, diabetic foot syndrome (DFS) is pathological changes in the peripheral nervous system, arterial and microvasculature, posing an immediate threat to the development of ulcerative-necrotic processes and gangrene of the foot (I . I. Dedov et al., 2005).

The arsenal of agents used for the local treatment of wounds has expanded significantly, but, despite this, the results remain not entirely satisfactory due to the high cost and low availability of a number of drugs for widespread use.

Previously accepted inpatient treatment for several months is not economically feasible.

Wound healing proceeds according to general laws and standard principles of tissue regeneration. The rate of this process, its outcomes depend on the degree and depth of the wound damage, the structural features of the affected organ, the general condition of the body, and the treatment methods used. A complex complex of physicochemical changes occurs in the wound, leading to the development of acidosis due to the accumulation of organic and inorganic acids as a result of inflammatory processes, necrotic changes, tissue detritus (A.I. Strukov, V.V. Serov, 1993). The main causative agents of diabetic foot infection are *S. aureus, E. faecalis, P. aeruginosa, P. mirabilis* (V.V. Privolnov et al., 2008).

Treatment. Currently, the drugs parmidin, ethamsylate, calcium dobesilate, tribenoside have begun to be used as very effective angioprotectors.

Phytotherapy. This disease is popularly called Antonov Fire. The disease is serious and in advanced forms it can only be treated surgically. Upon hearing this diagnosis from doctors, many fall into depression, taking it literally as a death sentence, and consider the disease incurable. However, for a long time, healers and herbalists have developed and applied in practice herbal treatment of diabetic foot (V.F.Korsun, E.V. Korsun, 2013). Elements of phytotherapy in the treatment of diabetic foot are secondary, but important in terms of increasing the effectiveness of the ongoing complex treatment, reducing the frequency and severity of side effects from chemotherapy (hepato- and nephrotoxicity) and antibiotics (systemic dysbiosis). Of no small importance is the improvement of the quality of life of this category of patients hoping for an improvement in the prognosis of the disease (Yu. A. Zakharov, VF Korsun, 2002).

Unfortunately, there are not so many universal conservative remedies for the treatment of patients with diabetic foot in the hands of a doctor. Some help in the treatment of vascular disorders in diabetic foot can be provided by herbal preparations - aescuzan, angionorm,

esflazid, semi-synthetic production of rutin - troxevasin, etc. The mechanism of action of angioprotectors is different. An inhibitory effect on the activity of hyaluronidase, inhibition of prostaglandin biosynthesis, anti-bradykinin action and other factors play a certain role. Angioprotectors are often included in the complex pathogenetic therapy of diabetes mellitus.

In recent years, the increasing attention of researchers began to attract the funds of various plants and biopolymers containing carbohydrates. Such biopolymers include pectin substances, which are based on pectic acid, which is polygalacturonic acid.

The study was carried out on the basis of the department of purulent-septic surgery of the City Clinical Hospital No. 81 in Moscow (BS Briskin, EA Tartakovsky, NA Gvozdev, Ya. I. Yakobishvili, 1999). The material is based on the analysis of the results of treatment of 124 hospitalized patients with complicated forms of diabetic foot aged from 36 to 84 years. There were 27 men (21.8 %) and 97 women (78.2 %).

The duration of diabetes mellitus in the observed category of patients averaged more than 15 years, which undoubtedly influenced the severity of the wound process, due to neurovegetative disorders and pronounced changes in microcirculation.

Based on the proposed classification, 66 patients (53.2 %) were diagnosed with a neuropathic form of foot lesions, and 58 (46.8 %) were neuroischemic. The neuroischemic form of foot lesion occurred with a predominance of neuropathy - in 65 % and a predominance of ischemia - in 35 %. Of these, 63 patients (50.8 %) received standard therapy as a local treatment, depending on the stage of the wound process, and in 61 (49.2 %), along with traditional methods in the local treatment of purulent wounds, the drug nutrisorbosan was used, hygienic certificate No. 40.01 .71.919 P 000130.02.01 from 25.12.00 (3).

The group of observed patients includes patients with type 1 and type 2 diabetes mellitus. All the patients studied by us had trophic disorders in the tissues of the foot with the formation of ulcers, abscesses, phlegmon, osteomyelitis,

necrosis, gangrene. In 88 patients (80 %), various organ-preserving surgeries were performed on the foot (opening and drainage of phlegmon, disarticulation of the fingers, resection of the feet, necrectomy).

The drug nutrisorbosan was used in the first and in the second phase of the wound process according to the following method: after treatment of the wound surface with a 3 % solution of hydrogen peroxide, washing with a 1 % solution of chlorhexidine and drying, a thin layer of the drug in the form of a powder was applied to it. Depending on the severity of the exudative tissue reaction to the wound, either sterile dry or gauze napkins moistened with 10 % sodium chloride solution were placed and the bandage was fixed. The procedure was repeated 1 to 2 times a day.

Treatment with nutrisorbosan was carried out along with complex therapy, including:

correction of carbohydrate disorders;

antibacterial therapy taking into account microflora;

homeostasis correction;

the use of angioprotectors, antioxidants, antiplatelet agents, neurotropic drugs;

symptomatic remedies;

HBO.

The initial characteristics of the wound discharge revealed a fairly high bacterial contamination of wounds (104) with a predominance of aerobic-anaerobic microflora *Staphylococcus aureus, Escherichia coli, Bacteroides, Peptostreptococcus* , with a predominance of necrotic, degenerative-inflammatory and inflammatory types of cytogram.

Significant differences in the dynamics of the wound process in the main and control groups were already noted by the 7th day of treatment, which was characterized in 44 patients (72.1 %) of the main group by the accelerated transition of the first phase of the wound process to the second. The cytological picture was characterized by the

predominance of neutrophilic leukocytes with a normal structure of nuclei and cytoplasm, complete phagocytosis in neutrophils and fibroblasts, active polyblastic and fibroblastic reaction of the cellular elements of the connective tissue, the absence of microflora in 28 patients (45.9 %) or its sharp suppression in 24 (39.3 %) (102), which makes it possible to refer it to the group of mixed antiseptics (Fig.). It is noted that the drug nutrisorbosan has pronounced adsorptive, hygroscopic and proteolytic properties, which helps to cleanse the wound from purulent exudate and detritus.

The end of the study was determined by the cleansing of the wound and the activation of regeneration processes, manifested by the appearance of active granulations and edge epithelialization.

By the 15th day of treatment, the differences in the course of the wound process in the study groups continued to increase, which was manifested by the completion of the second stage of the wound process and the appearance of insular and marginal epithelialization. Evaluation of the results of a microbiological study revealed a sharp decrease in the contamination of wounds (102 on average). This allowed in 48 patients (78.7 %) of the main group to perform flattening of the wound edges or plastic closure of the wound defect.

In patients in the control group who received traditional treatment, the course of the wound process significantly differed from the patients in the main group: a tendency towards cleansing of trophic ulcers and postoperative wounds in most patients - 39 (61.9 %) was observed only on the 10-12th day, and granulation the tissue did not appear earlier than on the 14th day.

The hospital stay of patients in the main group averaged 22.8, in contrast to patients in the control group with an average bed-day of 25.5.

Thus, the results of the performed analysis allow us to draw the following conclusions.

The drug nutrisorbosan, by increasing phagocytosis, promotes accelerated cleansing of the wound from necrotic

tissues.

Along with the influence of proteolytic enzymes: neutrophils, macrophages, the drug has a complex effect that accelerates the first phase of the wound process - it promotes the primary cleaning of the wound and activates the second phase with the formation of granulation tissue.

The drug has a pronounced antimicrobial effect, which makes it possible to refer it to a number of mixed antiseptics.

The advantage of this drug is the possibility of using it in patients sensitized to other drugs, the absence of irritating effects on the skin.

The use of the drug made it possible to reduce the duration of hospital stay by an average of 2.7 bed-days.

The study made it possible to characterize the drug as an effective agent in the local treatment of purulent wounds in patients with complicated forms of diabetic foot.

In our opinion, phytotherapy of patients with diabetic foot should be approached in a comprehensive manner. For a number of years we (VF Korsun, EV Korsun, TE Trumpe, 2004) have built a specific treatment algorithm for patients with diabetic foot and even in the presence of wet gangrene (Table 12).

Table 12

The main directions of herbal medicine for diabetic foot syndrome

Plants with recommended pharmacological properties

1. Collection of medicinal herbs containing (in parts):

Chamomile flowers - 2

Violet tricolor herb - 1

Horsetail herb - 1

St. John’s wort herb - 2

Yarrow herb - 1

Calendula flowers - 2

Common oak bark - 1

Marsh cinnamon grass - 1

Sweet clover herb - 1

Mix. A teaspoon of the mixture of herbs is poured with a glass of boiling water, boiled in a water bath for 5-10 minutes, infused for 45 minutes, filtered and taken 1/2 cup 2 times a day after meals for at least 1-2 months.

2. Chagair (chaga, aspen bark, alpine penny grass, penny kopeck, astragalus membranous, calendula flowers, common tansy, dioecious nettle leaves, lingonberry) 2 tablets 3 times a day before meals.

3. Angionorm 1 tablet 3 times a day 40 minutes after meals.

4. Fitoren (water-alcohol extract from flowers of calendula, chamomile, yarrow herb, aralia roots, aloe juice, Kalanchoe) add 1 teaspoon to herbal tea (item 1) daily.

5. DHCdiab (chaga, dihydroquercetin, licorice, chicory) 1 capsule 1-2 times a day before meals for 1-2 months.

6. Every 5 days, alternate the means of local therapy (Table 12).

An example from practice. *Patient H., 56 years old, artist, resident of Moscow. Has been suffering from type 2 diabetes mellitus, diabetic foot syndrome for 3 years. Against the background of this disease, severe itching appeared, at the site of scratching - a small trophic ulcer, which after 2 months acquired a size of 3 × 4 cm with flaccid granulations. On the periphery of the ulcer - multiple bright red small and rather large spots, nodular eruptions. Treatment by a dermatologist or surgeon did not lead to the desired result. The level of prothrombin in the blood is 109 units. The above treatment was prescribed for 1.5 months. On re-examination, the size of the ulcer decreased by almost 2 times; the vasculitis phenomena disappeared. The ulcer is covered with bright pink granulations. He continues treatment.*

Traditional medicine

• Take 100 g of nettle leaves and chamomile inflorescences, 50 g each of hyssop herb, wheatgrass rhizomes, angelica, dandelion, licorice. 1 teaspoon mixture pour 1 cup boiling water for 20 minutes, and used topically inside and 1 tablespoon of infusion 3 times a day.

• Take 30 g of blackhead herb, 5 g of mountain arnica herb, juniper fruits, oak acorns, 10 g of fennel herb, flax seeds, nettle leaves. Grind on a coffee grinder, pour the resulting powder once a day into a trophic ulcer. The collection can also be used for washing.

• Take 1 fresh egg, 50 g of honey, 30 ml of propolis tincture, 0.5 g of copper acetate. Mix all components. Use externally on a trophic ulcer under a bandage.

A number of drugs that improve microcirculation, normalize vascular permeability, reduce edema of vascular tissues and improve metabolic processes in the walls of blood vessels, in recent years have been widely used in the treatment of various angiopathies: diabetic angiopathies (including retinopathies, nephropathies, lesions of cerebral and coronary vessels, vessels of the lower extremities, etc.), violations of vascular permeability in rheumatoid diseases, atherosclerotic vascular lesions, venous diseases with congestive and inflammatory phenomena, as well as trophic ulcers, permeability disorders associated with an overdose of anticoagulants, etc. Angioprotective (or capillary-protective) effect provide preparations of the vitamin P group (Baikal vitamin P, divertin), ascorbic acid, anti-inflammatory substances, especially non-steroidal ones, etc.

Diabetic nephropathy

According to a number of authors, diabetic nephropathy develops in diabetic nephropathy in 31–64 % of cases with diabetes - a specific kidney damage accompanied by the

formation of nodular or diffuse glomerulosclerosis, the terminal stage of which is characterized by the development of chronic renal failure (CRF) requiring dialysis or kidney transplantation.

Over the past 10 years, in the USA and Japan, diabetic nephropathy has come out on top in terms of the need for replacement therapy among all kidney diseases (40-50 %), pushing aside such primary diseases as glomerulonephritis, pyelonephritis, polycystic kidney disease, etc. to the second or third position.

In Russia, according to the registry of patients with chronic renal failure in 2003 , patients with diabetic nephropathy account for only 7 % of dialysis sites, although the real need for dialysis therapy in this category of patients in Russia is the same as in developed countries (M.V. Shestakova et al., 2001).

In patients with diabetes, hemodynamic changes in the vessels of the kidneys and the circulatory system are quite often found. The commonality of functional and morphological changes in the microcirculation of the glomeruli of the kidneys and the retina was noted. The appearance of albuminuria in patients with diabetes indicates not only the development of nephropathy, but also proliferative retinopathy.

Disorders of autoregulation of peripheral capillary blood flow correspond to microcirculatory lesions of the glomerular apparatus. Transcapillary release of albumin (TBA) indirectly reflects the transition of albumin from blood plasma to kidneys and other tissues and is considered as a marker of vascular damage in the microvasculature (S. A. Mravyan, 2001).

Hypercoagulation and damage to the fibrinolysis system in combination with hyperactivation of thrombocytes in patients with diabetes lead to arterial hypertension, glycemic and lipidemic disorders with manifestations of vascular damage. At the same time, there is an increase in the activity of a number of components of the coagulation system, including the Willenbrand factor produced by the endothelium. A high concentration of factor VIII components leads to

hyperglycemia, an increase in the rate of thrombin formation and an increase in occlusive vascular lesions in patients with diabetes.

Hyperglycemia activates protein kinase C in endothelial cells, which can cause an increase in the production of vasoconstrictor prostaglandins, endothelin and angiotensin-converting enzyme, or indirectly has a damaging effect on vasomotor reactivity. Moreover, hyperglycemia interferes with the production of matrix by endothelial cells, which can lead to an increase in the thickness of the main membrane. Hyperglycemia increases the synthesis of type 4 collagen and fibronectin by endothelipal cells with an increase in the activity of enzymes involved in collagen synthesis. In high concentrations, glucose has a direct (independent of osmolality) toxic effect on vascular epithelial cells. This toxic effect can lead to a decrease in endothelin-dependent vascular relaxation, an increase in vasoconstriction, stimulation of smooth muscle cell hyperplasia, vascular remodeling and the development of atherosclerosis (S. A. Mravyan, 2001).

Treatment. The main task of diabetes therapy is to normalize metabolic processes disturbed by insulin deficiency. Opportunities for the prevention of diabetic nephropathy became absolutely available after the discovery of the extremely important role of the local renal renin-angiotensin system in impaired intrarenal hemodynamics and the initiation of sclerotic changes in the kidneys in diabetes mellitus.

The absolute leader among the most frequently prescribed and ACE for diabetic nephropathy was enap or enap N (a combination of 10 mg enalapril with 25 mg hydrochlorothiazide). In case of insufficient effectiveness and ACE, calcium antagonists or loop diuretics should be added, primarily indapamide. But at high concentrations, they increase fasting glucose and glycated hemoglobin concentration, and also impair tolerance to oral and intravenous glucose load.

Phytotherapy. It is the method of choice in the treatment of the initial manifestations of type 2 diabetes mellitus and an auxiliary health-improving factor in type 1

diabetes for the prevention of the development of diabetic nephropathy. In patients with impaired glucose tolerance, a combination of regimen and diet can stop further development of the disease. When a mild form of diabetes is detected, the timely appointment of adequate herbal medicine provides compensation for metabolic disorders and also prevents the progression of the disease. The absence or insufficient severity of the therapeutic effect of phytopreparations is not associated with the failure of the method. Often we have to deal with the appointment of irrational prescriptions for fees, improper preparation of extracts from them, incorrect doses and non-compliance with the conditions of admission. The widespread introduction of the method is hindered by the lack of awareness of doctors about its capabilities and the negative attitude of some of the patients and doctors towards it. At the same time, phytotherapists in many countries have accumulated significant experience in the successful treatment of diabetes.

The main directions of herbal medicine for diabetes have a deep scientific basis, the prospects of their application are obvious. Our own long-term clinical experience allows us to recommend this direction as the therapy of choice at the initial stage of treatment.

For any type of diabetes, patients are prescribed herbal medicine as an auxiliary component aimed at improving tissue microcirculation, normalizing the functions of the cardiovascular system, central and peripheral nervous system, kidneys and eyes.

Preferred are phytocompositions, consisting of four groups of plants - the main action, additional action, correctors of taste, aroma and unwanted effects on the body. The collection of medicinal plants must be made up of approved plant materials. The composition of phytocompositions must be adjusted every 2 months, and phytopreparations containing sedative, adaptogenic, hepato-, nephro- and gastroprotectors - every 2 weeks due to changes in the receptor apparatus of organs and tissues.

When prescribing diuretic and sorption drugs, the treatment complex should include plants containing the trace element magnesium (currants, blackberries, raspberries, knotweed, birch, black elderberry, lagochilus, celandine, etc.) and the macroelement potassium (persimmon, apricot, banana, peaches, anise, arnica, black elderberry, astragalus, knotweed, nettle, etc.).

Each patient is given a dose, time of admission, duration of the course, allowing to normalize the level of glucose in the blood, which is absolutely possible in case of mild type 2 diabetes, prediabetes. Reception of phytopreparations is recommended 15-30 minutes before meals, 70-100 ml of infusion and 2-3 drops of a galenic preparation (tincture, extract, syrup) - for each year of a child's life up to 14 years old. An adult is given tinctures of 30-40 drops in the morning and afternoon of a tonic nature and 30 drops in the morning and evening - of a sedative, tranquilizing nature.

Herbal medicine must be carried out continuously and for life. Blood tests for glucose should be performed at least 2 times a week in a polyclinic or independently for patients using a glucometer or glucotest.

In moderate diabetes mellitus, including type 2, phytotherapy is aimed at reducing the frequency of side effects from classical antidiabetic therapy (Table 13).

Table 13

Medicinal plants used in diabetes therapy

For more than 40 years, the All-Russian Research Institute of Medicinal and Aromatic Plants (Moscow) has been conducting comprehensive research on the search and development of new phytopreparations for the treatment of diabetes mellitus (T.E. Trumpe, 1964 and others). Scientists have studied about twenty individual and combined compounds and mixtures for hypoglycemic activity. It has been established that such plants as beans, blueberries, zamaniha, Jerusalem artichoke, chicory, goat's rue can and should be used both as an additional (for insulin-dependent) and as the main remedy and dietary product (for an insulin-independent type of disease).

Employees of the institute offered and received a positive assessment of more than 50 thousand patients treated with the original collection of herbs called "Arfazetin".

The phytocomposition includes (in grams):

Blueberry shoots - 20.0

Bean shells - 20.0

Aralia roots - 10.0

Horsetail herb - 15.0

Rosehip fruits - 15.0

St. John's wort herb - 10.0

Chamomile flowers - 10.0

Mix. 10 g of the collection is poured with 400 ml of hot water, heated in a water bath for 15 minutes, cooled at room temperature for at least 45 minutes, filtered. The remaining raw materials are squeezed out. The volume of the resulting infusion is brought to 400 ml of boiled water. Take the infusion 30 minutes before meals, preferably warm, 1 / 3-1 / 4 cup 2-3 times a day for 20-30 days. After 15 days, the course of treatment is recommended to be repeated. 3-4 courses are conducted per year.

Medicinal plants **cannot** completely replace antidiabetic drugs. Medicinal plants can be combined with a diet used as monotherapy (adult diabetes compensated only by diet), exercise, as well as with antihyperglycemic drugs under constant medical supervision.

With an increased brain demand for glucose in patients with diabetes mellitus against the background of angiopathy and atherosclerotic stenosis of cerebral vessels, an insufficiently developed collateral network of cerebral vessels, a high level of counterinsular hormones cortisol and glucagon is noted, which prevents the implementation of the effects of insulin.

On the one hand, this satisfies the high brain demand for glucose due to its endogenous synthesis (gluconeogenesis) in the liver from the amino acids of body proteins, while the blood glucose level rises. In the course of gluconeogenesis, proteins undergo increased catabolism (decay) with the formation of residual nitrogen, the development of hyperazotemia, and in the absence of chronic diabetic nephrosclerosis, hyperazoturia. As a result, during decompensation of diabetes mellitus (ketoacidosis, etc.), a sharply increased level of glucose in the blood correlates with a sharp increase in the level of creatinine and urea in the blood, a negative nitrogen balance.

On the other hand, insulin cannot be realized as a key anabolic hormone of protein synthesis. As a result, protein synthesis, DNA, RNA and mitotic activity of a number of cells are suppressed, protein degradation, violation of trophic and

regenerative processes in patients with diabetes mellitus, immunodeficiency, progressive metabolic disorders - severe energy deficiency, destruction of the hydroproterin intracellular complex with loss of muscle proteins, dehydration, hypokalemia …

Analysis of the world literature leads to some hypotheses explaining the mechanism of the hypoglycemic action of preparations from herbal medicinal raw materials.

• Plant substances enrich the body with alkaline radicals. In a weakly alkaline solution in the presence of Ca (OH) 2, glucose can spontaneously convert to mannose when insulin is not required for its absorption, which can indirectly reduce the need for exogenous insulin (eggplant, zucchini, cucumbers, pumpkin, etc.). At the same time, acidosis decreases.

• A number of plants (galega, beans, peas, etc.) containing a galegin derivative of guanedoisomalein act like biguanides in the biosynthesis of urea.

• Under the influence of a number of phytopreparations, the restoration of the beta cells of the pancreas, which produces insulin, is enhanced, and the regeneration of insulin-producing cells in the Langerhans islets of the pancreas (most likely lectins, glucokinins) occurs.

• Some medicinal plants, along with hypoglycemic, have an immunocorrective effect, which is often required in the complex therapy of patients with diabetes. Eleutherococcus, ginseng, zamaniha, aralia, lemongrass, rhodiola, leuzea, etc. have immunocorrective properties. Like insulin, they increase the level of GMF in the liver and muscles, exerting an insulin-like effect.

• A number of plants contain an increased amount of essential amino acids necessary for maintaining anabolic processes, ensuring the effective functioning of the nervous and immune systems (buckwheat, soy, asparagus, green peas, beans).

• Saturation of the body with phyto-dietary products that increase the absorption of oxygen by the body and reduce the effects of hypoxia (apricot, quince, watermelon, birch, grape,

pear, blackberry, cucumber, peach, blueberry, mountain ash and chokeberry juices).

• Enriching the diet with foods containing an increased amount of vitamins and minerals (especially chromium and zinc) due to vegetables, fruits and herbal teas containing strawberries, nettle, raspberries, primrose, mountain ash, black currants, rose hips, etc.

• Excretion of excess glucose from the body using phytopreparations with a diuretic and nephroprotective effect (birch leaves, knotweed grass, St. angelica).

Complex individually oriented therapy of diabetes mellitus allows to achieve compensation of metabolic disorders, prevents the progression of the disease and the development of complications. However, to a large extent, its success depends on the efforts of the patient himself, on the social and living conditions in which he lives, on the attitude of the people around him to him. Progress in the fight against this serious ailment cannot be achieved without efforts to develop a healthy lifestyle from childhood.

With diabetic nephropathy, there are a number of features in the conduct of herbal medicine. For the treatment and prevention of this complication of diabetes, it is necessary to recommend phytotherapy to patients with insulin-dependent diabetes at the stage of microalbuminuria and proteinuria. This applies to the correction of biochemical processes (Table 14).

The purpose of herbal medicine. Reducing side effects from prescribed chemotherapy drugs, lengthening the relapse period, preventing kidney wrinkling, restoring kidney function and urination, accelerating the healing process, improving the quality of life.

Table 14

Phytocorrection for diabetic nephropathy

Recommended treatment algorithm

1. Collection of herbs (parts):

Horsetail herb - 2

Alpine penny root - 2

Tansy flowers - 3

Chaga - 1

Agrimony grass - 3

Catalpa fruits - 2

Astragalus herb - 2

Leuzea herb - 3

True Bedstraw Grass - 2

Grass lepedetsa kopeechnikova - 4

Mix. Pour 1 tablespoon of a mixture of herbs into 0.5 liters of boiling water in the evening, insist overnight, strain in the morning and drink during the day before meals. The course is up to 2 months.

2. Diacor 2 tablets in the morning and afternoon before meals.

3. Chitopan, 2 tablets in the morning and evening.

4. Phytoparosauna with sbr (p. 31) daily, per course - 10-15 procedures.

5. Thioctacid 600 mg in the morning before meals.

6. Diabetuline 1 capsule 2 times a day.

7. Tincture of leuzea or corfit, 1 teaspoon in the morning and afternoon.

In case of persistent albuminuria, hematuria, it is recommended to increase the dose of herbs and to introduce into the phytocomposition the phytocomposition of plants with hemostatic action (Pepper or Chilli grass, shepherd's purse, etc.).

With long-term hypertension, plants of sedative and hypotensive action, introduced into the recipe (hawthorn, hops, motherwort, etc.), can be prescribed.

To prevent the progression of nephropathy, its transition to nephrotic, hypertensive or mixed forms, it is recommended to sanitize chronic foci of focal infection (caries, dysbiosis, tonsillitis, etc.).

An example from medical practice. *Patient P., 53 years old, a resident of Moscow. Suffering from diabetes mellitus,*

complicated by nephropathy, for about 2 years. She was treated three times in the nephrology department of hospital No. 1. With prolonged use of glucocorticosteroids, Cushing's syndrome, grade 3 dysbiosis, bulimia, gastroduodenitis, and reactive pancreatitis developed. The appointments were made for the consultation: Hitokor, 1 tablet 2 times a day; abisib 1 teaspoon before meals 2 times a day; biovestin-lacto, a teaspoon 2 times a day; arnica-6, 8 granules 2 times a day; phytoren, 20 drops, 2 times a day; licorice syrup 5 drops 3 times a day. Urine and blood counts have stabilized. The phenomena of Cushing's syndrome, dysbiosis have practically disappeared; signs of bulimia, reactive pancreatitis persist. He continues to be under the supervision of a phytotherapist. Remission of the disease is about 6 years.

The use of herbal medicines allows to reduce the excretion of protein in the urine, helps to maintain the functional properties, morphological integrity of the capillary epithelium and the basement membrane of the renal glomeruli; has an anti-sclerotic effect.

At present, the principle of **diet therapy** is observed all over the world using a diet containing 50-60 % carbohydrates from the daily calorie content, 15-20 % proteins and 25-30 % fats. The main difficulty in the practical application of these recommendations is that patients, as a rule, have difficulty adhering to them. There are several reasons for this.

• Insufficient knowledge of patients with issues of diet therapy of diabetes mellitus. Patients often do not understand the importance of this type of treatment and do not have the practical skills to ensure they can follow the diet.

• When drawing up recommendations for diet therapy, sometimes they do not take into account the fact that human nutrition, in addition to the physiological aspect, has a great emotional impact and has an important social significance.

At the first stage of diabetic nephropathy - the stage of microalbuminuria, the patient should adhere to his usual

diet with minor restrictions, which for kidney function are more of a preventive than a curative nature.

In the diet, the protein content should not exceed 0.8–1 g per 1 kg of normal body weight, which is on average 60–70 g per day for men , and 50–60 g for women . About 50 % can be animal proteins … There are recommendations for the preferential intake of plant proteins, since it was assumed that animal proteins are a heavier “burden” for kidney function than plant proteins. Recommendations have appeared to replace the “red meat” of animals with the “white meat” of fish and poultry, especially chickens. However, recent studies have not established a reliable value of the protein source in diabetic nephropathy at the stage of microalbuminuria. Replacing part of the meat with moderately fatty and fatty sea fish can have a positive effect not due to protein, but due to the presence of omega-3 fatty acids in fish. No reliable benefit was found (in terms of the transition to the 2nd stage of the disease) from replacing one type of meat with another. The main thing is the amount of protein consumed. A clearly unfavorable effect on renal function was found when the protein content in the diet exceeds 1.3–1.5 g per 1 kg of body weight. This is due to the fact that high-protein food increases the load on the kidneys due to hyperfiltration through the glomeruli (glomeruli) of excess protein metabolism products, and also contributes to the development of intraglomerular hypertension.

The patient’s ability to independently take into account, at least approximately, the amount of protein in the diet will allow the data set out in the “Proteins” section of Chapter 4, as well as Appendices 1 and 2, which provide information on the protein content in staple foods and many dishes.

In cases of even a slight increase in blood pressure, it is important to immediately reduce the consumption of table salt to 6 g per day. This involves severely restricting sodium-rich foods and preparing food with minimal salt or unsalted salt, followed by a little salt during meals. Two interrelated circumstances should be taken into account: first, the high salt sensitivity of arterial hypertension in diabetes mellitus, which is characterized by an increase in blood pressure even with a

slight increase in salt intake; secondly, the reliably established progression of diabetic nephropathy in arterial hypertension. In the absence of arterial hypertension, salt intake may correspond to the norms of a healthy diet - no more than 8-10 g per day.

In the second stage of diabetic nephropathy - the stage of proteinuria - it is necessary to switch to a diet that can be described as moderately low in protein. Protein intake should be 0.75–0.8 g per 1 kg of normal body weight, or an average of 55 g per day for men and 40–45 g for women. Of the specified amount of protein, up to 50 % must be of animal origin. Since a decrease in protein intake leads to a decrease in the energy value of food, then it must be replenished with carbohydrates with careful monitoring of blood glucose levels with an increase in carbohydrate intake. Considering almost the same energy value of proteins and carbohydrates, the amount of the latter in grams increases by as much as the amount of protein in grams has decreased.

Moderate restriction of protein in the diet to some extent inhibits the progression of kidney damage with an outcome in CRF. Currently, such dietary restrictions are recommended not only for patients with moderate proteinuria, but also for patients with nephrotic syndrome and proteinuria more than 3–3.5 g per day. However, in order to prevent the development of protein deficiency in the body with an increased excretion of protein in the urine, it is advisable to compensate for these protein losses in the diet at the rate of 1 chicken egg for every 6 g of protein in daily urine.

It should be emphasized that the recommended protein intake (in g per 1 kg of the patient’s normal body weight) for the first and second stages of diabetic nephropathy corresponds to the modern recommendations of most nephrologists, diabetologists and nutritionists of the world and is reflected, in particular, in the American ones published in 2007 “ Diabetes Care Standards ”prepared by the American Diabetes Association. We draw attention to these facts, since in the medical literature one can find outdated indications of the need for a more significant restriction of protein intake.

In case of frequent occurrence of arterial hypertension at the stage of proteinuria, it is imperative to limit the consumption of table salt to 5-6 g per day. But with concomitant nephrotic syndrome, an even greater restriction of salt is required (up to 2-3 g per day), which is usually accompanied by a decrease in edema and arterial hypertension characteristic of this syndrome. In practice, such a sharp restriction of table salt means not only the elimination of salting food during meals, but also the transition to salt-free types of bread and bakery products, since 100 g of these common products contains at least 1 g of table salt. Such nutrition is sometimes poorly tolerated if the transition to it was abrupt. Therefore, the transition period to salt-free food can be several days for the adaptation of taste sensations. Of great importance is the widespread use of products that improve the taste of food: tomato (no salt) and lemon juices, vinegar, spices and spicy vegetables, dry white wine, etc.

At the third stage of diabetic nephropathy - chronic renal failure (CRF):

• Different degrees of protein restriction in the diet, depending on the severity of chronic renal failure in order to reduce azotemia and excessive filtration through the kidneys of protein metabolism products.

• Providing the corresponding energy consumption of the body with the energy content of the diet due to carbohydrates and fats, which improves the absorption of food proteins and reduces the breakdown of proteins in the body.

• Regulation of sodium (table salt) and fluid intake, taking into account the state of renal excretory function; restriction of sodium chloride and liquid in case of edema and arterial hypertension.

The most important issue of diet therapy is to determine the amount of protein in the diet, which will not lead to an increase in azotemia or the breakdown of its own proteins, but will provide the need for essential amino acids with limited protein intake, that is, prevent protein deficiency in the body with a kind of “intolerance” of food protein from for renal dysfunction.

In the initial stage of chronic renal failure, nutrition is based on a diet, the protein content of which should not exceed 0.7 g per 1 kg of normal body weight, on average 45-50 g per day (of which 55-60 % are animal proteins). These average values can be slightly reduced or increased taking into account laboratory data on renal function and patient well-being.

A variant of the above diet with a predominance of not animals, but plant proteins - up to 85 % of the total amount of protein in the diet is proposed. In this case, the daily protein intake can be increased to an average of 60–65 g. The energy value of the diet should be at least 2200–2400 kcal at the rate of 35 kcal per 1 kg of normal body weight. In a diet dominated by plant-based proteins, the best sources of animal protein are milk and dairy products or eggs.

Diabetic microangiopathy

Diabetic angiopathies are becoming the most common cause of disability and death in patients with diabetes mellitus (DM). Serious clinical studies have proven the high efficiency of stable diabetes compensation and normalization of blood pressure (BP) as a way to prevent the onset and progression of diabetic angiopathies (MI Balabolkin, EM Klebanova, VM Kreminskaya, 2000). However, given the multifactorial nature of the mechanism of angiopathy development, achieving diabetes compensation is not the only way to prevent vascular lesions. Despite the active work of many research and treatment centers, there are still no generally accepted practical recommendations for drug prevention and treatment of the manifestations of diabetic microangiopathy (retinopathy, neuropathy, cardiopathy, etc.). The search for the optimal drug therapy for diabetic retinopathy, which serves as an addition to the recommended treatment standards, is being conducted in various directions (M.E. Statsenko, N.V. Sobolevskaya, 2012).

In recent years, close attention has been paid to such factors of the development and progression of diabetic microangiopathy as endothelial damage, increased capillary

permeability, decreased ability of erythrocytes to deform, increased platelet aggregation and activation of coagulation factors (in particular, increased fibrinogen levels), which disrupt intravascular microcirculation, promote occlusion of capillaries and prevent changes in the capillary wall (S. S. Ilyenkov, D. E. Vainik, 2000). The data obtained confirm that it is necessary to include effective correctors of microcirculation - angioprotectors and antiplatelet agents - in the treatment regimens in the conservative therapy of diabetic microangiopathies.

Treatment. The main advantages of herbal remedies are: high pharmacotherapeutic efficacy, the presence of a wide range of pharmacological activity, the absence of negative side effects, low toxicity with prolonged use (S. M. Batorova, 1989; S. M. Nikolaev et al., 2008).

In recent years, plant angioprotectors based on an extract from the fruits and seeds of horse chestnut (escusan, esflazid, escin, etc.) have been actively used to correct various vascular disorders, however, these drugs have little effect on platelet aggregation (T.V. Chuiko, V.F. . Korsun, 2000).

Of course, sweet clover is one of the brightest representatives of this group, but it makes it all the more interesting to talk about other, less well-known representatives of the plant world that have anticoagulant properties, for example, chestnut, blueberry, dandelion. The latter, by the way, significantly increases the level of antithrombin III, which accounts for up to 80 % of the total anticoagulant activity of plasma. In addition, dandelion stimulates fibrinolysis, that is, it dissolves intravascular blood clots. The berries of blueberries, currants, sea buckthorn, caraway fruits contain oxycoumarins. Without going into the chemical composition of these compounds, it should be noted that of the entire group of coumarins, it is they who have an anticoagulant effect.

In order to obtain a drug that provides a multilateral positive effect on pathological conditions - diseases with severe vascular insufficiency and disorders in the hemostasis system (diabetes mellitus, etc.), CJSC “FPK PharmVILAR”

on the basis of the All-Russian Research Institute of Medicinal and Aromatic Plants (VILAR) has developed a medicinal the drug angionorm®.

In preclinical studies, the specific antiaggregatory activity of Angionorm® was studied under conditions of *in vitro* and *in vivo* experiments *in the* laboratory of pathology and pharmacology of hemostasis of the State Scientific Center of the Russian Academy of Medical Sciences (head - Professor V. A. Makarov); other pharmacological properties were studied in VILAR. As a result of the studies, it was shown that Angionorm® has a complex of pharmacological properties, among which the main ones are antiaggregatory, anti-inflammatory and angioprotective, diuretic.

Angionorm® effectively affects the cellular link of hemostasis. This is confirmed by the antiaggregatory effect of the drug, noted both *in vitro* and *in vivo* . It was found that angionorm significantly and dose-dependently inhibited the aggregation of human platelets in vitro when using both ADP and collagen as a proaggregant (Table 1, Fig. 1). 100 % inhibition of collagen-induced platelet aggregation was observed at a drug concentration of 5.0 mg / ml.

Under the conditions of *in vivo* experiments, angionorm already one day after the first injection at a dose of 100 mg / kg sharply (3.2 times, p & lt; 0.01) suppressed the severity of interplatelet interaction initiated by collagen, and this effect persisted throughout all 14 days of drug administration (Tables 15, 16, Fig. 1, 2). 7 days after its cancellation, the aggregation value returned to its original values.

Table 15

Effect of angionorm on human platelet aggregation *in vitro* (Amax, M ± m,%)

* or ** - reliability of differences from control at p & lt; 0.05 or p & lt; 0.01.

Table 16

The effect of angionorm on collagen-induced platelet aggregation in rabbits after repeated administration at a dose of 100 mg / kg (Amax, M ± m,%)

* or ** - reliability of differences from baseline at p & lt; 0.05 or p & lt; 0.01.

Figure: 1. Influence of angionorm on human platelet aggregation in vitro

Figure: 2. Effect of angionorm on platelet aggregation in rabbits after repeated administration at a dose of 100 mg / kg

Experimental studies have shown that Angionorm® exhibits:

• pronounced anti-inflammatory activity, which was expressed in a significant decrease in the severity of formalin and histamine edema of the extremities in mice. Reduced the amount of inflammatory exudate in the abdominal cavity in rats treated with the drug, compared with the control (Table 17);

Table 17

The effect of angionorm on inflammatory edema of the extremities in mice and experimental peritonitis in rats

* or ** - reliability of differences from control at p & lt; 0.05 or p & lt; 0.01.

• noticeable capillaroprotective activity, which was characterized by a significant decrease in vascular permeability in the focus of inflammation in mice, rats and guinea pigs (Table 18);

Table 18

Effect of angionorm on skin vascular permeability in mice, rats and guinea pigs

* or ** - reliability of differences from control at p & lt; 0.05 or p & lt; 0.01.

• distinct analgesic activity - the administration of the drug led to a significant increase in the pain sensitivity threshold in mice (Table 19);

Table 19

Effect of angionorm on the threshold of pain sensitivity in mice on the hot plate model

* - reliability of differences from the initial level at p & lt; 0.05.

• pronounced diuretic activity - angionorm significantly increased diuresis stimulated by water load in rats.

The combination of capillary-protective and anti-inflammatory effects promotes the manifestation of venotonic activity, and the diuretic effect established for Angionorm® enhances its anti-edema effect. Indirect confirmation of the anti-inflammatory effect of the drug is evidence of its pronounced protective effect on the gastric mucosa. The noticeable analgesic and stress-protective properties of Angionorm®, its ability to improve well-being and increase efficiency serve as an additional positive characteristic.

The breadth of the drug's pharmacological properties is determined by the variety of pharmacological properties of extracts from plants that make up its composition. The pronounced pharmacological activity of Angionorm® in combination with a high level of safety, established in an experimental preclinical study of its tolerability (V.F.Korsun et al., 2008), allows it to be widely used as a therapeutic and prophylactic antiaggregatory, lymphotropic, capillary-protective, venotonic and improving microcirculation of an agent for the treatment of acute and chronic pathological conditions (V.F.Korsun, A.N.Bespalov, E.V. Korsun et al., 2012). The drug is also useful for exacerbation of chronic diseases associated with vascular disorders, such as increased platelet aggregation (thrombosis of blood and lymphatic vessels, thromboembolism, microangiopathy in diabetes mellitus, etc.), impaired capillary permeability, microcirculation and venous circulation, varicose veins syndrome, thrombophlebitis, capillary thrombosis, myocardial infarction, etc.).

The main directions of herbal medicine for diabetic microangiopathy are presented in table. twenty.

Table 20

Directions of herbal medicine for angiopathy

Recommended treatment algorithm

1. Collection of herbs (parts):

Sophora fruit - 2

Astragalus herb - 3

Yarrow herb - 1

Melilot grass - 1

Chestnut fruit - 2

Strawberry herb - 3

Arnica herb - 1

Mix. Pour a teaspoon of the mixture of herbs with a glass of boiling water in the evening, insist overnight, strain in the morning and drink before meals for 3 doses during the day. The course is 2–6 weeks.

2. Angionorm 2 tablets at 16.00 40 minutes after eating.

3. Arnica tincture 5 drops 2-3 times a day with 50 ml of water.

4. Corfit 1 teaspoon (tablespoon) in the morning and afternoon after meals with 50 ml of water.

5. Elastinol 1 capsule 3 times a day with meals for 3 months.

Using this technique, we observed 19 patients with diabetes with severe manifestations of angiopathy. After 3.5 months of treatment, the somatic parameters and data of the organ of vision improved. Based on the above information, a preliminary conclusion can be drawn that phytotherapy is a promising direction in the treatment of diabetes mellitus and its severe complication - diabetic retinopathy.

Traditional medicine

• Take in equal proportions young annual shoots of pine or larch, fresh inflorescences of chestnut and lungwort flowers, mix. To prepare the broth, take 1 tablespoon of the mixture and pour 300 ml of hot water in the evening. They insist at night, filter in the morning and drink during the day in 4 doses before meals.

• Take a teaspoon of real bedstraw herb and a tablespoon of lungwort herb, pour 0.5 liters of boiling water, leave for 2 hours, strain. Drink warm for 2 days.

Diabetic retinopathy

This is a common change in the retina in diabetes mellitus. This disease affects 50–75 % of patients with diabetes mellitus. Diabetic retinopathy develops 7–10 years after the onset of diabetes mellitus and tends to progress. This disease ranks first among the causes of blindness and low

vision. Vision disability is noted in more than 10 % of patients with diabetes mellitus. The main reason for the decrease in central vision in patients with DR is generally recognized as damage to the macular region as a result of circulatory disorders and, as a consequence, the accumulation of pathological fluid in the retinal layers (Yu.A. Ivanishko, 2002; A.S. Izmailov et al., 2002; DG Cogan at al., 1961).

In the vessels of the retina, aggregation of erythrocytes and platelets occurs, microaneurysms appear, and obliteration of the vessels develops. As a result, tissue respiration is disrupted, connective tissue and new vessels in the retina, optic nerve, and vitreous develop in the retina. At the same time, visual acuity decreases, up to blindness.

Treatment. Drug therapy for diabetic retinopathy includes:

Timely and adequate compensation of diabetes mellitus reduces the risk of progression.

Anti-sclerotic drugs (methionine, polisponin, lipamide, atheroid).

Retinoprotective substances - retinoprotectors restore visual purple, strengthen retinal capillaries, and accelerate retinal regeneration. The most studied are blueberries, due to the presence of anthocyanosides (see common blueberry).

Beta carotene. From one molecule of beta-carotene, two molecules of vitamin A are formed, which plays a major role in the restoration of the visual pigment of rhodopsin (improves twilight vision, dark adaptation, color perception), stimulates the regeneration of cell populations (controls cell mitosis) and participates in redox processes.

Taurine (2-aminoethanesulfonic acid). Sulfur-containing amino acid. A detailed study of the distribution of taurine in the retina showed its presence in all structures with the maximum content in the outer nuclear layer of the retina.

• Its particularly important role in the function of the photoreceptor cell (participates in the process of photo signal transmission) was noted.

• It normalizes the metabolism of ocular tissues in diseases of a dystrophic nature, improves energy processes in the lens and retina of the eye (taurine is part of the drug taufon - 4 % eye drops).

• Provides antioxidant protection to the retina.

• Relieves spasm of accommodation, improving visual acuity.

• Stimulates the regeneration and metabolism of eye tissues.

It is applied orally at 0.25-0.5 g 2 times a day 20 minutes before meals for 30 days. If necessary, the dose can be increased to 2-3 g per day.

Angioprotectors in courses of 3–6 months. Drugs that reduce capillary fragility, normalize impaired blood microcirculation and metabolic processes in the tissues of the eye, reduce permeability and increase the elasticity of the vascular wall, and inhibit inflammatory processes. Rutin and its derivatives, vitamin E, ascorbic acid.

Biogenic stimulants. The polysaccharides contained in aloe, Kalanchoe, in combination with trace elements zinc, selenium, copper, have immunomodulatory activity, enhance regeneration processes.

Anticoagulants and antiplatelet agents. Published data on the effectiveness of the use of *tanakan* in the treatment of patients with type 2 diabetes mellitus with retinopathy.

Enzyme preparations for resorption of retinal hemorrhages. Enzymes bromelain, papain have decongestant, immunomodulatory, fibrinolytic and antiplatelet effects.

According to statistics (SF Klimov, 2010), patients with diabetes who have lost the ability to see make up 7-10 % of the total number of people who have completely lost their sight. Most eye diseases caused by diabetes occur as a result of disorders of the nervous and circulatory systems, the ingestion of viruses and infections. The use of bee products and herbs allows you to stop this process, and in some cases, restore lost vision. The range of herbs used for eye diseases is wide, I will

list just a few. Sharpen eyesight: Chinese lemongrass, rhubarb, celandine. Expand the blood vessels of the fundus: safflower leuzea. Improve vision: ginseng, larkspur, zamaniha, hare cabbage, medium starweed (woodlice), strawberries (berries), golden root, willow, Kalanchoe, calendula, lemongrass, burdock, onion, flaxseed, raspberries, coltsfoot, carrots, norichnik, radish, blueberry, rosehip, eleutherococcus.

SS Rathi, JK Grover, V. Vikrant, NR Biswas (2002) studied extracts of a number of plants used in Ayurvedic medicine in experimental diabetic cataract. Chinese bitter gourd (*Momordica charantia*), *Eugenia jambolana* , *Tinospora cordifolia* and *Mucuna pruriens were used* . Experience has been evaluated in the prevention of cataracts in alloxan diabetes in rats. Alloxan (120 mg / kg) has been used as a diabetogenic agent. While the control groups did not take any plant extracts, the treatment group took a freeze-dried aqueous extract of *Momordica charantia* and *Eugenia jambolana* (200 mg / kg, orally), an alcoholic extract of *Tinospora cordifolia* (400 mg / kg) and *Mucuna pruriens* (200 mg / kg, orally) every day for 4 months. The serum glucose concentration was assessed and the cataract was examined both with the naked eye and through a slit lamp. Of the eight animals in the diabetic control group, four developed cortical cataracts (stage IV) on day 90, while the remaining four developed on day 100. The incidence rate of cataracts in the groups taking *Momordica charantia, Eugenia jambolana, Tinospora cordifolia and Mucuna pruriens* on the 120th day was only 0, 0, 1 and 2. Oral intake of MC, EJ, TC and MP extracts for 1 month reduced the levels glucose in serum compared with the indicators within 48 hours by 64.33 %, 55.62 %, 38.01 % and 40.17 %, respectively. After 2 months of treatment, the corresponding indicators were 66.96 %, 59.85 %, 40.41 % and 45.63 %. *Momordica charantia* and *Eugenia jambolana* prevented the development of cataracts, while the protective effect was less in *Tinospora cordifolia* and *Mucuna pruriens* along with a significant reduction in plasma glucose levels (p & lt; 0.001).

Products from medicinal plants and beekeeping for angioretinopathies reduce blood cholesterol levels, increase

the elasticity of blood vessel walls, improve microcirculation, promote tissue regeneration and, in combination with herbs, enhance their healing properties.

The purpose of herbal medicine. Reducing side effects from prescribed chemotherapy drugs, lengthening the relapse period, preventing a decrease in visual acuity, improving the quality of life.

The main directions of herbal medicine for diabetic retinopathy are presented in table. 21.

Table 21

The main directions of herbal medicine for diabetic retinopathy

We use the following method of treating myopia as an aid (V.F.Korsun, T.I. Yakimanskaya, E.V. Korsun, 2012).

1. Collection of herbs (parts):

Calamus root (chicory) - 4

Wormwood (Yarrow) Herb - 1

Sophora buds - 2

Eyebright (strawberry) herb - 4

Melilot grass (bacopa) 1

Cuff Grass (chestnut) - 3

Saffron (arnica) flowers - 1

Astragalus herb - 3

Mix. Pour 1 teaspoon of a mixture of herbs with a glass of boiling water, leave for 60 minutes, strain and, without sweetening, drink 70 ml before meals during the day .

2. Tinktal (a mixture of aloe juice and honey) 1 teaspoon - 1 tablespoon 3 times a day.

3. Ham (peach, brahmi, nettle, lemongrass, leuzea, calamus, linden, saffron, meadowsweet, marigold, eyebright, astragalus, hawk, strawberry, sophora, milk thistle) 1–2 tablets 3 times a day 10 minutes before meals …

4. Acupressure massage of the periorbital region with apilak ointment for 2 minutes, 2 times a day for 2 months.

5. A modified 16th century recipe for improving vision. You should take 50 ml of grepol (an aqueous-alcoholic extract of green fruits of a walnut, birch buds, licorice roots and burnet, wormwood herb, clove buds, tansy flowers and Icelandic moss thallus), add 50 ml of warm boiled water and 1 tablespoon of buckwheat … Stir all components and instill 2-3 drops in each eye 2-3 times a day. The product should be stored in the refrigerator.

Using this technique, we observed 19 patients with type 1 diabetes with severe manifestations of angiopathy. After 3.5 months of treatment, the somatic parameters and visual acuity data improved.

For illustration, we present an extract from the medical history.

An example from practice. *Patient N., 28 years old, resident of the village of Mikhnevo, Stupinsky district, Moscow*

region. Suffering from type 1 diabetes mellitus for 17 years, a disabled person of the 2nd group. He complained of a sharp decrease in visual acuity, intermittent nature of blood glucose levels. He is periodically treated in the endocrinology department of MONIKI, where he was diagnosed with diabetes mellitus complicated by retinopathy with macular edema. He takes insulin up to 40 U and other antidiabetic drugs. The inclusion of the above-described herbal remedies in the complex of therapy after 2 months allowed to reduce the insulin dose to 12 U / day with a satisfactory general health and to increase visual acuity by 22.4 %.

Based on the mechanism of development of diabetic retinopathy, age-related changes in the retina, the data of traditional medicine in Russia, China, Azerbaijan and India, we have developed a traditional medicine “Okor”. Tablets are prescribed as a source of flavonoids and polysaccharides with a decrease in visual acuity 1-2 pieces 3 times a day 10 minutes before meals for 2-3 months.

Diabetic ketoacidosis, metabolic acidosis, oxidative stress

Despite the improvement in the organization of diabetic care in most developed Western countries, the incidence of diabetic ketoacidosis (DKA) in the general population of diabetic patients remains relatively constant and amounts to 0.0046 cases per patient per year (without division into type 1 and type 2 diabetes).), and the average mortality in DKA is 14 %. In Russia, the frequency of DKA in type 1 diabetes is 0.2–0.26 cases per patient per year. In the pathogenesis of this condition, an important role is played by the pH value (synonym - acid-base balance).

The ratio of acid and alkali in any solution is called acid-base equilibrium (ACB), although physiologists believe that it is more correct to call this ratio the acid-base state.

KShR is characterized by a special indicator of pH (power Hydrogen), which shows the number of hydrogen atoms in a given solution. At a pH of 7.0, one speaks of a neutral medium.

The lower the pH level, the more acidic the environment (from 6.9 to 0). An alkaline medium has a high pH level (from 7.1 to 14.0).

The human body is 70 % water, so water is one of the most important parts of it. The human body has a certain acid-base ratio, characterized by pH (hydrogen) index.

The pH value depends on the ratio between positively charged ions (forming an acidic medium) and negatively charged ions (forming an alkaline medium).

The body constantly strives to balance this ratio, maintaining a strictly defined pH level. When the balance is imbalanced, many serious diseases can occur.

The role of chronic hyperglycemia in the development of late complications of diabetes is generally recognized. Fasting and postprandial hyperglycemia, as well as acute fluctuations in glucose content, lead to excessive glycosylation and activation of oxidative stress (OS), which contributes to the development and progression of diabetes complications.

Metabolic acidosis develops due to the increased flow of ketone bodies into the blood, due to insulin deficiency. Metabolic disorders in diabetes mellitus (DM) are accompanied by such disorders as tissue hypoxia, dyslipidoproteinemia, hormonal imbalance, metabolic acidosis, angiopathies, electrolyte disturbances, etc. A decrease in the amount of essential trace elements involved in the regulation of carbohydrate metabolism aggravates the course of the disease and promotes rapid development vascular complications.

Acidosis can be very mild and even temporary (compensated) in its initial stages. And very strong (not compensated) and dangerous with its full development (N. A. Tyukavkina, Yu. I. Baukov, 1993). A large number of intermediate states can exist between these two extreme states.

A strong state of acidosis, observed in certain diseases, develops only after acid toxemia has so affected the organs that metabolism has been seriously impaired. It does not matter whether the increased acidity (hypoalkalosis) is a consequence of the accumulation of acidic residual products of protein metabolism or the consumption of too much of the body's bases as a result of the development of acidic fermentation in the gastrointestinal tract or the consumption of excessive acid-forming and poor alkalis food or the intake of acidic medications … The result will be the same: the beginning is a low alkali content, and the end is a dysfunction in proportion to the degree of hypoalkalosis with progressive development towards serious organic disease and death.

Symptoms of acidosis are fatigue, headaches, loss of appetite, drowsiness, general nervousness, increased stomach acidity, acid sweating, bad mood and frequent ailments like colds, and other phenomena.

The cause of acute DKA is absolute or severe relative insulin deficiency. The reasons for absolute deficiency can be:

• Newly diagnosed type 1 diabetes (insulin-dependent);

• Concomitant diseases, operations, injuries, etc. in type 1 diabetes;

• Interruption of insulin therapy for type 1 diabetes (iatrogenic or by the patient himself);

• Pancreatectomy in persons who have not previously suffered from diabetes.

The reasons for severe relative insulin deficiency include:

• Insufficiently treated type 2 diabetes (insulin-dependent diabetes);

• Concomitant diseases, operations, injuries, etc. in type 2 diabetes;

• Secondary depletion of insulin secretion in long-term type 2 diabetes;

• The use of drugs - insulin antagonists (cortisol, diuretics, estrogens, gestagens).

Common symptoms of DKA include dry skin and mucous membranes, polyuria, thirst, weakness, weakness, lack of appetite, nausea, vomiting, lethargy. In the future, clouding of consciousness, visual impairment, coma (loss of consciousness), and Kussmaul breathing develop. In all cases of acute abdomen or dyspeptic phenomena in a patient with diabetes, it is necessary to determine glycemia and acetonuria (N. A. Tyukavkina, Yu. I. Baukov, 1985).

Treatment. Inpatient treatment includes rehydration, insulin therapy, correction of electrolyte disturbances, and correction of acidosis. The administration of sodium bicarbonate increases hypokalemia, intracellular acidosis, and its routine use is not recommended.

Herbal medicine for metabolic acidosis is a secondary, additional component of the complex treatment of patients with diabetes. Since insulin is the only etiopathogenetic treatment for acute diabetic decompensation with hyperglycemia and ketoacidosis, the recommendations for eating lemons or oatmeal for acetonuria or more pronounced signs of ketosis are not based on anything. The “antiketogenic effect” of carbohydrates, which is so often mentioned in domestic works on diabetology, could serve as an argument in the pre-insulin era, when there was nothing to eliminate the lack of insulin in the body. If the patient can eat by this time, it is better to replace the introduction of glucose with the intake of carbohydrate-containing foods (EP Starostina, 2001).

Carbohydrates, including easily digestible ones, will serve as an independent remedy only with the so-called hungry acetone or ketosis of starvation. It does not belong to the concept of “acute diabetic decompensation” and is observed in both diabetic patients and those without diabetes with insufficient intake of carbohydrates from food. With diabetes, a similar phenomenon can occur if the patient, following illiterate recommendations, sharply limits the intake of any carbohydrates, and in healthy individuals - with a decrease in carbohydrate intake, for example, in order to reduce body

weight. Since the body does not receive enough carbohydrates, the main source of energy, the breakdown of fat begins in its own fat depots. Acetonuria and minor ketonemia, combined with normal or low blood glucose values, do not pose a threat to life.

K.V. Sivak (2006) evaluated the effect of lespeflan, lactyr, dry extract of caragana and infusion of camel thorn herb (CBC) on the state of the antioxidant system and lipid peroxidation processes during oxidative stress. Oxidative stress was simulated by intraperitoneal injection of mercuric chloride in 150 white rats. In the experimental groups, a significant decrease in lipid peroxidation in terms of malondialdehyde with the introduction of Lespeflan at a dose of 2.5 ml / kg by 26–33 %; total antioxidant activity - by 39 %, caragana extract - by 27–56 %, lactyra - by 32–40 %. The use of lespeflan, lactyr, caragana extract and camel thorn infusion reduced the intensity of free radical processes during oxidative stress, which gives reason to use them for the prevention and adjuvant therapy of acute and chronic nephrotoxic processes, including diabetes.

As you know, a person consumes food of both animal and plant origin. These products differ in their acid-base index, while the acid-base balance of the body must be constant, and the blood pH (pH) must always be in the range of 7.35-7.45. A person is healthy only if his homeostasis (acid-base balance, constancy of the internal environment) is not disturbed.

A shift in blood pH in any direction triggers the mechanism of a particular disease. So, reducing it to 7.0 or to 6.0 gives rise to the processes of putrefaction and acidification in the body. And the person gets sick.

For example, cancer cells arise at a pH of 5.55. And at pH 5.4 of blood, even death is possible. It has been proven that if an oncological tumor is placed in an acidic environment, it continues to develop, if in an alkaline one, it quickly dies. In other words, a decrease in pH is acidification of the body, and an increase in this indicator is alkalization.

How to determine in which direction the acidity in your body is shifted? The first sign is taste preferences. If you are

attracted to acidic, it means that there is a lack of acid in the body and a shift towards the alkaline side. If you want something sweet, it means that the body has an excess of acid and a lack of alkali. A healthy person can include a quarter of acidic foods in their diet, the other three quarters should be alkaline. If he is sick, then there has been a shift in pH to the acidic side and you need to switch to alkaline food, and sharply limit the acidic one. In case of serious diseases (diabetes mellitus, etc.) and oncology, it is better to exclude it altogether.

"Sour" foods (that is, creating an acidic environment in the body, their pH is below 7): meat - 3.98; fish - 3.76-5.78; bird - 4.34; eggs - 6.45; cereals - 5.52; cheese - 5.92; white bread - 5.63; black coffee - 5.59; tea - 4.26; beer - 6.19. "Sour" products also include animal fats, fish oil, sugar, buckwheat, rice, rye, millet, wheat, pasta, premium flour and products from it, mayonnaise, cheese, canned, fried, refined food, sweets, tap water … Sulfur, phosphorus, chlorine, copper acidify the body.

"Alkaline" products (that is, creating an alkaline environment in the body, their pH is 7 and higher): "living" water (melt, silicon, spring) - 9.5; corn oil - 8.4; soybean oil - 7.9; olive oil - 7.5; fresh cabbage - 7.5; honey - 7.5; persimmon - 7.5; germinated wheat - 7.4; potatoes - 7.5; melon and avocado - 7.4; carrots - 7.2; beets, watermelon and salad - 7.0.

Sodium, silicon, potassium, calcium, magnesium, selenium, fluorine, iodine, as well as alkaline mineral waters and "living" water obtained with the help of an activator (a device for making "living" and "dead" water) increase the pH.

Many plants also have alkaline properties: oregano, centaury, burnet, coltsfoot, plantain, motherwort, cumin, succession, eucalyptus, immortelle, valerian, elecampane, St. John's wort, calendula, nettle, linden blossom, raspberry, mint, dandelion, birch and pine buds, chamomile, dried cress, yarrow, thyme, celandine, sage, etc.

Alkaline blood is the owner of immune forces. Alkaline radicals of vegetables, fruits, berries, herbs neutralize the

harmful effects of acid radicals of animal products and grains.

Therefore, in the summer, you need to add young leaves of beets, carrots, dandelions, woodlice, knotweed (bird knotweed), nettles, desiccation, linden, maple, clover, parsley, celery, dill to salads. And these salads are combined with animal proteins (meat, poultry, fish, cheese), which create an acidic environment in the body. For the winter, these herbs can be dried and used as teas.

Plant food restores acid-base balance, heals the body. The living is treated with live products - fruits, vegetables, grains, seeds, nuts, dried fruits, berries, fresh juices.

Live foods are not stored for years, they are not processed into canned food, they do not contain food additives. They make the mind sharper, charge the human body with strength and energy, and postpone old age.

Canned food increases the risk of diabetes, hypertension, arthritis, insomnia, and various cardiovascular pathologies. This once again proves the truth of the popular wisdom: “Not everything is useful that got into the mouth.”

Diabetic cardiopathy

Chronic complications of diabetes mellitus can be divided into microvascular, characteristic exclusively of the state of carbohydrate metabolism disorders (diabetic nephropathy, retinopathy, neuropathy), and macrovascular, which can also be present in persons without diabetes.

Microvascular complications develop equally frequently in both type 1 and type 2 diabetes mellitus, as a result of the interaction of a number of metabolic, genetic and other factors, among which the factor of hyperglycemia is of the greatest importance. Epidemiological and prospective studies indicate a direct relationship between the level of glycemia and the degree of progression of microvascular complications.

Evidence that the factor of hyperglycemia underlies various manifestations of microvascular complications is evidence of combined damage to the fundus and kidneys, and the peripheral nervous system.

Thus, the risk of developing the proliferative stage of diabetic retinopathy is 5–10 times higher in patients with the proteinuric stage of nephropathy.

Changes in the system of small vessels (microangiopathy) are functional and structural (thickening of the basement membrane of capillaries). Significant functional disorders are increased vascular wall permeability, hemodynamic disorders, changes in blood viscosity, and platelet dysfunction. The thickness of the basal membrane correlates with the pressure inside the capillary system. In patients with diabetes mellitus, there is an accumulation of collagen, a decrease in proteinlycan sulfate, chondrotin, as well as glycoproteins such as laminin and enactin (MI Balabolkin, EM Klebanova, VM Kreminskaya, 2000). Hyperglycemia leads to an increase in intracellular reserves of protein kinase C. The latter plays an important role in ensuring the function of cells in a number of key areas, including signal transmission from hormones, growth factors, and drugs to intracellular structures; in smooth muscle cells of the vascular wall modulates DNA synthesis, hormone receptor activity.

Increased capillary permeability and hemodynamic disturbances precede structural changes in the capillary wall. The most indicative are the increase in intraglomerular pressure and urinary albumin excretion in response to hyperglycemia with poor metabolic control of the disease (D.B. Balzhirov et al., 2011).

Hemodynamic disturbances lead to an increase in intracapillary pressure, which contributes to the development and progression of diabetic nephro- and retinopathy.

The role of increased glomerular permeability in the pathogenesis of diabetic nephropathy is beyond doubt. In diabetes mellitus, subclinical albuminuria is a predictor of subsequent proteinuria and the development of renal failure (D.B. Balzhirov et al., 2011).

Treatment. In the arsenal of clinical medicine, there is a lack of drugs that can reduce the severity of cardiovascular complications in diabetes mellitus. The most promising drugs in this regard are extracts of ecdysteroid-containing plants: extract of safflower leuzea (ELS), extract of chalcedony lychnis (ELKh), and extract of crowned sickle (ESV). AS Vasiliev, MB Plotnikov, OI Aliev (2006) and others experimentally substantiated the effect of ecdysteroid-containing extracts on the hemorheological status of rats with alloxan diabetes. A model of diabetes mellitus was reproduced by intraperitoneal administration of alloxan at a dose of 90 mg / kg daily for four days. Animals with a glucose level of 16–22 mmol / L were selected for the experiment. The investigated extracts were administered at a dose of 150 mg / kg intragastrically for 14 days. The following hemorheological parameters were assessed: the viscosity of blood and plasma on an AKR-2 rotary hemoviscometer; aggregation of erythrocytes by the method of sillectometry; deformability of erythrocytes - by ectacytometry; plasma fibrinogen concentration by the Klauss photometric method; hematocrit - by centrifugation. The hemorheological parameters of rats with alloxan diabetes significantly differed from those of intact animals. Thus, in comparison with the values in intact animals, by the 14th day after the reproduction of alloxan diabetes, the blood viscosity at shear rates of 3–300 s – 1 increased by 19–47 %. The aggregation of erythrocytes increased by 45 %, the concentration of fibrinogen in plasma - by 44 %. The deformation properties of erythrocytes in the range of shear rates of 90–890 s – 1 decreased by 17–34 %. The course application of ELS contributed to the normalization of hemorheological parameters, which was expressed in a decrease by the 14th day after the onset of diabetes in blood viscosity in the shear rate range of 3–300 s – 1 by 5–22 %. During this period, ESV also significantly reduced blood viscosity by 11–26 % in the entire studied range of shear rates. The decrease in blood viscosity when using ELH was statistically significant only in the range of low shear rates. When using ELS, the deformability of erythrocytes at shear rates of 90, 180, 360, 890 s-1 improved by 20, 20, 14 and 7 %, respectively. When using ELC, the deformability of

erythrocytes was significantly improved (by 11–19 %) only at high shear rates (360 and 890 s-1). The effect of ELS and EBL on glucose concentration, plasma viscosity, erythrocyte aggregation and fibrinogen concentration was insignificant. In turn, ESP significantly reduced the fibrinogen concentration by 8 %, the hematocrit by 4 % and the glucose concentration by 12 % compared to the values in the control group.

Thus, extracts from ecdysteroid-containing plants can effectively reduce the severity of hemorheological disorders in alloxan diabetes in rats. Under the conditions of a diabetes mellitus model, ESV demonstrated the highest hemorheological activity and significantly reduced the degree of hyperglycemia.

For the treatment of the disease, we recommend using the following technique, consisting of plants with pharmacotherapeutic action: antiatherosclerotic, antianginal, vasodilator, diuretic, containing potassium, toning the cardiovascular system, regulating cardiac activity; metabolism correctors, antioxidants, etc.

The purpose of herbal medicine. The goal is to reduce side effects from prescribed chemotherapy drugs, lengthen the relapse period, prevent kidney wrinkling, restore kidney function and urination, accelerate the healing process, and improve the quality of life.

The main directions of herbal medicine for diabetic cardiopathy are presented in table. 22.

Table 22

The main directions of herbal medicine for diabetic cardiopathy

Recommended treatment algorithm

1. To prepare the infusion (in grams):

Motherwort herb five-lobed - 10.0

Astragalus herb woolly - 15.0

Sandy immortelle flowers - 25.0

Horsetail herb - 50.0

For a day - 2 g of collection per 200 ml of boiling water.

2. Elastinol 1 capsule 3 times a day with meals.

3. Superantitox 1 capsule in the morning and evening with meals.

4. Fito Novo-sed 2.5 ml morning and evening (add to herbal tea).

Diabetic hypertension

In patients with diabetes mellitus (DM) with arterial hypertension (AH), modern guidelines provide for a more intense reduction in blood pressure (BP) using any

antihypertensive drugs. In addition, there is evidence that angiotensin-converting enzyme (ACE) inhibitors and angiotensin II receptor blockers further reduce the risk of developing and progression of diabetic nephropathy.

Treatment. Traditional antihypertensive therapy involves the gradual titration of the dose of drugs, the addition of new drugs if necessary, and, therefore, frequent monitoring of the effectiveness and side effects. As a result, many diabetics do not reach their blood pressure targets.

The purpose of herbal medicine. Reducing side effects from prescribed chemotherapy, lengthening the relapse period, preventing severe forms of arterial hypertension, accelerating the healing process, improving the quality of life.

The main directions of herbal medicine for diabetic hypertension are presented in table. 23.

Table 23

The main directions of herbal medicine for diabetic hypertension

Plants with recommended pharmacological properties

1. Collection from medicinal plants (in parts):

Flowers of prickly hawthorn - 2

Horsetail herb - 3

Yarrow herb - 2

Dill seeds - 2

Mother-and-stepmother leaves - 2

Marsh cinnamon grass - 5

Motherwort herb five-lobed - 4

Mix. Pour 1 teaspoon of a mixture of herbs with a glass of boiling water, leave for 1 hour, strain and take 100 ml 2 times a day. The course of treatment is 2 months.

2. Elastinol (cranberry powder, garlic and strawberry herb) 1 capsule 3 per day with meals - 3 months.

Antioxidant phytopreparations for diabetes mellitus

Taking into account the peculiarities of the pathogenesis of diabetic retinopathy, they may in the future become a promising direction for the prevention of the progression of diabetic retinopathy. The role of oxidative stress, with an increase in lipid peroxidation and depletion of antioxidant defense mechanisms, is recognized as one of the mechanisms for the development of complications of diabetes mellitus, including diabetic retinopathy (N.N.Borovkov, M.I.Balabolkin, G.P. Runov et al. . 2006).

Many plants have an antioxidant effect, therefore their use in the complex therapy of diabetes mellitus is of great importance for maintaining the residual function of beta cells, and their use should be constant. Studies have shown that medicinal herbs not only have a positive effect on the state of carbohydrate metabolism in patients with non-insulin dependent diabetes mellitus. When using the antidiabetic collection of medicinal herbs, patients receiving insulin therapy showed a more stable course of the disease, which made it possible to reduce the insulin doses required to compensate for diabetes mellitus. The antidiabetic collection has a beneficial effect on the function of the gastrointestinal tract. Thus, herbal medicine or treatment with medicinal herbs is successfully used in the treatment of diabetes mellitus, and

in some cases it is possible to completely switch to therapy with herbs, in others it is possible to significantly reduce the dose of oral hypoglycemic drugs, and in some cases the dose of insulin (S.M. Nikolaev, I.I.Ubeeva et al., 2005). However, it should be noted that it is not always possible to completely transfer patients to treatment with medicinal herbs and to abandon the use of synthetic medicinal preparations. Phyto therapy, however, should take its place. A decrease in the concentration of glutathione peroxidase in the tissues of the eyes of patients with an increase in the duration of diabetes mellitus was shown.

It is also recommended to use shock doses of *tocopherol* (1200 mg per day) in the treatment of such patients . The use of antioxidants is explained by the fact that “the nonproliferative stage of diabetic retinopathy in patients with type 1 diabetes mellitus is combined with a pronounced activation of lipid peroxidation, apparently associated with a deficiency of the antioxidant system.” The positive effect of therapy lasts up to 3 months.

Polyunsaturated fatty acids are also used as an antioxidant. Currently, it is recommended, in particular, the use of this drug in the complex preparation of patients with non-insulin dependent diabetes mellitus and atherogenic hyperlipidemia to laser coagulation of the retina.

Pycnogenol (a flavonoid of the bark and needles of seaside pine or grape seed extract) is a source of proanthocyanids, which are 50 times more active in antioxidant activity than vitamin C and 20 times more active than vitamin E. Reduces the manifestations of allergic and inflammatory reactions by reducing the production of histamine in tissues, prolongs the action of vitamin C, has an antispasmodic effect, is a natural anticoagulant, helps to reduce capillary fragility.

In our practice, we give preference to an aqueous extract of fir needles (florente), dihydroquercetin (DHA).

Long-term studies carried out at the Research Institute of Pharmacology, the I.M.Sechenov First Moscow State Medical University of the Ministry of Health of Russia and the Siberian

State University, have confirmed that dihydroquercetin is indicated for use as an additional agent for cardiovascular diseases, bronchopulmonary pathologies, and also as a prophylactic agent for slowing down aging of the body. DHA inhibits the processes of lipid peroxidation of cell membranes and lipoproteins of blood serum, prevents the damaging action of free radicals, reactivates sulfhydryl compounds and vitamin C, glutathione, tocopherols, prevents the transition of adrenaline to toxic adrenochrome.

Dihydroquercetin is a reference direct-acting antioxidant, significantly superior in its properties to all other natural antioxidant products, not to mention the synthetic ones that have flooded the pharmaceutical market. The effect of its use is several orders of magnitude higher than that of taking the well-known vitamins A, C, E and P.

It was noted that DHA increases the resistance of body tissues to the damaging effects of excess blood sugar, reduces the level of glycated hemoglobin (http://www.aquabionica.pro):

• reduces the risk of developing complications of diabetes mellitus and the progression of micro- and macroangiopathies;

• shows a positive therapeutic effect on the development of diabetic retinopathy;

• increases the sensitivity of peripheral tissues and, first of all, the liver to circulating insulin, causes an increase in the ability to absorb glucose and reduces gluconeogenesis, which leads to a decrease in total blood sugar and an improvement in metabolism.

Phytolectins in the treatment of diabetes mellitus

Wishing to avoid diabetic nephropathy, one should pay attention to biologically active substances - lectins (Savitskene

N., Savickas A., Ragazhinskene O., 2006).

Lectins are glycoproteins that regulate the metabolism of carbohydrates and proteins, regulate glycogen synthesis, while simultaneously reducing blood sugar (Beuth J., 1996). Lectins accumulate in many legumes (*Fabaceae*), for example, in common beans (*Phaseolus vulgaris L.*), in white acacia (*Robinia pseudoacacia L.*), in gorse (*Genista tinctoria L.)* (Bog-Hansen TC, Spengler GA, 1983). In addition, lectins are found in the bark, in the fruits and flowers of black elderberry (*Sambucus nigra L.*), and in the shoots of white mistletoe (*Viscum album L.*). The mentioned plants stimulate diuresis. Lectins of the corresponding plant specifically react with different carbohydrates, forming complex compounds, thus reducing the content of carbohydrates in the blood (Sharon N., 1977).

The role of animal lectins in the recognition of individual tissues by cells, which are associated with the action on them of such biologically active compounds as hormones, is also undoubted. Hormones regulate the body's metabolism. Together with the nervous system, they seem to conduct metabolic processes in human and animal organisms. The role of lectins in the manifestation of certain biological effects is due to their interference in the mechanism of hormone binding to tissue receptors. This is especially evident in the influence of many plant lectins on the mechanism of action of such an important hormone as insulin (insulin is a protein hormone of the pancreas of humans and animals, which is involved in the regulation of carbohydrate metabolism in the body). According to Quatrekasses' data obtained in the early 70s, WGA and ConA have the ability to bind to insulin receptors in cells and thereby affect the regulation of glucose metabolism in the animal body. It has also been established that endogenous lectins can alter the functioning of the so-called ion channels in the membrane and thus affect a series of metabolic reactions.

A. V. Ushakov, E. Yu. Shapovalova (2011) studied the repression and derepression of glycopolymers - lectin receptors on the surface and in the cytoplasm of cells and tissue extracellular structures of the human left ventricular

myocardium in normal conditions and in diabetes mellitus. The studies were carried out in four persons who died suddenly from noncardiac causes and did not suffer from heart disease, and seven patients with type 2 diabetes mellitus, whose cause of death was also an extracardiac pathology.

The survey preparations were stained with hematoxylin and eosin. Glycopolymers of cells and non-cellular tissue structures were detected by treatment of serial sections with lectins of wheat germ, black elderberry, peanuts, golden rain, soybeans, and lentils conjugated with horseradish peroxidase. The preparations were processed using standard sets of NPK "Lektinotest", Lviv, at a dilution of lectin 1:50 according to the recommended method (A. D. Lutsik, 1989). The visualization of the lectin binding sites was performed in the diaminobenzidine - hydrogen peroxide system. The intensity of the developed reaction is from light to dark brown coloration. The specificity of the reaction was controlled by excluding diaminobenzidine from the treatment scheme (T. Shimoike, 2000). Black elderberry lectin (SNA) is specific to the terminal non-reducing residues of N-acetylneuraminic (sialic) acid of glycopolymers; wheat germ lectin (WGA) is specific to N-acetylneuraminic acid and to a lesser extent to N-acetyl-D-glucosamine; peanut lectin (PNA) is specific for β-D-galactose; golden shower lectin (LABA) is specific for α-L-fucose; lentil lectin (LCA) is specific for α-D-mannose.

Changes in diabetes mellitus in the myocardium of the left ventricle are expressed in a regular redistribution of the number of receptors for lectins of wheat germ, peanuts, lentils and black elderberry in the endothelial cells of blood capillaries, both towards expression and towards their reduction.

It was noted that diabetic angiopathy significantly changes the number of binding sites of the studied lectins in the vascular endothelium, which leads to a natural reduction of sialo, N-acetyl-D-glucosamine conjugates in the cytoplasm of contractile cardiomyocytes and α-L-fucose conjugates in the nuclei of the same cells.

The fruiting bodies of the shaggy dung beetle (*C. comatus*) have been successfully used in the treatment of diabetes mellitus in humans. At the same time, a sharp decrease in blood sugar was noted. Compounds that cause a decrease in the blood sugar content of experimental animals are isolated from the fruiting bodies of *G. lucidum* . In fungi of the genus *Agaricus* , lectins have been found that promote the conversion of proinsulin into insulin.

For enzymes of plant origin - papaya enzymes, papains isolated from a plant (*Carica papaya L.*), and bromelain isolated from pineapple (*Ananas comosus L.*), antioxidant activity is also characteristic (A.V. Ushakov, E. Yu. Shapovalova, 2011). These enzymes are used for indigestion, dyspepsia, chronic gastritis. In diabetes mellitus, complications of the digestive tract occur: gastric secretion decreases, functional morphological changes are often noted (chronic gastritis and atrophy of various degrees of gastric glands). Both papain and bromelain are proteolytic enzymes that break down proteins anywhere in the digestive tract.

For diabetes mellitus, we especially recommend medicinal plants containing glycokinins (blueberry leaves, plantain leaves, beans, stachis and many others). We pay special attention to macromycetes. The medicinal properties of mushrooms are due to the presence of specific polysaccharides in the fruit bodies, such as beta-glucans and chitosans. Beta-glucans belong to the family of polysaccharides of D-glucose monomers linked by beta-glycosidic bonds. Beta glucans do not undergo enzymatic fragmentation in the gastrointestinal tract. They are captured by the cells of the intestinal mucosa and are actively transferred to the submucosa, interact with macrophages using specific receptors, activate them, and through them lymphocytes responsible for endothelial protection, that is, for mesitic immunity (Young et al., 2001). On the one hand, the phagocytic function of macrophages is activated, on the other, cytokines (interleukins, interferon, tumor necrosis factor-alpha, angiogenesis factors, epidermal cell growth factor), which are a signal for other cells of the immune system, for example, T-lymphocytes (Lenne et al., 2006).

Part of the beta-glucans with blood flow through the portal vein enters the liver, where they are captured by Kupffer's cells, which, in response to interaction with polysaccharides, release cytokines that activate systemic immunity (Sandula et al., 1995).

One of the options for phytotherapy of patients with diabetes mellitus using lectins, we have proposed the following method (V.F. Korsun et al., 2007).

Recommended treatment algorithm

1. Collection of herbs (parts):

Grass grasses - 2

Ivan tea herb - 4

Corn silk - 1

Sage Leaves - 1

Raspberry leaves - 2

Burdock roots - 2

Leuzea herb - 2

Mix. Pour a teaspoon of the herbal mixture with a glass of hot water in the evening, insist overnight, slightly warm it up in the morning and drink it during the day without sweetening.

2. Diacor 2 tablets 3 times a day before meals.

3. Florenta (coniferous extraket of fir needles) add a teaspoon to herbal tea.

Hypoxia and diabetes mellitus

Hypoxia (other - Greek *ὑπό* - under, below + Greek οξογόνο - oxygen) is a state of oxygen starvation of both the whole body as a whole, and individual organs and tissues, caused by various factors: breath holding, painful conditions, low oxygen content in atmosphere. Due to hypoxia,

irreversible changes develop in vital organs. The most sensitive to oxygen deficiency are the central nervous system, heart muscle, kidney and liver tissue. Can cause the appearance of an inexplicable feeling of euphoria, leads to dizziness, low muscle tone (EE Lesiovskaya, LP Pastushenkov, 2003).

The decrease in the adaptogenic capabilities of the organism in diabetes mellitus, associated with the influence of numerous extreme factors, has led to a widespread increase in the incidence among the population.

Adaptive reactions during hypoxia (as well as hypoxia itself) are nonspecific and are involved in the process in all forms of oxygen starvation of tissues in diabetes mellitus. However, the volume, as well as the time of their initiation and the order of switching on, are determined by the specific mechanisms inherent in one or another type of hypoxic state.

With prolonged hypoxia in patients with diabetes mellitus, despite the inclusion of sufficiently powerful sanogenetic mechanisms, structural pathological changes may develop in the organs, which will not disappear with the elimination of hypoxia. In diabetes mellitus, with increased blood sugar, glycated hemoglobin is formed and the function of the blood to carry oxygen by hemoglobin is impaired. In case of insufficient oxygen supply to tissue cells, free radicals are formed, which trigger a cascade of peroxidation reactions that destroy cells. Deficiency of oxygen supply to tissues causes disturbances in metabolism and reduces the bioenergetic potential of the body.

According to K.A. Treskunov (2009), one of the most common causes of diabetes mellitus and the main factor in its development is inflammation of the duodenum (acute and chronic duodenitis).

Phytotherapy. The first works on the study of the antihypoxic properties of medicinal plants were devoted to preparations of plant adaptogens. A targeted search for phytoantihypoxants quickly led to success. During the first decade of work (1981–1991), more than 500 types of medicinal plant raw materials were identified in SPKhFA

alone, the extracts from which had the properties of antihypoxants (L.V. Pastushenkov, E.E. Lesiovskaya, 1991; L.V. Pastushenkov, E . E. Lesiovskaya, 2003).

According to the authors, according to the severity of the effect, antihypoxic plants can be divided into the following main groups (unofficial plants are marked with an asterisk):

Means of pronounced action. Marsh calamus, mountain arnica, astragalus malt, astragalus woolly, drooping birch, hawthorns, borage *, common camel thorn *, sweet clover, branched starweed *, medium starweed *, milky white iris *, narrow-leaved fireweed * stinging nettle, cinquefoil goose *, heart-shaped linden * (leaves), lemon balm, common cuff * (herb), medicinal soapwort *, oats, oats *, mountain ash, blue cyanosis, black currant * (leaves), marsh clown, field horsetail, marsh chisel *, alpine chisel, forest chisel *, white chisel *.

Means of moderate action (the effect is comparable to that of reference antihypoxants). Common quince, actinidia kolomikta *, marshmallow, common anise, high aralia, watermelon *, sandy immortelle, common lingonberry, black elderberry, blue cornflower, medicinal verbena *, common heather *, cultivated grape *, multifilament buckle *, clove tree * , ginkgo biloba, ginseng, mountaineer, poultry mountaineer, buckwheat, hernia smooth, elecampane high, oregano, medicinal smoke, common ginseng, wild strawberry, canadian goldenrod *, pharmacy ginger *, calendula vulgaris, carida , meadow clover *, coriander sowing, scepter mullein, medicinal burnet, turmeric long *, meadowsweet, six-lobed meadowsweet, narrow-leaved lavender, noble laurel *, erect cinquefoil, leuzea safflower, large flax, Chinese lavender coltsfoot, peppermint, buckthorn buckthorn, medicinal dandelion, shepherd’s purse, spring primrose, common plantain, large plantain, creeping wheatgrass *, pharmacy burdock (common agrimony), pink rhodiola, pharmaceutical chamomile, odorous celery *, cultivated soybean *, vulgaris common *, licorice, naked, field stew, thyme, creeping thyme, black poplar, common yarrow, common hops, common chicory, three-part succession, common blueberries, celandine, Baikal skullcap, ball eucalyptus.

When choosing phytopreparations for the implementation of the basic principles of therapy in a particular patient, it is necessary to take into account the severity of the antihypoxic effect of specific drugs, the availability of the remedy, as well as clinical and experimental confirmation of the therapeutic effect. In our practice, we widely use dry extract of birch bark (diabetuline), florenta (aqueous extract of fir needles, as well as dihydroquercetin (capilar, taxifolin) from larch wood (V.F.Korsun, E.V. Korsun) in the treatment of patients with diabetes mellitus (V.F. 2010).

Diabetuline contains dry birch bark extract, blueberry fruits, rhizomes with elecampane roots. It has been proven that birch bark extract exhibits a tonic, anti-inflammatory, nootropic, antioxidant, antihypoxant, hepatoprotective, hypoglycemic, anti-inflammatory, immunomodulatory, adaptogenic and oncoprotective effect (H. H. Sharafetdinov et al., 2006).

Betulin (the main component of Diabetuline dietary supplement) balances intracellular ionic homeostasis by stabilizing the plasma membrane and membranes of intracellular organelles, as well as activating the main detoxifying enzyme, cytochrome P-450. This is indicated by the ability of betulin under hypoxic conditions to increase the level of cytochrome P-450 and the relative activity of monooxygenases, established at the Department of Biological Chemistry of the Pyatigorsk Pharmaceutical Institute.

The advantage of betulin is the fact that the number of antiviral drugs is limited; many immunomodulators cannot be widely used in clinical practice due to toxicity and side effects. For example, interferon preparations are distinguished by their short duration of action, the need to apply at the initial stage of the disease, and their high cost. Long-term use of interferon causes anxiety and irritability, acute psychoses and attempts at suicide. Ribavirin causes severe anemia. “Diabetuline” helps to normalize carbohydrate and fat metabolism, maintain the functions of the pancreas, liver and biliary tract, improves the state of the body in diabetes. The herbal remedy helps to

reduce triglycerides in the blood, significantly accelerates the restoration and regeneration of the walls of blood vessels, and increases the effectiveness of special sugar-reducing drugs (http://bioimpulse.ru). It is important that “Diabetuline” helps to increase the patient’s mood by its direct beneficial effect on the nervous system. The food supplement is applicable for diabetes mellitus complicated by micro- and macroangiopathies, as it exhibits antioxidant, angioprotective and hypolipidemic effects.

The effectiveness of herbal medicine is high in mild and moderate forms of hypoxic conditions. In acute and severe forms of oxygen deficiency, phytotherapy plays an auxiliary role and can increase the effectiveness and safety of pharmacotherapy in diabetes. However, the issues of compatibility of antihypoxants of synthetic and natural origin remain poorly understood, therefore, caution is required when carrying out such a complex treatment (EE Lesiovskaya, LV Pastushenkov, 2003).

The domestic experience in the prevention and treatment of hypoxic conditions in diabetes proves the promise of the phytotherapeutic approach. Thanks to the normalizing effect of herbal antihypoxants, adaptive capacities in diabetes are expanded, and resistance to various adverse effects increases. Due to the optimization of metabolism, phytoantihypoxants can optimize the treatment of patients, accelerate the onset of remission, and reduce the risk of complications of pharmacotherapy.

Stress and diabetes

The word “stress” (literal translation from English - “stress”) has become one of the most fashionable words of the XX century. The most profound understanding of the biological nature of stress was managed by the outstanding Canadian physiologist G. Selye. According to him, stress is a specific set of physiological reactions (adaptive stress response), which are essentially the same regardless of the

nature (nature) of the stress factor. The action of heat, cold, injury, illness, overwork, fear, poisoning, joy cause a stress response in the body to adapt to the situation. But an excessive or unbalanced stress response can cause serious damage in the body, leading to illness, and often the development of diabetes mellitus. The pathways of development of the stress reaction include the reaction of the nervous, immune, endocrine systems with changes in the circulatory system, etc. The longest somatic reactions to stressors are the result of activation of endocrine mechanisms in the composition of three axes: adrenocortical, somatotropic and thyrotropic.

Stress appears to be a factor in the development of prediabetes and type 2 diabetes. The presence of various forms of stress in diabetic patients: oxidative, emotional, etc.

According to an international meta-analysis (Anderson et al., 2001), the population of patients with diabetes mellitus is at least twice as likely to be depressed as healthy people. In the clinical picture of diabetes mellitus and depression, a number of common symptoms and syndromes can be distinguished: asthenia, pain syndrome, paresthesias, changes in appetite and weight, weakness, increased fatigue, emotional lability, exhaustion of processes, impairment of memory and attention (O.V. Vorobieva, 2013). Comorbid depression often leads to poor glycemic control and difficulties in correcting the course of diabetes mellitus. The risk of depression is especially high in patients with several somatic symptoms who regard their condition as very poor in a stable course of diabetes mellitus.

Untreated depression increases the risk of developing preventable complications in people with diabetes - cardiovascular diseases, retinopathy, neuropathy, adversely affecting disability rates. A prolonged course of stress aggravates the picture of depression in patients with diabetes and requires medical correction. However, most tricyclic antidepressants and dual-acting antidepressants can impair glucose control.

When any emotional stressor acts on the body, a nonspecific reaction in the form of a general adaptation

syndrome is triggered, which, in the case of a latent course, leads to the manifestation of diabetes, and in case of a genetic predisposition it causes the onset of the disease.

Stressors indirectly activate the hypothalamic-pituitary-adrenal system through the senses. The resulting series of effects affects the main pathogenetic links in the development of diabetes mellitus (insulin resistance and beta-cell secretory defect). Emotional states, as a rule, are accompanied by hyperglycemia due to increased glycogenolysis and gluconeogenesis. The resulting hyperinsulinemia with prolonged course leads both to insulin resistance, due to a decrease in the sensitivity of peripheral receptors to insulin and a decrease in their number, and to depletion of beta-cell reserves. Due to the decrease in compensation, chronic hyperglycemia, acting on the beta cell, leads to a decrease in insulin secretion, and the “glucose toxic effect” leads to its apoptosis.

These specific reactions, discovered by G. Selye, led to the development of an entire industry for the production of drugs that inhibit, stimulate, modulate, modify, prolong, etc., the state of stress. These drugs are used in various fields of medicine, nutritional therapy, alternative, complementary medicine, often using natural compounds from plants, etc. (IN Todorov, GI Todorov, 2003).

Under these conditions, modern pharmacological correction is of particular importance and is one of the important ways to maintain the relative constancy of the internal environment of the body and increase the level of human health. Correction can be achieved using both stimulants - doping and tonics. However, the effect of these two groups of substances on the processes of cellular metabolism is significantly different.

Tonics prevent violations of energy and plastic processes in tissues. The ability of such agents to activate the body’s defenses and thereby increase its resistance to extreme agents gave reason to single them out into a special group - adaptogens.

Adaptogens are groups of substances that contribute to the adaptation, nonspecific resistance of the body (N.V. Lazarev et al., 1959) to various harmful environmental factors (cold, heat, lack of oxygen, etc.). The effect of adaptogens is manifested through the central nervous system and the pituitary-adrenal system, as a result, an increase in muscle glycogen is observed, the content of protein and ribonucleic acid (RNA) in tissues increases, and the activity of oxidative enzymes increases.

The most famous adaptogens of plant origin, which are most widespread, include preparations from plants growing in the Far East and Siberia, which belong to the Araliaceae family: ginseng, Eleutherococcus, Manchurian aralia, Schisandra chinensis (I.I.Brekhman, 1968), and also preparations of Rhodiola rosea (A.S. Saratikov, 1974), Leuzea safflower (E.A. Krasnov, A.S. Saratikov, G.D. Yakutina, 1977) and some types of lichens (P.P.Denisenko, N. V. Fedorova, Yu. B. Kerimov, 1985).

The effect of adaptogens on body systems is determined by the specific structure and set of biologically active chemicals that make up their composition. So, for example, in plants-adaptogens, the active principle can be: polysaccharides, glycosides, flavonoids and glycopeptides.

Adaptogens are characterized by a corrective effect on body functions in various pathological conditions. Thus, ginseng and Siberian ginseng increase blood pressure during hypotension, reduce blood sugar levels in experimental diabetes, normalize deviations in various circulatory pathologies (IV Dardymov, 1976).

Even in the recommendations of traditional medicine of the countries of the East, the antidiabetic properties of ginseng roots are mentioned. Subsequently, it was noted that the use of a number of adaptogens leads to a decrease in the symptoms of the disease, a decrease in the level of sugar in the blood and urine (tab. 24), and an increase in the survival rate of animals.

Table 24

Influence of adaptogens on glucose and lipid content under conditions of acute stress

Recipe for syrups recommended for diabetics (functional foods)

Kh . Kh . Sharafetdinov et al. (2006) observed 27 patients with type 2 diabetes mellitus, in whom at the time of the initial examination, the level of glycemia in the venous blood was 9.2 + 0.6 mmol / l, in the capillary blood - 8.1 + 0.4 mmol / l … 15 patients of the main group, in addition to the hypocaloric diet, were prescribed Diabetuline for 3 weeks, 1 capsule 3 times a day before meals. The control group (12 patients) received traditional hypocaloric food. The inclusion of the drug in the dietary complex was accompanied by a decrease in basal and post-food glycemia by an average of 20.8 % compared with the control group; a decrease in the level of triglycerides by 22.5 % and diene conjugates, malondialdehyde and LPO index by an average of 38.1 %, which makes it possible to increase the hypoglycemic, antioxidant and hypolipidemic efficacy of type 2 diabetes mellitus treatment.

We have developed an auxiliary herbal remedy under the code name “Pills for the Mind”, which helps to reduce the manifestations of both stress and depression (V.F. Korsun, E.V. Korsun, D.N.Samsonov, M.A.Avkhukova, 2011) … It includes in its composition both tonic plants (ginger, Rhodiola rosea, Leuzea safflower, meadowsweet, Bacopa Monieri, chaga mushroom), as well as sedative and nootropic (Scutellaria

Baikal, Schizonepeta incised, Moldavian snakehead, Arnatus mountain, astragalus pea) actions.

According to the laboratory of experimental pharmacology OBAV IOEB SB RAS (S. M. Nikolaev, S. M. Gulyaev, Yu. V. Zhamsanov, 2012), course intragastric administration of a herbal remedy at doses of 100 and 300 mg / kg increases horizontal and exploratory activity animals in the Open Field test, moderately reduces the level of anxiety: it increases the number of exits to the light arms of the labyrinth and the time spent in them in the APL (elevated cruciform maze), improves memory indices in the passive avoidance reaction (passive avoidance reaction) test. As a result of the experimental studies, a nootropic, psychoactivating and moderate anxiolytic effect of a decoction from "Pills for Mind" was established (Tables 25, 26, 2).

Table 25

Influence of the "Mind Pills" decoction on the research activity of animals in the "open field"

***** here and below means differences compared to control at $p \leq 0.005$.

Table 26

Influence of the "Mind Pills" decoction on the behavior of animals in the cross-shaped raised maze

Table 27

The effect of a decoction of “Pills for the mind” on memory in the CPAR test

Mind pills are prescribed in 0.5 g in the morning and afternoon before meals for 4-8 weeks with the written consent of the family or patient. The herbal remedy was well tolerated. No unwanted effects were noted. After 2 months of taking the herbal remedy, the effectiveness was assessed. The indicators of the effectiveness of the herbal preparation were: the data of the clinical examination and the results obtained on the hardware-software complex “Neuro-KM” by the method of Doppler-topographic mapping of the electrical activity of the brain (D. N. Samsonov, 2010).

The addition of antidepressant, psychoactivating herbal therapy to the standard treatment regimen makes it possible to achieve a pronounced decrease in the symptoms of depressive disorder, significantly increases the effectiveness of the therapy of the underlying disease, improves the patient’s general condition and his perception of the tolerance of the therapy.

Phyto-dietology of patients with diabetes mellitus

Complex individually oriented therapy of diabetes mellitus allows to achieve compensation of metabolic disorders, prevents the progression of the disease and the development of complications. However, to a large extent, its success depends on the efforts of the patient himself, on the social and living conditions in which he lives, on the attitude of the people around him, nutrition (Table 28). Progress in the fight against this serious ailment cannot be achieved without efforts to develop a healthy lifestyle from childhood.

Table 28

List of basic food items to help you empty your bowels

At present, the principle of diet therapy is observed all over the world using a diet containing 50-60 % carbohydrates from the daily calorie content, 15-20 % proteins and 25-30 % fats. The main difficulty in the practical application of these recommendations is that patients, as a rule, have difficulty adhering to them. There are several reasons for this.

• Insufficient knowledge of patients with issues of diet therapy of diabetes mellitus. Patients often do not understand the importance of this type of treatment and do not have the practical skills to ensure they can follow the diet.

• When drawing up recommendations for diet therapy, sometimes they do not take into account the fact that human nutrition, in addition to the physiological aspect, has a great emotional impact and has an important social significance.

Nutrition is the only therapeutic factor for mild diabetes, the main one for moderate disease and a mandatory background for treatment with insulin and other drugs for severe diabetes (A.I.Dmitriev, B.L.Smolyansky et al., 1994).

The use of hypoglycemic plants in food and in the form of medicinal food mixtures is an important advantage compared even with the use of traditionally simple dosage forms based on plant raw materials (infusions, decoctions, tinctures). For life, daily, if not hourly, the patient must remember to take medication.

Many signs of the disease can be leveled or weakened if a patient with diabetes mellitus eats rationally, mindful of the diet and resorting to a wide range of herbal remedies. The patient can prepare some therapeutic and dietary products and dishes himself with certain advice and correction from an endocrinologist or phytotherapist.

At present, there has been a growing interest in modifying the diet therapy of type 2 diabetes with the inclusion of food products that correct disorders of lipid and carbohydrate metabolism.

The most interesting products used in the treatment of various diseases are amaranth and sunflower oils. Amaranth oil has a high biological activity. This is primarily due to the unusually high content of squalene (6-10 %), tocopherols (up to 1 %), phospholipids (up to 10 %), phytosterols (up to 2 %) and irreplaceable polyunsaturated linoleic acid (up to 50 %) (A.M. Makeev et al., 2002). Squalene plays the role of a regulator of lipid and steroid metabolism in the body (A.M. Makeev et al., 2002). Sunflower oil has a regulatory effect on all types of metabolism, including carbohydrate and lipid metabolism, and has been used in the treatment of type 2 diabetes mellitus (V.A.Meshcheryakova et al., 1999).

A.P. Volynkina (2008) found that unrefined sunflower press oil creates positive conditions for the normalization of hypertension. At the same time, the author found that diabetes therapy against the background of hypertension with the inclusion of amaranth oil in the diet has a pronounced positive effect on the clinical manifestations of the disease. So, dry mouth decreased in 14, itching of the skin - in 2, weakness - in 9, thirst - in 10, numbness of the feet - in 5, pain in the feet - in 2, headache and dizziness - in 4 patients. Blood pressure returned to normal in 6 out of 18 patients. The initial SBP level was 147.5 (140; 160) mm Hg. Art., DBP - 92.5 (80; 100) mm Hg. Art. After treatment, there was a statistically significant decrease in SBP to 135 (130; 140) mm Hg. Art., DBP up to 85 (80; 85) mm Hg. Art. respectively.

It was noted that the composition of oils based on amaranth and sunflower has a positive effect on carbohydrate metabolism, immune reactivity and, to a lesser extent, on lipid metabolism in patients with type 2 diabetes mellitus against the background of arterial hypertension.

When conducting diet therapy for patients with diabetes mellitus, one should not ignore the means of traditional medicine, rationally using wild medicinal plants. One example is the long-term experience of V. I. Korchan (1883–1973).

Patients with this ailment, he always gave to chew on fresh herbs such as elecampane and dandelion, young nettle, lungwort, hawthorn berries. He also suggested baking bread

with hawthorn berries added to flour and eating it. Very tasty and healthy!

For disinfection of wounds caused by diabetes, Iodine according to Korchan was used - lungwort juice. Vasily Iosifovich also grew Jerusalem artichoke (earthen pear) and flax. The pear was included in various dishes, and V.I.Korchan recommended putting flax into linen bags and using it instead of a heating pad. Hemp cloth and lint (fluff from it) were brought from the village of Korovintsy, Nedrigailovsky district, Sumy region - he also used them for powdering large and deep wounds.

V.I.Korchan (1964) recommended to include a large amount of dietary fiber (up to 40 g) in the diet of patients with diabetes mellitus . It slows down the absorption of carbohydrates from the gastrointestinal tract, preventing the increase in sugar after meals. Salt intake for such patients should be limited to a minimum or eliminated. It is necessary to provide the body's daily need for vitamins.

In order to unload the pancreas, he recommended fasting days. On an apple day, eat more than 1.5 kg of apples; on a meat day - boiled beef 0.5 kg, boiled cabbage 0.5 kg; on oatmeal day - porridge from oatmeal (300 g); on a curd-kefir day - cottage cheese (250 g) and kefir (0.5 kg).

Doctors of any specialty in their practice daily encounter patients suffering from this insidious and very controversial disease called diabetes mellitus (DM). Phytotherapists, herbalists, healers can confirm that such patients often turn to them. In a private conversation with patients, in the overwhelming majority of cases, it is confirmed that each home has its own "phyto-pharmacy" and the use of a decoction of blueberry, dandelion or other herbs is a daily norm for them. I cite this example in order to focus the readers' attention on the natural position of patients, they trust the natural remedies that nature has grown. In diabetes mellitus, herbs from the group of low-potency and vitamins are more often used, therefore, with moderate use, especially in fees, the toxic effect on the body is reduced to zero.

All patients with this pathology are observed in specialized offices, where there is a less active position in relation to herbal medicine, and sometimes even negative. The authors hope that this publication will be a reliable assistant and a practical guide for doctors, and among a wide range of readers it will strengthen the belief in the effectiveness of herbal medicine and will contribute to the health of people.

When composing phytotherapeutic programs, in the complex treatment of diabetes, it is always necessary to take into account the type of disease, clarify the presence of complications and focus more on the patient's attention on proper, balanced nutrition. When compiling a daily diet, it is necessary to take into account that 1 g of fat, as a result of reactions in the body, releases 9 kcal of thermal energy, 1 g of carbohydrates and proteins - 4 kcal each. The correct composition of the diet for this category of patients is 55-60 % carbohydrates, 20-25 % fats and 15-20 % proteins , while it is always necessary to take into account individual characteristics and physical activity. Phyto-dietology at all stages of care is indispensable in the treatment of this group of patients. Fats included in the diet should be predominantly of vegetable origin, this is a source of fat-soluble vitamins and polyunsaturated fatty acids. Such a diet will help protect the vascular wall, the normal synthesis of steroid hormones and the physiological content of cholesterol in the blood.

Proteins, calculated per 1 kg of weight, should not exceed 1 g (for pregnant women and adolescents - 1.5 g). They are necessary for the body to maintain anabolic processes, the active function of the immune, nervous systems and for normal life support. In diabetes, some of the proteins are consumed during glucogenesis, this also applies to essential amino acids. Our body receives these nutrients with meat, fish, but we must not forget that beans, soybeans, asparagus, peas (green peas), lentils, buckwheat (especially in milk soup) contain this protein-amino acid component. These plant foods are very affordable and should be included in the daily diet, and not just for people with diabetes.

Everyone knows that limiting readily absorbable glucose, the "simple" sugars that cause blood sugar spikes, is

the norm for people with diabetes. With diabetes, it is necessary to introduce more carbohydrates into the diet, containing fructose, inulin, complex sugars (starches), a large amount of fiber, this prevents a rapid rise in blood sugar. Fructose can replace glucose, it is absorbed by the cells of the body through an insulin-independent pathway, it is abundant in berries and fruits. Very useful, for patients of this group, fresh juices containing many micro- and macroelements (watermelon, pumpkin, apricot, blueberry, blackberry, pear, peach, etc.), in addition, they enhance diuresis, which helps to remove glucose from the body. It should be noted that the body of diabetic patients is in a state of constant acidosis, such well-known and affordable products as fresh cucumbers, pumpkin, zucchini, squash, eggplant (you can bake or stew some), alkalize the body very well, but they need to be used without salt … During the hydrolysis of inulin, which is contained in the roots of wheatgrass, dandelion, elecampane, chicory and other plants, fructose is formed, therefore, the use of these herbs in diabetes alone or in collections is always justified. The diet of carbohydrates can be expanded at the expense of products from durum wheat of coarse grinding, especially with the simultaneous use of gelatin, jelly, mucus, which contribute to a slower absorption of these sugars in the intestine.

The phytoseeds recommended by us (N. A. Ogrenich, 2012) for many years in the complex treatment of patients with diabetes usually contain 5-7 components. Reception of phyto-assemblies for this category of patients should be continuous, periodically changing the composition.

For patients of the 2nd type, the basic method is the collection “Exchange-diabetic”, composition: young spring shoots of blueberries, goat’s rue, dandelion (plant), bean pods. Preparation: Pour 450 ml of cold water over 2 tablespoons of the collection , leave for 4 hours and bring to a boil, leave for 40 minutes, strain, take 120 ml 3 times a day before meals , course 30-40 days. Another method of application is also possible: pour 2 teaspoons of the collection ground on a coffee grinder in a thermos with 350 ml of boiling water, leave for 3.5 hours, strain and take 100 ml before meals , in courses up

to 30 days. The biagudinin-containing plants (blueberries, beans) included in this collection protect insulin from destruction by peptidases, stimulate the synthesis of proteins and fats, and have a number of other regulatory actions on the body. Goat's rue herb normalizes glucose metabolism ("duplicates" the effect of insulin) and stimulates the regeneration of beta cells (islets of Langerhans). Dandelion, in addition to renoprotective, hepatoprotective and other active, normalizing effects on the body, contains inulin as a source of fructose, which is absorbed by the body without the participation of insulin. Five or six such courses are held per year, in intervals (3-4 courses per year), patients are advised to receive the collection "Hepatic-pancreatic" (traditional medicine "Pepan"), composition: agrimony, chicory, knotweed, nettle, yarrow, dill (5 %), sweet clover (up to 5 %). In the complex of phyto-programs, in autumn, winter and spring, in courses of 25-30 days, patients take tincture of Eleutherococcus, 25-30 drops 1 time a day, in the morning. At night, the patients took in the form of tea (without sugar), collection: "CVD (cardiovascular diseases)", composition: hawthorn, motherwort, meadowsweet, heartwood. This collection of herbs has a versatile effect (antihypoxic, sedative, angioprotective, improving the rheological properties of blood, stabilizing blood pressure, etc.). In the presence of hypertension, the phenomena of heart failure, the herb of jaundice was additionally introduced into this composition (up to 15 %). This composition of the collection was called "SZ (heart disease)", or "Cardifitis", as a means of traditional medicine, it is especially effective in older patients with a long course of the underlying disease.

When compiling a phyto-program for patients with type 1 diabetes who receive insulin, the state of all systems and the presence of complications are always taken into account. For patients of this group, the range of phytotherapeutic agents is significantly expanding, but there is no need to talk about the "standard scheme" of phytotherapeutic assistance in these cases. During the day, some patients can take 3-4 types of fees with different therapeutic focus; it all depends on the outgoing data and the existing concomitant pathologies. The main directions of phytotherapeutic correction in these cases is the

protection of peripheral vessels, prevention of hypoxia and acidosis, normalization of digestion and prevention of dysbacteriosis, elimination of vitamin deficiencies, micro- and macroelements (especially chromium and zinc).

During the day, and at night, all patients are recommended to collect “SZ” or “CVD” (the application is described above), alternating with another antihypoxic collection, which includes: linden, raspberry and birch leaves, violet grass, knotweed and canadian goldenrod … This fee is usually set in the morning and afternoon for 8-10 days each month. Reception of the collection “Exchange-diabetic” alternates with the reception of the collection “Hepatic-pancreatic” (application described above) and “Hepatic-restorative”, composition: agrimony, bedstraw, stinging nettle, St. John’s wort, sweet clover (up to 5 %). These fees are accepted consecutively for 10-12 days each morning and afternoon, and at night the collection is “CVD”, or “SZ”. All patients of this group can be recommended to take a decoction of marshmallow root in the morning (pour 1 tablespoon of marshmallow roots overnight with 150-200 ml of cold water, bring to a boil in the morning, but do not boil, leave for 10-15 minutes, strain and take once in 20 minutes before meals). Flax seeds can be used instead of marshmallow.

In spring, winter and autumn, simultaneously with taking antihypertensive charges (or collecting “CVD”), all patients were recommended short courses of taking adaptogens (more often Eleutherococcus), 12 days each (usually two courses in spring, autumn and winter).

There is no doubt that herbal medicine will take its rightful place in the complex treatment of diabetes and other chronic diseases, and practitioners will improve their knowledge, revealing the healing gifts of nature for the benefit of patients.

Conclusion

Diabetes mellitus is one of the most common diseases in the world. More often than diabetes mellitus, only cardiovascular and oncological pathologies are diagnosed annually. According to rough estimates, 3 % of the world's population suffers from diabetes mellitus today . The accumulated clinical experience has shown that neither the use of the best insulin preparations, nor the perfectly matched scheme and dose of insulin administration, can solve the problem of diabetes mellitus compensation without self-control of the disease at home. Some help in this difficult and long-term work can be provided by herbal remedies of the native flora. The plant world really has a wide range of remedies used in diabetes mellitus and related diseases. Moreover, unlike many medications, the use of which for health reasons, unfortunately, is associated with side, negative effects, herbal medicine uses little or generally non-toxic, mild agents. There is a possibility to choose a rational combination of herbal preparations that is most suitable for an individual patient. The long-term experience of the authors confirms this and gives some hope for a favorable course of the disease, a decrease in its manifestations and an improvement in the quality of life. This hope appears only when the patient CAM shows desire, patience, and persistence. As F. Voltaire said in the past: "Hope to recover is half of recovery."

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application

Phytopreparations and dietary supplements used in diabetes mellitus

Aviton vita diabetes is a specially developed amino acid-vitamin complex, which includes medicinal plants, vitamins, micro- and macroelements, amino acids, providing the most important intracellular processes in the body during the correction and therapy of type 2 diabetes mellitus (non-insulin dependent), in order to normalize carbohydrate exchange, improving the general condition and energy of the body.

It is recommended as an additional source of amino acids, vitamins, micro- and macroelements, antioxidants, as an

adjuvant in complex therapy for mild and moderate diabetes, as well as for:

• increasing the effectiveness of antidiabetic drugs and reducing their dosage;

• activates the synthesis of insulin and the regeneration of beta cells in the pancreas;

• normalization of protein and amino acid composition of blood;

• cleansing blood vessels and the body from excess glucose, salts, toxins;

• reduction of complications from the cardiovascular, nervous, musculoskeletal, urinary systems of the body.

Mode of application. Adults take 1 capsule 3 times a day before meals. Duration of admission - 30-40 days, repeat after 20 days.

Manufacturer: Apollux Company, specially for Kardea Group (Russia).

Agadiabet (tablets made from Amagadon cabbage leaves).

Alikor - contains garlic powder in tablets or capsules.

Action: anti-sclerotic, reduces cholesterol and triglycerides in plasma, lowers blood sugar.

Indications : diabetes mellitus, impotence, atherosclerosis, post-infarction period, prevention of heart attack and stroke.

Method of application : inside 1 tablet (capsule) 2 times a day.

Contraindications: hypersensitivity, gallstone disease.

Side effects: heartburn.

Release form : tablets of 300 mg; capsules of 150 mg in vials.

Amelline (Brussels sprouts extract).

Hypoglycine (a remedy from the fruit of the Blighia sapida tree in Jamaica, which can cause liver damage, accompanied by severe hypoglycemia).

DGKdiab (Russia)

Ingredients : chaga extract - 125 mg, dihydroquercetin - 60 mg, licorice - 15 mg, chicory - 50 mg.

Mechanism of action : anti-inflammatory, hypoglycemic, capillary-strengthening, anti-allergic.

Indications : diabetes mellitus type 1 and 2, as well as its complications.

Method of application : 1 capsule 1-2 times a day before meals for 1-2 months.

Release form : capsules of 250 mg.

Manufacturer : ANMO "NVS", Irkutsk.

"Diabetuline" is a dietary supplement of general strengthening and preventive action.

Ingredients: contains dry extract of birch bark, blueberries, roots and rhizomes of elecampane, lactose and calcium stearate.

Action : betulinol is a complex of triterpene compounds, anthocyanins, inulin, providing fortifying, anti-inflammatory, antioxidant, antihypoxic, hepatoprotective, hypoglycemic, immunomodulatory, adaptogenic and oncoprotective effects. Restores the function of the pancreas, eliminates inflammatory diseases of the gallbladder and biliary tract, stomach and small intestine.

Indications : increases the body's natural resistance, reduces complications of diabetic micro- and

macroangiopathy.

Method of application: 1 capsule (330 mg) 3 times a day before meals for a month.

Contraindications: individual intolerance to the components of the product. Not recommended for children under 12 years of age, pregnant and lactating mothers.

Side effects: not noted.

Release form : capsules of 0.33 g.

Manufacturer : firm “Birch World” (Moscow), tel. (495) 785-92-292.

Dihuang (China) (hydroalcoholic extract from 5 plants - ginseng root, Chinese wolfberry, medicinal dogwood, Di-Huang root, shiny asparagus).

Karinat is a preparation containing garlic powder, vitamins C, E, beta-carotene.

Action: hypocholesterolemic, antioxidant.

Indications: hyperlipidemia, increased blood clotting, acute thrombosis, hypertension, diabetes mellitus, immunodeficiency, impotence, pregnancy, hypoxia, skin diseases, intoxication, prevention of atherosclerosis, myocardial infarction, stroke, postoperative complications in patients with vascular lesions, acute, respiratory infections …

Method of application: inside, during meals, without chewing and drinking enough liquid, 1 tablet 2 times a day. The duration of admission is not limited.

Contraindications: hypersensitivity, gallstone disease.

Side effects: not identified.

Release form: tablets, capsules in vials of 30, 60, 100, 240 pieces.

Salyanka mound tea with blueberry shoots

Nutritional supplements for diabetes diet therapy: lowers glucose levels, improves liver biochemical parameters, removes aggressive cholesterol, normalizes liver function. Herbal tea is specially designed to correct carbohydrate and lipid metabolism. The powerful hepatoprotective effect of saltwort in combination with the well-known antidiabetic effect of blueberry shoots has made it possible to create a unique domestic product for diet therapy of diabetes. Clinical trials have shown a high insulin-like effect of tea. When taking it, the biochemical parameters of the blood (glucose, urea, cholesterol, etc.) are significantly improved, which indicates an improvement in liver function.

Active ingredients : chopped grass of the mound and blueberry shoots.

Release form: herbal tea.

Packaging: paper bags of 50 g, filter bags.

Certificate of state registration : number 77.99.23.3.U.285.1.06 from 16.01.2006 , the

“Obenyl ™” (obenyl)

A multicomponent phytocomplex of a balanced type of action for an effective solution to the problems associated with overweight and various forms of obesity.

First of all, its action is aimed at the most painless and comfortable elimination of chronic overeating syndrome through a gradual decrease in excessive appetite in general, as well as cravings for sweets and starchy foods in particular. At the same time, unlike most synthetic and hormonal drugs-anorexigens (appetite suppressants), “Obenil” does not inhibit digestion, and also does not cause unwanted side reactions of the body of a neurogenic nature or any disorders of the endocrine system. Since obesity, as a rule, is a metabolic disorder with which the body has become accustomed, the phytocomplex works smoothly and progressively, to the utmost excluding a sharp and negative stress effect.

Composition: extract of the famous plant pterocarpus marsupium (*Pterocarpus marsupium Roxb* .), Containing a rare component of the bioflavonoid class - L-epicatechin, which stimulates the insular apparatus and “revives” beta cells of the pancreas. This allows you to optimize the production of your own insulin and normalize carbohydrate and fat metabolism with their subsequent stabilization. Also increases the sensitivity of tissues to insulin and the utilization of glucose from the blood.

The action of other components causes a qualitative improvement in digestion and all functions of the gastrointestinal tract (GIT), a beneficial activation of the body’s excretory systems. Firstly, in “Obenil” there is a rare combination of safe plant “catalysts” for normal digestion and mild laxative and diuretic drugs that do not have sharp “avalanche” effects and, moreover, have a unique tonic effect. This allows, along with improving the peristalsis of the gastrointestinal tract, to gradually cleanse it of all kinds of toxins, eliminate stagnant processes and ensure the prevention of their recurrence.

Secondly, unlike many of its analogues, “Obenil” simultaneously stimulates each of the excretory systems, and not to the detriment of the rest. At the same time, activation of metabolic processes in tissues does not entail depletion of the body due to the action of special tonic and nourishing herbs.

“Obenil” is indicated equally to both men and women with overweight and obesity of various nature, including those aggravated by the development of type 2 diabetes and hypertension. In half the dose, it can also be given to children.

Method of application: for adults, 2 tablets 2-3 times a day after meals, always washed down with warm water (about half a glass).

The recommended course of application is 12 weeks.

Contraindications : pregnancy and individual intolerance to the components of the product.

For best results, it is recommended that you reduce your intake of foods that contain refined carbohydrates and

maintain an active lifestyle.

Packing : 50 tablets.

Expiration date : 3 years from the production date indicated on the label.

Manufactured by Charak Pharmaceuticals (I) HTP. Ltd. “, India.

Hank

Traditional medicine

Ingredients: leaves of peach, lemongrass, bacopa (brahmi), nettle, calamus roots, linden flowers, meadowsweet, saffron, marigolds, eyebright, astragalus, hawks, strawberries, snakeheads, sophora fruits and milk thistle meal.

Mechanism of action : health-improving effect (according to the literature) with a decrease in visual acuity.

Indications : as a source of flavonoids and polysaccharides with a decrease in visual acuity.

Contraindications : individual intolerance to the components.

Application form: 2 tablets 3 times a day 10 minutes before meals for 1-2 months in consultation with your doctor.

Release form : tablets of 0.5 g in vials of 50 pieces.

Storage conditions: in a dry place.

Shelf life is 2 years.

Manufacturer: LLC “V-MIN”, Sergiev Posad, 68 km of the Moscow highway, by order of LLC “Institute of Phytotherapy”, Moscow, tel. 8-499-129-56-64.

TU 9197-004-93458068-13.

PEAK

Natural inulin complex derived from Jerusalem artichoke.

Mechanism of action: the healing properties of Jerusalem artichoke are due

• high concentration of inulin in it;

• the presence in its composition of proteins similar in structure and immunological activity to thymus hormones;

• balanced macro and microelement composition;

• richness of vitamins of groups B and C;

• high content of organic polyoxyacids with a strong antioxidant effect.

Indications: for therapeutic and prophylactic purposes for diseases of the cardiovascular system, endocrine pathology, etc.

Method of application : for therapeutic purposes, adults and children over 12 years of age are advised to take PIK 1.5–2.0 g per day (3-4 tablets or 1/2 teaspoon of powder) in 1 or 2 doses 30 minutes before meals, with plenty of water for 20 days.

The optimal number of courses is 3, following each other with a 10-day break. In the future, depending on the condition, it is advisable to conduct repeated 20-day courses 3-4 times a year. If, when taking the entire daily dose (2 grams or 1/2 teaspoon) in 1 dose, there is an increased feeling of hunger, indicating a decrease in blood sugar levels, it is necessary to divide this dose into 2 doses. In the case when this measure does not eliminate the feeling of hunger, it is recommended to reduce the daily consumption of PIK to 1.5 g (3 tablets or one coffee spoon without a slide of powder).

As a prophylaxis of exacerbations of chronic diseases in order to prevent the consequences of the influence of negative environmental factors of the environment, adults and children over 12 years old are recommended to take PIK in a dose of 1-2 g for 20 days; 3-4 courses per year.

For children under 12 years of age, PIK is prescribed in a daily dose of 20 mg per 1 kg of body weight; the duration and frequency of treatment and prophylactic courses are the same as in adults.

Contraindications : PIK should be taken with caution in people with reduced blood clotting and a tendency to bleeding. In this case, the dose of the product should be reduced by 1.5-2 times, the duration of the course remains the same, but the number of consecutive courses, depending on the state of health, should be no more than two.

Collection "Arfazetin "

Composition: includes bean flaps, rhizomes of aralia, zamanihi, rose hips, horsetail herb, St. John's wort and chamomile flowers.

Actions: hypoglycemic; increases tolerance to carbohydrates, enhances the glycogen-forming function of the liver.

Indications : type 2 diabetes mellitus.

Method of application: inside in the form of infusion, 1/3 cup 3 times a day for 25-30 days.

Contraindications: hypersensitivity.

Side effects: not noted.

Release form: briquettes, filter bags and as a collection of 50-100 g.

Collection "Mirfazin "

Ingredients: includes blueberry shoots, bean shells, blueberry fruits, nettle leaves, plantain, chamomile flowers, calendula, St. John's wort, yarrow, motherwort, licorice roots, elecampane.

Actions : hypoglycemic, hypolipidemic.

Indications : mild forms of diabetes mellitus, lipid metabolism disorders.

Method of application: inside in the form of infusion 3 times a day for 4-6 weeks.

Contraindications : hypersensitivity.

Side effects : not noted.

Release form : in packs of 75 g.

Sucontral

Liquid extract of the South American plant Omen.

Phaseolamine

An agent that helps to normalize metabolism and weight. Product Components: Proprietary Bean Extract (Phaseolus vulgaris) Phaseolamine-2250 is the newest natural weight loss product. According to clinical studies, this extract blocks the absorption of starch and the conversion of carbohydrates into sugar, reduces body fat while maintaining muscle mass, lowers blood glucose and cholesterol levels, reduces appetite and increases performance. Phaseolamine is the main active ingredient in Golden Slim tablets. Like all our weight loss products, Golden Slim tablets contain a vitamin and mineral formula. This is necessary to replenish the insufficient intake of substances necessary for the body while following a diet. Vitamin E is an antioxidant and regulates metabolism, reduces the risk of cardiovascular diseases and premature aging. Vitamin B6 (pyridoxine) regulates metabolism and is the most used vitamin in weight loss programs today. As a result of the use of Golden Slim products, appetite decreases, digestion improves, subcutaneous fat is utilized and disappears, metabolism is normalized.

Dramatic weight loss should be avoided as it can damage health.

Method of application : it is recommended to take two or three tablets of Golden Slim daily (depending on body weight) before meals (taking all herbal preparations is effective only when taken 30-40 minutes before meals). Drink the tablets with plenty of water. Products of the Golden Slim series (weight loss pills and diet cocktail) are used in combination to increase the effect of weight loss. Recommendations for taking in combination with the Golden Slim cocktail: the cocktail

replaces 1-2 meals. The third meal is accompanied by the intake of two Golden Slim tablets (30 minutes before the meal). The recommended course duration is 1 month.

Composition for 1 tablet: Phaseolamine-2250 375 mg, legume fiber 50 mg, cellulose (fiber) 127.5 mg, vitamin E (alpha-tocopherol) 2.5 mg, vitamin B6 (pyridoxine hydrochloride) 0.5 mg.

Manufacturer : Natur Produkt.

Hawk - capsules for vision

Ingredients : blueberries - 50 %, cranberries - 25 %, carrot juice concentrate - 25 %.

Indications: a drug to improve vision. A source of anthocyanins and carotenoids, from which eye cells produce light-sensitive elements. Lack of anthocyanins leads to irreversible changes in the choroid and retina of the eyes, stretching of the eyeball, rupture of the retina and its detachment, opacity of the vitreous body, myopia and hyperopia, promotes the development of glaucoma and cataracts. Children and adults who work with computers for a long time are especially affected. An important distinction of Yastrebinka is its balanced composition.

Application: 1 capsule 1-2 times daily before meals. Persons working on a computer or working with intensive eyes - 2-3 times a day. It is recommended to take the drug within 60 days.

There are no *contraindications* .

Manufacturer - “FitoGoR” LLC, Belarus.

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