

Traditions of Folk Medicine in Georgia and Perspectives of Using Natural Medicinal Plants

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Abstract: The treatment methods and knowledge accumulated in Georgia over the centuries are related to the country's geographical location, diverse nature, traditions, history and knowledge of the use of medicinal products.

The article discusses a brief history of the development of folk medicine in Georgia, the medicinal plants that have been used in traditional medicine for centuries, the biological and landscape diversity of the country, the geographical features of the distribution of some medicinal plants and their main medicinal purpose, the economic importance of medicinal plants and the problems associated with their extraction.

Keywords: Georgia, Folk Medicine, Diversity, medical plants, geography.

INTRODUCTION

The traditions of folk medicine in Georgia are thousands of years old. The treatment methods and knowledge accumulated by the population of Georgia over the centuries are related to the country's geographical location, diverse nature, traditions of using medicinal products, history and knowledge. Such knowledge was transmitted through special books, family traditions, legends, or by word. It is established that the knowledge about healing properties of plants in Georgia was widely recognized in the world at that time several thousand years ago.

In these days, many families related to folk medicine are known in Georgia. From ancient times, they have the knowledge to use medicinal plants and mineral waters. Medicinal plants were used for wound healing, cesarean section, trepanation, and blood transfusion, making anti-venom, etc.

It is known that the use of chemical medicines is often carried out for a long time, which is followed by a decrease in its effectiveness and an increase in drug dependence. It is also known that the use of chemical medications has side effects, which further worsens the results of the treatment, and in the worst case, contributes to the development of a new disease.

Because of this, in the modern world, the consumption of natural remedies for the prevention of many diseases is constantly increasing.

METHODS







While working on the article, were used the existing scientific literature on medicinal plants of Georgia and the method of comparative analysis of historical sources (Karabadini, 2017, Vakhushiti Bagrationi, 1997). A certain role was played by cartographic, geographical, and field research methods, through which the biological and landscape diversity of Georgia was discussed. The analysis of historical sources was of particular importance for the analysis of the development of folk medicine (Akhalkatsi, act. 2008). It allows us to fully assess the stages of development, potential and perspectives of folk medicine in Georgia.

RESULTS

1. Traditions of Folk Medicine in Georgia

Georgian medicine of ancient times left an incredible mark in the history of world medicine. It is worth noting that the word medicine is related to the daughter of the legendary king of Kolchheti (West Georgia) Ayet, with the name of Medea (approx. XIV-XIII century BC). She is considered a famous healer of the era. Medea's garden of medicinal plants and the effectiveness of the use of such plants were known throughout the ancient world. She had unique experience in medicine, in many directions of pharmacology and cosmetics, which Herodotus, Xenophon, Aristotle, Hekate of Miletus, Scylaxes and other outstanding scientist or historian of antiquity knew well. It should be noted that the medicine of Kurt Joachim Sprengel (1766-1833), a prominent German doctor, botanist, medical historian the five-volume Pragmatic History begins with the history of Kolchic medicine.

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Photo of the plant	Name of the plants, characteristics, distribution
	<p>Mint (<i>Mentha</i>) - is a perennial herbaceous plant, 4 species grow wild in Georgia: pennyroyal, field mint, water mint (<i>Mentha aquatica</i>), forest mint (<i>Mentha longifolia</i>). It grows in moist meadows in the lower and middle altitude of the mountain, forest edges, thickets, river bottomlands and other places. Mint reproduces vegetatively. Mint leaves and flowers contain essential oil (1.5 - 3.5% dry weight), the main component of which is menthol. Tincture made from leaves is used in medicine as a spasmolytic and pain reliever.</p>
	<p>Valerian - A perennial herb. 10 species grow in Georgia (2 of them are endemic to the Caucasus). <i>Valeriana officinalis</i> is the most widespread species. It grows up to 1.5 m, it is found in forest edges and thickets. <i>Valeriana colchicum</i> also grows in Georgia, which also contains a large amount of essential oil and valerian acid. Valerian preparations (extract, tincture on alcohol and ether) are used for nervous excitement, insomnia, neurosis of the cardiovascular system and others.</p>
	<p>Vetches - Perennial herbaceous plant, widespread everywhere in Georgia.</p> <p>A decoction of the herb strengthens the flow of bile, has astringent properties, is used in the case of dysentery, as well as gastritis.</p> <p>In the treatment of stomach ulcers. Reduces fluid loss in the human body. In folk medicine, a tincture of this plant leaves is used as an antiperspirant, and the roots are used to treat hemorrhoids and bloody diarrhea.</p>
	<p>Psilotopsida - A 20-30 cm long twig fern, with two or three-fold finger-like, tender, short-summit leaves. Contains tannins, bitterness, sugar, and a little essential oil. In ancient times, it was used against coughs.</p>
	<p>Nightshade - Perennial, rarely annual herbs, semi-shrubs or shrubs, sometimes trees. Correct, about 1700 species are known in the world, 11 of them are found in Georgia, in medium-sized pine forests. Herbs and fruits are used for treatment. The fruit is characterized by analgesic, diuretic, antipyretic, expectorant, antirheumatic properties. Calms the nervous system, improves vision.</p> <p>Nightshade preparations are used in folk medicine for the treatment of abdominal pain, bladder, urolithiasis and gallstone diseases, atherosclerosis, rheumatic diseases, ulcers, and purulent diseases.</p>
	<p>Cyclamen - Common in the forests of Georgia. In dry form, it is used in liver and gynecological diseases, against neuralgia, frontitis and hemorrhoids.</p>
	<p>Lavender - Grasses, forbs and shrubs. More than 25 species are known, mainly distributed in the Mediterranean.</p> <p>Its oil is mainly used for baths. A decoction of flowers is a sedative, soothes pains, regulates acidity. Its oil is used for rheumatism, flu, strong heartbeat, irritability, etc. for treatment.</p>




	<p>Crocus - Perennial herbaceous plant, 5 species of it are known in Georgia. It is mainly found in high mountains, in the alpine zone. It is used to make various medicinal preparations - tinctures, extracts, eye drops. It cleans the blood, regulates the menstrual cycle. Used to treat colds, coughs, asthma; Helps with diarrhea, anemia; Treat infertility, increase potency. It has a positive effect on the liver, nervous and cardiovascular diseases, rheumatism and regulates metabolism.</p>
	<p>Elder - A tall (3-6 m) branched shrub or low tree.</p> <p>It grows almost everywhere in Georgia - in forests, forest edges and ravines, mainly on moist slopes. Its flower, after drying, is used as an antiperspirant for colds, chronic bronchitis, bronchiectasis, flu and angina. Its preparations are also used for some liver diseases, and as a diuretic - for kidney diseases.</p> <p>For the treatment of burns, wounds and sprains, neuralgia and joint pain.</p>
	<p>Elderberry - Perennial herbaceous plant, found throughout Georgia. Used for treatment: root, fruit, flower, leaf, twig. It has a good diuretic, diaphoretic, antidiabetic, antiseptic and expectorant effect. It is also used to treat respiratory tract catarrh, neuralgia, rheumatism, urticaria and other diseases.</p>

Figure 1: Some medicinal plants of Medea's garden and their characteristics.

Information about the active use of medicinal plants in Georgia can be found in the "Argonautics" of Apollonius of Rhodes, who worked in ancient times. In Kolkheti, the famous Hekate's garden was located, where more than forty plants were grown. For example, Chervil, Venus's hair (fern), Dogwood, Papyrus, Lavender, Mint, Saffron, Poppy, Valerian and others. Ancient medicinal plants, which are still widely used in medicine today, are: Valerian, Dog-rose, Coltsfoot, Plantago, Chelidonium, Barambo and many others. (Tsutsunava, 1966).

Almost all foreign writers, historians and geographers of the age had information about healing and medicine making in Georgia. Certain rules of collection, production and consumption of a number of precious medicinal plants, which were known in Georgia, caused great interest in neighboring countries. The same is evidenced by the reports of Roman, Byzantine, French, German, Persian, English and other travelers, missionaries and scientists. Information about the importance and geography of medicinal plants in the beginning of the 18th century is given by Vakhushiti Bagrationi in the book "Description of the Kingdom of Georgia" (1997). It was based on medical books in Georgia in the Middle Ages, which

contain references to the medicinal value and use of many wild and cultivated plants.

The medieval healing book was called Karabadini (Karabadini. 2017). It was of three types according to its content and purpose: medical (for doctors), family (for the population) and short (reference profile).

Karabadini, composed by different authors and in different periods (11th, 12th, 15th and 19th centuries), has been studied and published in Georgia. In addition to Georgian, Greek, Roman, Arabic, Persian and other people's medical knowledge, analysis and treatment methods are described. They discuss methods related to the detection and treatment of diseases, the properties of food products and medicinal products, almost all directions of medicine available at that time, the experience of using natural factors for treatment is described (Shengelia, 2012).

Medicinal plants are found and consumed in all regions of Georgia. This is due to the knowledge, experience and recipes left by our ancestors. However, most of the population believes that folk medicine is quite effective and safe. The study and cultivation of medicinal plants, the development of this branch of agriculture, due to the natural diversity of Georgia, can

become an important prerequisite for the country's economic development.

2. BIOLOGICAL AND LANDSCAPE DIVERSITY OF GEORGIA

Georgia is world-famous for its biological and landscape diversity. With a unique history of the use of medicinal plants, traditions of folk treatment have survived to this day. Georgian alpine and subalpine landscapes, poly dominant and Kolkhic forests are especially rich in medicinal plants. Their formation and medical-geographical potential is related to a number of characteristics of the natural environment, the most important of which are: geographical location, vertical natural zoning, features of the landscape's altitudinal distribution (from sea level to 5200 meters), several types of climate (humid, semi-humid, semi-arid, arid), several dozen types of soils, etc.

Evaluation of medical-geographical potential of natural environment elements includes several interrelated stages. These are: determination of the evaluation object (natural component), determination of evaluation criteria and parameters. In this regard, it is possible to use a five-level scale - very favorable, favorable, moderately favorable, less favorable and unfavorable.

Several types of assessment of the natural environment are known: medical-biological (related to human ecology) and aesthetic (related to human psychology).

Medical and biological types reflect the impact of environmental factors on the human body and its capabilities. The main ones here are climatic (including types of weather in a given period, air temperature dynamics, air humidity, wind speed, solar radiation, amount of precipitation, dryness index, etc.), hydrological (capacity and duration of snow cover, surface runoff, flood or flood indicators) and topographical (elevation, exposure, etc.) factors (Elizbarashvili, act., 2018, 2021, 2022).

From the medical-geographic assessment of environmental elements special attention is paid to terrain, vegetation, humidity level and climate. From the assessment of the relief, special importance is given to the division of the territory, relative height, relief forms (glacial, karst, volcanic, peak, nival) and others. A large variation in relative heights creates effective landscapes, which is important for aesthetic diversity.

From the assessment of vegetation, special importance is given to its species composition,

stratification, age, etc. It is known that mixed, poly dominant and multi-tiered forests stand out from the medical-geographic point of view, several types of vegetation or evergreen elements also participate in the formation.

Georgia is also distinguished in the world by its high share of virgin natural environment (territories), which is represented on 15% of the country's area. 2/5 of the territory of Georgia is covered with forests, which is a great resource. Here can be found more than 15 thousand species of plants, including more than 4 thousand seed plants, 75 ferns and 2600 algae. 6.0% of vegetation, or about 900 species, are endemic and relict. Georgia according to the number of species of the living world, endemism and biodiversity is included in the top five European countries, which clearly indicates the diversity and uniqueness of its natural environment (Biological and., 2000, Elizbarashvili, at all. 2021).

Georgia ranks 12th in the world in terms of landscapes, and first in Europe. With this indicator, it is behind only such large countries as China, USA, Russia, Australia, Mexico, India, Canada, Brazil, Argentina, Turkey and Chile. If we connect the number of landscapes with the area of the territory, then according to landscape diversity, Georgia will be on the first place in the world.







Georgia does not stand out in Europe either by its geometrical parameters or by its socio-economic potential. However, despite its small area, all types of European landscape units and all forms of vertical distribution of the living world can be found in our country.

The number of species of flora in Georgia exceeds such countries as the United Kingdom, Ireland, Bulgaria, Romania, etc. We are in first place in Europe in terms of the number of species of mammals and birds, the specific share of intact forests and the degree of active anthropogenic impact on the environment.

Georgia also has very high indicators of agro-diversity. More than 500 grape varieties have been bred in Georgia, 14 of the 29 wheat species known on earth have been described in Georgia, among which 5 are endemic (biological., 2000, Elizbarashvili, at all. 2021).

3. MEDICINAL PLANTS OF GEORGIA AND THEIR DIVERSITY

Medicinal plants can be divided into two groups: medicinal plants used in folk medicine (ethnomedicine)

Photo of the plant	Name of the Plants, Characteristics, Distribution
	<p>Lilies of the Valley - A herbaceous plant, found in Georgia up to the middle mountain belt, in forests and bushes. The flower and leaf contain glycosides—mainly convallotoxin and convallaria—which are used to treat heart disease. Essential oil distilled from flowers is also used in medicine. It is also used to treat cardiovascular diseases.</p>
	<p>Tussilago - In Georgia, it grows on the banks of the river, on bare and wet slopes, on moist clay soil. It is used to treat diseases of the respiratory organs.</p>
	<p>Berberis - Shrubs, rarely small trees (height up to 3.5 meters). Georgian barberry is endemic to the Caucasus. It is used to treat bleeding, gastrointestinal, and urinary diseases.</p>
	<p>Blueberry - Evergreen or deciduous semi-shrubs or shrubs. There are 4 species in Georgia. It is used for the treatment of diseases of the liver, biliary tract, and urinary organs.</p>
	<p>Plantago - Annual or perennial herbs. 11 species are known in Georgia. It grows from the lower mountain to the alpine, in dry and grassy areas. Its leaves are used to heal wounds and ulcers, the tincture is used as an expectorant, and the juice is used to treat gastritis and enteritis.</p>
	<p>Hippophae - A multi-branched bushy plant. In Georgia, it grows on river bottomlands, mountain slopes, in moist places. The fruit is rich in vitamins. In folk medicine, it is used as a pain reliever, for the treatment of stomach and gynecological diseases.</p>
	<p>St. John's wort (Hypericum) - Perennial, rarely annual herb and shrub-herb. 19 species are known in Georgia. Hypericum is a widespread plant. It can be found both in the low and medium mountains. It is used to treat skin diseases.</p>






	<p><i>Chelidonium majus</i> - Perennial herb, height from 25 to 100 cm. It can be found in the entire territory of Georgia, especially in mountainous regions. Its juice is used to remove warts, pigment spots and blackheads. It is used to treat ulcers, wounds and skin diseases.</p>
	<p><i>Rhododendron (Rhododendron ponticum)</i> — Evergreen, 3-6 meter tall shrub. Widespread in western Georgia - Kolkheti. It is a relict of the tertiary flora. It grows as an undergrowth, from sea level to 1600-1800 m, the tincture of leaves is used to treat heart, nervous system, rheumatism and other diseases.</p>
	<p><i>Cherry laurel</i> - Evergreen shrub or tree-plant, found in Georgia on the upper border of medium mountains, within 1800-2000 meters. A hot decoction or tincture of its leaves is used to treat various malignant neoplasms, gastrointestinal pain, and the fruit to treat heart diseases.</p>
	<p><i>Malus (Malus orientalis Uglitz)</i> - The tree-plant can be found in almost all types of forests in Georgia. More than 200 apple varieties are known here. A decoction of its fruit is used to improve digestion, treat urolithiasis, headache, insomnia, and bronchitis.</p>
	<p><i>Georgian Oak (Quercus iberica)</i> - A deciduous tree native to the Caucasus. Georgian oak is a mature tree that grows to a height of 20-25 meters. Oak bark contains an average of 10-11% tannins, special sugar - carbohydrate levulan and others. Its tincture is used as an astringent and a remedy for skin diseases.</p>

Figure 2: Some types of traditional medicinal plants in Georgia and their characteristics.

and modern medicine. A sharp border cannot be drawn between them, because their healing properties are often the same. Even the plants used in modern medicine can be divided into two subgroups: scientific as medicinal and practical plants. The first includes those plants that are included in the state pharmacopeia and, therefore, their use in medical production is allowed by the Ministry of Health Protection. Medicinal plants that are known to modern medicine as medicinal plants enter in the second group but they are not included in the pharmacopeia. These are the plants that were widely used in folk medicine

(Kutateladze, 1945, Shetekauri, 2013, Kuchukhidze, Jokhadze, 2012).

Among the widely distributed plants on earth, many rare and endemic plants of Georgian flora are used for treatment. However, the same plant can often be used in many ways. Some of them (for example: jimsonweed, dogwood, etc.) are both medicinal and poisonous plants at the same time. This is determined by the composition of various substances in the plant, as well as their use doses. The variety and contrast of the physical-geographical conditions of Georgia,

different Phyto-landscape location determine the special wealth and diversity of the vegetation.

4. ECONOMIC IMPORTANCE OF MEDICINAL PLANT USE

The influence of plants on human health is known from ancient sources. Before the development of medicine and pharmacy, people used only herbal and animal medicines.

Medicinal plants and Phyto preparations obtained from them have the essential advantage that a person receives a complex of related substances, is easily absorbed by the body, rarely causes side effects, and does not have the property of accumulation. Today, about 30% of existing medicinal preparations are made from plant raw materials. Both wild growing and cultivated plants are used as a source of raw materials, this has led to the depletion of useful plant resources in some areas (Khidasheli, Papunidze, 1980, Shengelia, 2012).

Medicinal plants represent almost half of the raw materials needed for the pharmaceutical industry of our country. Georgian folk medicine has been laid since ancient times, and the Georgian nation has the greatest independent culture and traditions of folk medicine.

In our country, the direction of folk medicine was always developed at the level of the needs of the era. Today, Georgia consumes a variety of medicinal plants. In the last few decades, the interest in medicinal plants is growing more and more (WHO, 2008, <https://www.who.int>). According to the data of the same organization, it is believed that by improving the environment and maintaining normal conditions, it is possible to prevent the death of 13 million people every year.

85 of the 102 categories of diseases and injuries in the World Health Report are directly or indirectly affected by environmental factors (WHO, 2015, <https://www.who.int/en/news>).

According to the data of the World Health Organization, 80% of the population of developing countries turn to traditional medicine (herbal medicinal preparations). As for developed countries, traditional medicines are used by 40-50% of the population in Germany, 42% in the USA, 49% in France, and 48% in Australia (<ftp://ftp.fao.org/docrep/fao>).

In the trade of medicinal and essential oil plants, the US and German markets are the largest in terms of both import and export. In recent decades, the US has imported \$1.4 billion worth of medicinal plants and exported \$1.05 billion worth of medicinal plants. In terms of trade in medicinal plants, Germany is the most important country in the East and for Southeast Europe, since 2/3 of medicinal plants from these countries are exported to Germany (Eurostat, 2017, <https://ec.europa.eu>).

Georgia also exports medicinal plants, specifically to Germany. According to the data of the Rural Community Development Agency, women's cooperatives in Mtskheta-Mtianeti municipalities collect various plants, including Primrose, Dandelions, leaves of Black Hawthorn, Elderberry, Dogrose and others.

The growing interest in medicinal and essential oil plants in developing countries, including Georgia, provides new opportunities for the rural population. Promotion of the economic aspect of the production of medicinal plants is important for the population of Georgia. On the other hand, it involves risks related to the reduction of medicinal plants or, in the worst case, their extinction.

Collecting plants in nature is dangerous and not allowed. Many factors allow us to prove this: habitat destruction, their use for commercial purposes, overgrazing in restricted areas, construction of roads and pipelines, deforestation, urbanization, etc. About 250 plant species are consumed by the local population in traditional folk medicine. However, this action of theirs does not pose a threat to natural habitats. It is dangerous to use them for industrial purposes because this fact may lead to the extinction of the species. Many of them are collected periodically when companies have a demand for them. Among them are endangered species. It is unsafe when the root of the plant is useful. This fact increases the risk of its extinction.

An alternative way to preserve biodiversity is field and greenhouse production of medicinal plants. Considering all this, it can be said freely that the collection of medicinal plants for industrial purposes poses a real threat of their disappearance. Therefore, they need protection.

8 types of medicinal plants are included in the Red Book of Georgia. All of them are valuable medicinal plants that are widely available in nature for commercialization.

It should be noted that there is a law "On Medicinal Plants" in force in Georgia, which describes how to use medicinal plants to increase the number of healthy products in the country. It is also written here what should be done to protect them. It is desirable to introduce the method of studying medicinal plants according to regions in schools. This will allow young people to find out which plants they can collect, which ones to protect, which ones to promote reproduction, etc.

CONCLUSION

Medicinal plants in Georgia are actively consumed by locals, which is due to traditions and effectiveness. In Georgia, there are many medicinal plants that are very popular, however, the full potential of medicinal plants is not studied, the population refrains from using traditional remedies in many cases, which is related to the lack of certain information. Among them are: dosage, method of administration, etc. Accordingly, the promotion of this field will lead to an increase in the interest of visitors and intensive exploitation of medicinal plants.

There is a centuries-old history of the use of medicinal plants in Georgia. However, many plants are still unexplored from this point of view. Nevertheless, the demand for medicinal plants is increasing day by day, they could not be replaced by synthetically obtained chemical preparations, on the contrary, their advantage was even more significant due to the fact that the substances obtained as a result of photosynthesis in plants are produced in a living cell, which has a lot in common with an animal cell (general structure, similar biochemical processes and others). The animal cell is fed by the organic substances produced by the plant, therefore it is easy and effective for the human body to take medicinal plants, they are not toxic, they do not cause further negative events in the body. These days, this need is met at the expense of the production of wild adolescent medicinal plants, therefore the unplanned production of wild adolescent medicinal flora poses a danger of their extinction and disappearance, which is reflected in ecological problems.

Geographical features, potential and prospects of medicinal plants use in Georgia are directly related to the awareness of the population. It is also crucial to categorize medicinal plants and determine the regularities of their geographical distribution. Analyzing the ecological features of the distribution of medicinal plants and studying the characteristics of their influence

on human health will help to increase their involvement in pharmacological production, ensure the income of the population and ecological sustainability of plants.

DISCUSSION

For the sustainable exploitation of medicinal plants in Georgia, it is necessary to go through a number of stages, the most important of which are:

1. Publication of information on the use of medicinal plants.
2. Promotion of industrial production of certain types of medicinal plants.
3. Providing information about the technologies of industrial production and exploitation of medicinal plants to the local population.

Treatment with plants is a part of culture in Georgia, and their cultivation and reproduction are uncontrolled, therefore, the expansion of research and relevant measures in this regard will help to rationally use these plants and preserve their diversity.

In all regions of Georgia, we find certain types of medicinal plants. However, it should be noted that due to various anthropogenic and natural factors, it is becoming more and more difficult to preserve these plants. But on the contrary, less popularization of medicinal plants helps the existence of different plants in wild conditions.

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Received on 25-10-2023

Accepted on 20-11-2023

Published on 05-12-2023

DOI: <https://doi.org/10.12974/2311-858X.2023.11.05>

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