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MEDICINAL PLANTS WITH CARDIAC GLYCOSIDES (CARDENOLIDES AND BUFADIENOLIDES) IN THEIR COMPOSITION AND THE IMPORTANCE OF THEIR USE

Annotation. The article deals o'ith the effective use of the heritage of medicinal plants, identifying the beneficial properties of medicinal plants and recommending their production.
Keywords: Pharmaceutics, medicinal plants, folk medicine, human health, less complicated.
Аннотация: В статье речь идет об эффективном использовании наследия лекарственных растений, выявлении полезных свойств лекарственных растений и рекомендации по их производству.
Ключевые слова: Фармацевтика, лекарственные растения, народная медицина, здоровье человека, меньше осложнений.
Annotatsiya. Maqolada dorivor o'simliklar bo'yicha qoldirilgan meroslardan unumli foydalanish, dorivor o'simliklarning foydali xususiyatlarini aniqlash va ularni ishlab chiqarishga tavsiya qilish bo'yicha ma'lumotlar keltirilgan.
Kalit so'zlar: Formacevtika, dorivor o'simliklar, xalq tabobati, inson salomatligi, kam asoratli.

As we live in a time when today's formaceutical industry is booming, we hear little about medicinal plants. But in many countries that have developed, at the same time, they are promoting the use of medicinal plants instead of drugs synthesized chemically. The main reason for this is useful in the fact that medicinal plants do not leave complications after themselves, while strengthening human health.

In Central Asia, a kind of Oriental folk medicine has been formed for centuries, it has been using healing plants for thousands of years

based on experience. The main weapon of folk medicine was considered medicinal products prepared on the basis of medicinal plants and their raw materials [6,7,8].

It is known that plants used to treat diseases found in humans and animals, as well as to prevent these diseases, are medicinal plants. As early as bc, there was information about healing plants in humans and the methods of treating many diseases with them, and they were used in practice. In 1956, the ancient records of BC, which were managed to read by German scientists, also contained information about the methods of making medicinal ointments from medicinal plants. In the Assurbanipal library of the ancient Syrian Horn (668 BC), 22,000 tables inscribed in cuneiform on ceramic tablets were found, 33 of which contain information about medicinal plants and products made on their basis [1, 2, 3].

According to X.X. Kholmatov and U.A. Akhmedov [1, 3], during the time of the ancient Greek judge Hippocrates (460-377 BC), about 236 medicinal plants were used, written information about this has reached us in his work "Corpus Hippokraticum". Hippocrates left the words that a healer has 3 weapons - his word, plant and thorn.

The Zoroastrian book "Avesta" contains about 1000 medicinal plants and information about their effects on the human body. The world-renowned scientists of Central Asia - Abu Raikhan Muhammad ibn Ahmad al-Biruni (973-1048) and Abu Ali ibn Sina (Avicenna) (980-1037) contributed to the field of medicinal plants. These scientists laid the foundation for the modern sciences of pharmacognosy and pharmacology. Abu Raykhan Beruni's scientific work on pharmacognosy called "Saidona" (1041-1048) contains information about 750 types of medicinal plants [4].

S.I. According to Ishakov [5], Abu Ali ibn Sina became known to the world because of his famous scientific work "Al-Qanun" ("Laws of Medicine") dedicated to medicine. The 5-volume work "Al-Qanun" ("Laws of Medicine"), created by the scientist based on the experiences he has spent in medical practice for 20 years, served not only Arab, but also European doctors as a guide for centuries. The book contains information about more than 500 medicinal plants and more than 40 medicinal products prepared from them.

Aglycones of cardiac glycosides - genins combine with one, two, three and sometimes four sugar molecules to form glycosides. These glycosides are called cardiac glycosides (or heart poisons) because they mainly affect the heart muscle.

Cardiac glycosides must contain one of two compounds in the genins:

If the heart glycoside molecule contains a 5-membered unsaturated lactone (butenolide) ring, it is called cardenolides (I), if it contains a 6-membered 2-fold unsaturated lactone (coumalin) ring, it is called bufadienolides (II).

In addition to cardiac glycosides, steroid compounds include substances commonly found in plants and animals: vitamin D, some saponins, sterols (phyto- and zoosterols), uric acid, hormones of sexual organs and other compounds. Although the main skeleton of these compounds consists of a cyclopentanephenanthrene nucleus, they differ greatly in their chemical structure. But the groups characteristic of cardiac glycosides are: ON on carbon atoms located at number 3 and 14, SN3 at carbon atom located at number 13, and 5 or 6-membered unsaturated lactone rings combined with carbon atom at number 17. Carbon atoms numbered 5, 11, 12 and 16 have additional ON, and carbon atom number 10 has methyl-CH3 (angishvonagul type) or strophanthus type groups.

Sugar in the glycoside molecule is connected to the 3rd carbon atom of the sugar skeleton through the OH group. One glycoside can contain up to 5 monosaccharides.

Most often, glucose is the sugar part of the glycoside molecule, as well as specific 6-deoxyhexoses (no ON group on the 6th carbon atom), 2-6-deoxyhexoses (no ON group on the 2nd and 6th carbon atoms) and the 3rd carbon of these deoxyhexoses. It contains methyl ethers and specific di- and trisaccharides formed by the atom. Currently, 35 different monosaccharides are known that are part of cardiac glycosides.

The main active group of cardiac glycosides is a 5- or 6-membered unsaturated lactone ring located on the 17th carbon atom. Although 5 or 6 members of this group is not very important for the action of glycosides, but cleavage or saturation of the lactone ring (for example, in strophanthidin) completely stops their action. Therefore, during preparation, drying and storage of the product, it is necessary not to forget the conditions mentioned above. Because if the prepared plant is kept in a humid place and not dried in time, the cardiac glycosides contained in the product can be hydrolyzed, the lactone ring of genin can be saturated, oxidized and decomposed. As a result, the effectiveness of glycosides is reduced or completely lost.

During product preparation and drying, cardiac glycosides with complex molecules can be broken down and release one or two or all sugars. Therefore, scientists believe that plant tissue contains primary, more complex molecules, that is, genuine glycosides. According to them, dried products and medicines prepared from them (as well as isolated crystalline glycosides) contain secondary glycosides or genins, formed by the hydrolysis of the primary glycoside, which dissolve one or two sugar molecules. This idea may be based on the fact that cardiac glycosides present in certain conditions (during drying, storage or extraction of glycosides) are actually easily hydrolyzed. However, some experiments conducted on plants have shown that cardiac glycosides are not always broken down in the above-mentioned processes, but sometimes they can be complexed. For example, the doctor of chemical sciences Prof. N. K. Abubakirov proved that when the root of the hemp plant (Apocynum cannabinum L., Apocynum androsaemifolium L.) is dried for a long time in the open air, its content of K-strophanthin - p-glycoside, rich in sugar molecules, is decomposed (mainly alive monozide cymarin accumulates in plant tissue). Based on this experience, N. K. Abubakirov came to the opinion that it is not appropriate to divide cardiac glycosides into primary genuine and secondary groups. Sungra proved that plant glycosides can constantly change (from a simple form to a complex form and, conversely, to simplify from a complex form).

The experiments described above also confirm the participation of cardiac glycosides in the process of biosynthesis in plant tissue. It is known that as the plants dry, the humidity in their growth decreases. This leads to a violation of the process of biosynthesis in the tissue. Perhaps, in this period, a complex glycoside molecule should be synthesized in the presence of sugar in order to separate the water molecule necessary for the tissue.

Erysimum canescens Roth, VILR researcher E. I. Ermakov found that the amount of cardiac glycosides increases due to hydrolysis with the participation of enzymes in the seeds of the plant Erysimum canescens Roth. When the crushed and moistened seeds were burned for 24 hours at a temperature of 22-25°, the amount of glycosides in them increased by 10%. According to A. I. Ermakov, this phenomenon is partially due to the presence of cardiac glycosides in complex compounds and their separation in pure form as a result of hydrolysis and their extraction from the plant.

The heart is mainly affected by genins of glycosides. Sugar increases their solubility in water and helps them accumulate in the heart muscle. In addition, the sugar part accelerates and prolongs the absorption of glycosides in the body. At the same time, some sugar molecules can combine with genin and change its effectiveness. For example, rhamnose greatly increases the effectiveness of Karaganda genin (as part of lily-of-the-valley toxin) on other candies, and when combined with tevitose candi genii (as part of tevetin), it reduces the effectiveness of the glycoside molecule.

Usually, cardiac glycosides have a stronger effect on the heart than their aglycones - genins. It should be said that sometimes the opposite effect can be found. For example, the aglycon of glycoside E of lanatoside has a 9 times stronger effect on the heart than the glycoside of gitaloxigenin. In bufadienolides, aglycones are close to sugar glycosides in terms of their biological activity.

The activity of cardiac glycosides is also affected by their external and internal isomers. If the lactone of the 17th carbon atom is attached to the molecule in the p-position, the glycoside is more biologically active, and if it is attached in the a- position, it is very weak.

Pure cardiac glycosides isolated from the plant are bitter and tasty crystalline compounds, well soluble in water and alcohol, poorly soluble or completely insoluble in other organic solvents.

Cardiac glycosides are synthesized in plant tissues and, like other glycosides, they are found dissolved in the cell sap of all plant organs. Glycosides that belong to this group are hemp plants (Arosupaceae), cowtail plants (Scrophulariaceae), tulip plants (Liliaceae), bear plants (Ranunculaceae), asclepiadaceae (Asclepiadaceae), celery plants (cruciferae) - Apiaceae (Cruciferae), legumes (Fabaceae), juka plants (Tiliaceae). , moraceae (Moraceae), celastraceae and other family members were found.

So far, about 400 cardiac glycosides have been isolated from plants worldwide. 160 of them were obtained and studied in the former Union. 380 of the isolated glycosides belong to cardenolides, and the rest belong to bufadienolides.

136 aglycones and 35 monosaccharides are involved in the formation of known cardiac glycosides.

Therefore, even now, we should make good use of the legacy of medicinal plants, determine their useful properties and recommend their production. People should not forget that when medicinal plants are used, they have a slower effect than drugs synthesized by chemical means. However, the complications are almost invisible. That is why we need to further develop this area.

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