

Ethnobotany and traditional medicine in the Pamir

Этноботаника и традиционная медицина на Памире

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Summary. The article describes diversity of medicinal plants of the Pamir and their use in traditional medicine for the treatment of bone diseases – rheumatoid arthritis, arthrosis, radiculitis, bone fracture and others. Mainly, degenerative processes, cartilage tissue destruction or inflammation lead to these health issues. The research shows that more than 20 medicinal plants of the Pamir are widely used in ethno medicine as therapeutic agents for the above mentioned problems. Such plants like *Chenopodium rubrum*, *Berberis iliensis*, *Equisetum arvense*, *Nepeta glutinosa*, *Artemisia sieversianus* etc, some of which widely distributed in the Pamir, contain bioactive components that helpful for bone diseases. The ethnobotanical studies helped us to show the value of these plants in traditional medicine of the Pamir. Based on the results, we recommend the plants for the further pharmacognostic and pharmacologic research as source of therapeutic agents and identification their potential for future use in medicine.

Key words. Bone diseases, ethnobotany, medicinal plants, the Pamir.

Реферат. В статье описывается многообразие лекарственных растений Памира, которые используются в народной медицине местным населением для лечения заболеваний костей – ревматоидного артрита, артрозов, радикулитов, остеохондроза и других заболеваний опорно-двигательного аппарата. В основном к этим проблемам со здоровьем приводят дегенеративные процессы, разрушение или воспаление хрящевой ткани. Исследования показывают, что более 20 лекарственных растений Памира широко используются в этномедицине в качестве лечебных средств при указанных проблемах. Такие растения, как *Chenopodium rubrum*, *Berberis iliensis*, *Equisetum arvense*, *Nepeta glutinosa*, *Artemisia sieversianus* и т. д., некоторые из которых широко распространены на Памире, содержат биологически активные вещества, полезные при заболеваниях костей. Этноботанические исследования помогли нам показать значение этих растений в народной медицине Памира. На основании полученных результатов мы рекомендуем эти растения для дальнейших фармакогностических и фармакологических исследований в качестве источников лекарств и определения их потенциала для дальнейшего использования в медицине.

Ключевые слова. Заболевания костей, лекарственные растения, этноботаника.

Introduction. Diversity of medicinal plants of the Pamir help people to use them in traditional medicine and solve such health problems like rheumatoid arthritis, arthrosis, osteoporosis or bone fracture. Many perspective species of the genera *Salix*, *Comarum*, *Horsetail*, *Nepeta* use for the treatment of bone diseases (Sandhu et al., 2010; Upadhyay, 2016) are also distributed in the Pamir. The plants are rich in minerals, vitamins and other bioactive components, which help to restore bone and cartilage tissues. As we know, the problems of bone diseases mainly accelerate when people age, the time when many functional systems of the organism marginally start to decline (Grzibovskis et al., 2010). And the organism becomes sensitive even to simple inflammation and microbial activities, which then causes big health problems. Malabsorption of mineral which leads to porosity, weakening and degeneration of bone tissue, due to which they become prone to fracture, is another cause of bone diseases. Therefore, use of natural remedies as well as traditional medicine should find therapeutic agent to solve the problems.

Materials and methods. Ethnobotanical methods (Martin, 1995; Cotton, 1996) were used to identify the diversity of medicinal plants of the Pamir that local people use in traditional medicine for bone diseases.

More than 450 local people of the Pamir were surveyed on which plants and how they use them for bone diseases.

Results. The research has shown that more than 20 species of medicinal plants of the Pamir are used in ethno medicine for the treatment of muscular-skeletal system disease. These are *Chenopodium rubrum* L., *Artemisia sieversianus* Ehrh. ex Wild., *Nepeta glutinosa* Benth., *Berberis iliensis* M. Pop., *Rhodiola pamiroalaica* Boriss., *Comarum salesovianum* Aschers et Graebn, *Equisetum arvense* L. and others. Most plants have anti-inflammatory and anesthetic effects and, thus, are used for the treatment of rheumatic arthritis and arthroses. Survey has shown that such plants like willow, which contains silicic acid, is widely used for joint-related diseases. *Artemisia sieversianus* has anti-inflammatory effect and helps to treat arthritis. The aerial part of the *Equisetum arvense* is rich in microelements and helps to restore bone tissues.

Some medicinal plants are used for the treatment of the fractioned or broken bones. The aerial parts of *Nepeta glutinosa*, *Delphinium oreophyllum* and the roots of the *Berberis* species are used most commonly for sealing the broken fractures of the bone. *N. glutinosa* has been used from the distant past by the local people of the Pamir for the treatment of bone and joint diseases. It is very good therapy for such diseases like rheumatoid conditions, joint distortion, back pain and even for the treatment of bone fractioning. Mainly, these diseases are caused by inflammation, microbial effect, swelling or injury. For the treatment purposes mostly the aerial part – stem and leaves are used. However, local people use the plant buds, especially, located at the bottom of the steam.

Our ethnobotanical studies have shown that in folk medicine of the Pamirs different types of preparations were produced from the leaves and steams of the plant. The research has shown that difference was observed between the types of preparations and their linear progression effects on the reducing the inflammatory diseases of bones and cartilages, known as rheumatism conditions (Figure 1).

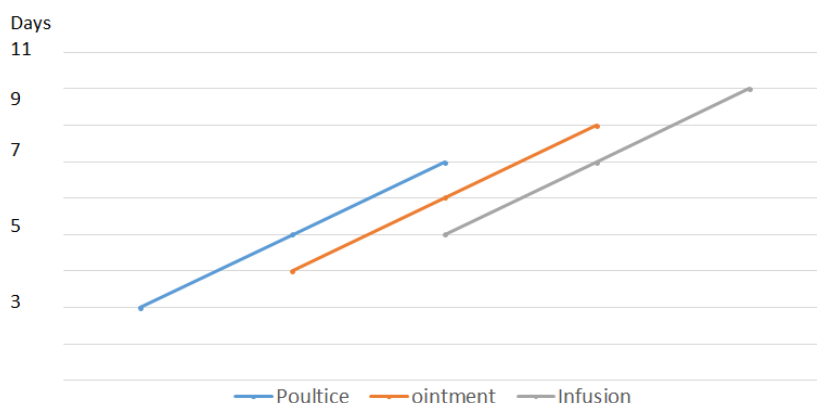


Fig. 1. Different types of drugs prepared from *Nepeta glutinosa* and their effects on rheumatism condition.

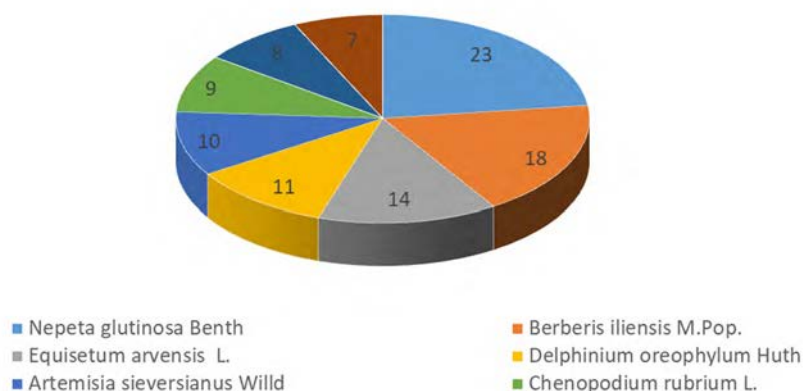


Fig. 2. Perspective medicinal plants of the Pamir that has therapeutic agents and use for the treatments of musculoskeletal system diseases.

The plants can be used separately as well as in combination with each other and or with the other sources of drugs like Mumiyo, which has rich mineral content. Together with Mumiyo *N. glutinosa* helps to restore the tissues of the broken bone or cartilages. The research has shown that more than 23 % of the people of the Pamirs use *N. glutinosa* for the treatment of fractioned bones alone or in mixture with the Mumiyo or the roots of *Berberis*. *Berberis* also is rich in minerals and other bioactive components and can be beneficial for the bones treatment. *N. glutinosa* is also applicable in the treatment of animals' bones. The results of ethnobotanical survey show that nor such big doses of the plant which is used for the treatment of radiculitis or arthrosis negatively affects the organism. It brings to the hardening or cementing of the bones, which is harmful, especially for pregnant women and causes problems for the delivery processes. The results of ethnobotanical surveys are shown in the figure 2.

The results have shown that most common plants of the Pamirs that are used for the treatments of bone diseases are: *Nepeta glutinosa* (23 %), *Berberis* species (18 %), *Equisetum arvense* (14 %) and *Delphinium oreophyllum* (11 %). As the survey has shown the percentage of the other plants in the treatment of bone diseases in the Pamir ethnomedicine is less than 10 %. The research has also shown that the above mentioned plants are mainly used in traditional medicine. However, they need further studying and can be implemented for drug design.

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