

Ethnobotanical research of medicinal plants of the
Kazakhstan Altai used in folk medicine

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SUMMARY

This article presents the results of ethnobotanical research on the study of medicinal plants used in folk medicine in the Kazakhstani part of the Altai mountain system. The research was carried out by polling the local population about the use of medicinal plants in folk practice. As a result of research, information was obtained on 28 species of medicinal plants most known to the population.

Key words: ethnobotany, medicinal plants, folk medicine, Kazakhstan Altai, medicinal raw materials, broth, tincture.

RESUME

This article presents the results of ethnobotanical studies on medicinal plants used in folk medicine of the Kazakh part of the Altai mountain system. The research was conducted by surveying the local population about the use of medicinal plants in folk practice. The studies conducted received information about 28 species most known medicinal plants.

Keywords: Ethnobotany, medicinal plants, traditional medicine, Kazakhstan Altai, medicinal raw materials, decoction, tincture.

The science of ethnobotany is a branch of ethnobiology and studies the interaction of humans with the plant world. Its main task is to know how plants are used and what is their role in human social life. The world of plants is extremely diverse, and the usefulness of the plant world is determined, first of all, by the food and medicinal suitability of plants, their biological expediency [1].

At present, ethnobotanical research of medicinal plants used in folk medicine is a particularly relevant direction in botany. Many people on the territory of Kazakhstan Altai are still treated with folk remedies from herbs. Their herbal treatment secrets have been passed down from generation to generation. However, in recent years, this continuity has been broken, and the most valuable information is irretrievably lost.

Floristic-population ethnophytoecology considers the experience of ethnic groups, focused on certain types of plants (fodder, medicinal, food, etc.), which are economically valuable. The implementation of this aspect includes the search for useful plants, their differentiation by categories of use: medicinal, food, fodder, ornamental, technical, cult, etc. [2].

There are more than 1400 species of wild medicinal plants in Kazakhstan, of which only 230 species are actually used in official medicine [3]. The list of officially recognized types of medicinal plants in Kazakhstan, represented by 260 species, includes, along with wild plants, also cultivated in the territory of the republic plants [4]. The Altai of Kazakhstan has 783 species of medicinal plants from 99 families, of which 87 species are pharmacopoeial in Kazakhstan, the rest are used to varying degrees in folk medicine [5].

Research on the study of medicinal plants used in folk medicine in Kazakhstan was carried out by a number of researchers [1, 6, 7, 8]. It must be admitted that, despite the importance of ethnobotanical research, the study of medicinal plants used in folk medicine in Kazakhstan is not carried out effectively.

Within the framework of the project "Study of medicinal plants of the Kazakhstan Altai, used in official and folk medicine, assessment of their distribution, raw material reserves and the possibility of practical application", a survey was conducted of the local population in remote and mountainous regions of Kazakhstan Altai on the use of medicinal herbs for medicinal purposes.

The purpose of this study was to collect, analyze and summarize information on medicinal plants in the southwestern part of the Kazakhstan Altai used in folk medicine

Materials and methods

The research was carried out during May – September 2015 during expedition trips to the south-western part of the Kazakhstan Altai by interviewing the local population. The average age of the respondents was from 40 to 70 years old; the older generation was preferred in conversations. Interviewed groups of the population, including shepherds, beekeepers, hunters, workers in protected areas, pensioners, people living in distant villages. During the questioning, information was obtained: about the name of plants, parts of plants used as medicinal raw materials (flowers, inflorescences, leaves, stems, fruits, roots), time of collection, form of use, form of pathology. For species diagnostics, the "Flora of Kazakhstan" [9], as well as other reference atlases on medicinal plants were used. Below is a summary of medicinal plants,

Research results

Aconite anthoroideum DC. (Antidote wrestler) of the Ranunculaceae family

Juss. Contains alkaloids, flavonoids and fatty oils [10]. A decoction or tincture of alcohol from the wrestler's tubers stimulates the central nervous system, helps with impotence, and is also a general tonic for depleting the body. Raw materials are harvested in September-October at the end of the growing season of the plant.

Artemisia dracunculus L. (Tarragon wormwood) from the Asteraceae Dumort family. Contains essential oil, steroids, vitamins, coumarins, flavanoids, cyclitols, alkaloids, rubber [11]. A decoction or alcoholic tincture from the aerial part of the plant is applied externally in the form of compresses or baths for rheumatism, and is used internally to treat hemorrhoids. Raw material procurement time is June-August.

Artemisia sieversiana Willd. (Sievers Wormwood) from the Asteraceae family. Contains essential oil, alkaloids, vitamins, tannins, phenol carboxylic acids, coumarins, flavanoids [11]. An infusion of wormwood inflorescences on alcohol is drunk as an anti-fever remedy. Raw materials are harvested in June-July during flowering.

Actaea erythrocarpa Fisch. (Red-crowned crow) from the family Ranunculaceae Juss. Contains alkaloids, vitamins, saponins [10, 12]. A decoction or alcoholic tincture of the fruit is used to treat malignant tumors. Raw materials are harvested in August-September during the ripening of the fruit.

Agrimonia pilosa Ledeb. (Thistle hairy) from the family Rosaceae Juss. Contains phenolic compounds, tannins, flavonoids [13]. A decoction of the ground part of the plant prevents bloating and relieves inflammation of the stomach. Raw materials are harvested in August-September.

Alfredia cernua (L.) Casso (Alfredia drooping) from the Asteraceae family. Contains triterpenoids, phenol carboxylic acids, flavonoids, coumarins [14]. A decoction of inflorescences is used for stomach cramps, urinary incontinence and hernia, it is used by the local population of Kazakhstan Altai as a surrogate for tea. Raw materials are harvested in August – September during flowering.

Bidens tripartita L. (Tripartite train) from the Asteraceae family. Contains carbohydrates and related compounds, organic acids, essential oil, steroids, vitamins, tannins, flavonoids, auronos, carbohydrates, lipids [11]. The flowers are used externally in the form of baths for the treatment of childhood scrofula. Raw materials are harvested in June.

Bergenia crassifolia (L.) Fritsch (Badan thick-leaved) from the family Saxifragaceae DC. Contains flavonoids, isocoumarins, carbohydrates, sugar esters, phenols, phenolic glycosides, tannins, vitamins [12? thirteen]. The dried leaves are brewed and consumed for stomach pains and to normalize blood pressure. Juice from fresh leaves is used as a remedy for diabetes, baths and lotions from a decoction of brown leaves and rhizomes - for hemorrhoids, eye inflammation, sunburn, as a cosmetic and as a surrogate for tea. Raw materials are harvested throughout the growing season.

Dictamnus angustifolius G. Don fil. ex Sweet (Narrow-leaved ash) from the Rutaceae Juss family. Contains carbohydrates, alkaloids, organic acids, terpenoids, steroids, coumarins, flavonoids, tannins, essential and fatty oils [15]. A decoction of the herb is used as an anti-febrile remedy, juice or pounded fresh herb - for the treatment of epidermophytosis. The grass is harvested in the phase

flowering.

Gentiana grandiflora Laxm (Large-flowered gentian) from the Gentianaceae Juss family. A decoction of flowers is used to treat the cardiovascular system and normalize heart rate and blood pressure. The raw materials are harvested during flowering.

Humulus lupulus L. (Common hops) from the family Cannabaceae Endl. Contains flavonoids, alkaloids, higher fatty acids, saponins, vitamins, essential, fatty mustard oil [18, 12]. A decoction of cones is drunk with inflammatory processes of the prostate gland. Raw materials are harvested in July – August.

Hedysarum theinum Krasnob (Tea penny, Red root) from the Fabaceae Lindl family. Contains monosaccharides, disacchards, tannins, vitamin C, carotene, substances of a xanthonic nature, mangiferin and isomangiferin [17]. A decoction from the roots of the penny root is used to treat the liver and stomach, it is used as an astringent or as a surrogate for tea. Raw materials are harvested in early spring or late autumn.

Hyssopus ambiguus (Trautv.) Iljin (*Hyssopus dubious*) from the Lamiaceae Lindl family. Contains essential oil, triterpenoids [18]. A decoction of the herb is used externally in the form of lotions and poultices as an antirheumatic agent. Raw materials are harvested in June, July.

Larix sibirica Ledeb. (Siberian larch) from the Pinaceae Lindl family. Contains terpenoids, steroids, flavonoids, aromatic compounds, vitamins, fatty oil, resin, gum [12]. Larch bark decoction is used to lower blood pressure and normalize heart rate. Raw materials are harvested in winter, autumn and spring.

Mentha Asia Boriss. (Asiatic mint) from the Lamiaceae family. Contains essential oils, vitamin C, carotenes, catechins and leukoanthocyanins [19]. A decoction of the herb is drunk as a sedative for headaches and as an antipyretic for colds. Outwardly in the form of baths, as a sedative or cosmetic. The raw materials are harvested during flowering.

Scabiosa ochroleuca L. (*Scabiosa yellow*) from the Dipsacaceae Juss family. Contains flavonoids, alkaloids, saponins, steroids, triterpenoids, organic and phenol carboxylic acids, coumarins, tannins, vitamins [12, 20]. A decoction of the herb is used for headaches, externally in the form of baths used for epilepsy. Raw materials are harvested in summer during flowering.

Stemmacantha chartamoides (Willd.) M. Dittrich (*Rhaponticum carthamoides* (Willd.) Ilhin) Contains steroids, sterols, sesquiterpene lactones, phenolic acids, triterpene saponins, quinones, flavonoids, etc. [12, 21]. Tincture of roots in alcohol is used as a tonic and tonic, to increase immunity and hemoglobin in the blood. Decoctions from the roots are drunk with sexual impotence.

Origanum vulgare L. (*Oregano vulgaris*) from the Lamiaceae family. Contains essential and fatty oils, terpenoids, alkaloids, flavonoids, coumarins, anthocyanins, carbohydrates, steroids, saponins, tannins, organic and phenol carboxylic acids, vitamins [12, 18]. Drink herb decoction

for insomnia, headaches, to improve digestion and as a diaphoretic. The raw materials are harvested during flowering.

Pinus sibirica Du Tour (Siberian Pine) from the Pinaceae family. Contains terpenoids, carotenes, lignans, steroids, coumarins, flavonoids, phytosterols, cyclitols, carbohydrates, phenolic acids and their esters, higher fatty acids, aliphatic carbohydrates and alcohols, aromatic compounds, tannins, vitamins, sap, essential and fatty oils [12]. Nuts from mature cones insist on alcohol and are used for coughs and colds, externally used in the form of compresses for cervical osteochondrosis. Cones are harvested in late autumn.

Populus tremula L. (Trembling poplar, aspen) from the Salicaceae Mirb family. Contains lignans, flavonoids, chalcones, terpenoids, steroids, carotenoids, carbohydrates, phenolic acids and their esters [12, 16]. A decoction of the bark is used for diabetes. Bark decoction baths are used as an anti-inflammatory agent for acute rheumatic pains, acute attacks of osteochondrosis and gonorrhea. Raw materials are harvested in autumn, winter and spring.

Pulmonaria mollis Wulf. ex Hornem. (*Medunica* soft) from the Boraginaceae Juss family. Contains flavonoids, cyclitols, carbohydrates, nitrogen-containing compounds, phenolic acids, tannins, anthocyanins, vitamins [12, 20]. A decoction of the herb is used externally in the form of baths and lotions as a hemostatic agent for hemorrhoids and open wounds. Raw materials are harvested in spring during flowering.

Paeonia anomala L. (Peony Maryin root) from the Paeonaceae Rudolphi family. Contains terpenoids, phytosterols, flavonoids, carbohydrates, coumarins, quinones, saponins, phenolic glycosides, acids and esters, tannins, essential and fatty oils [12, 16]. A decoction of tuberous root thickenings is used for gynecological diseases and coughs. Alcohol tinctures are used as an antineoplastic agent. Raw materials are harvested in the fall.

Rumex confertus Willd. (Horse Shavel) from the Polygonaceae Juss family. Contains organic acids and their salts, essential oil, vitamins, tannins, carbohydrates, saponins, alkaloids, phenols, catechins, flavonoids [10]. Baths from a decoction of rhizomes are used for hemorrhoids, a decoction of green fruits and rhizomes - inside for bloody diarrhea. Rhizomes are harvested in late autumn.

Rhodiola quadrifida (Pall.) Fisch. et CA Mey. (*Rhodiola* four-membered, red brush) from the Crassulaceae DC family. Contains organic and phenol carboxylic acids, phenols and their derivatives, steroids, tannins, coumarins, anthraglycosides [12, 20]. Tincture of alcohol is used to treat the stomach and as an anticancer agent. Rhizomes are harvested in early spring or late autumn.

Rhodiola rosea L. (*Rhodiola rosea*, golden root) from the Crassulaceae DC family. Contains carbohydrates, alkaloids, organic and phenol carboxylic acids, terpenoids, steroids, coumarins, flavonoids, aromatic compounds, tannins, essential oil [12, 20]. A decoction or tincture of alcohol from the roots of *Rhodiola* raises blood pressure, stimulates the central nervous system. Rhizomes are harvested in early spring or late autumn.

Urtica urens L. (Stinging nettle) from the family Urticaceae Juss. Contains organic acids, vitamins, nitrogen-containing compounds [10, 12]. A decoction of the leaves is used for fever in the form of a compress. Leaves are harvested in June – July.

Veratrum lobelianum Bernh. (Lobel's hellebore) from the Melanthiaceae Batsch family. Contains alkaloids, flavonoids, fatty oil, higher fatty acids [22]. In folk medicine of Kazakhstan Altai, a herbal decoction is used in the form of tea for chronic colds in children, for dry coughs, headaches, baths from decoction of leaves are used as a cosmetic product. For medicinal purposes, brown leaves are collected in the seed ripening phase.

Ziziphora clinopodioides Lam. (Fragrant Zizifora) from the Lamiaceae family. Contains essential oil, saponins, coumarins, flavonoids [18]. A decoction of the herb is drunk to normalize blood pressure. Raw materials are harvested in summer during flowering.

The discussion of the results

As a result of ethnobotanical research, information was obtained on 28 types of medicinal plants, the most famous and widely used by the local population of the Kazakhstan Altai. Analysis of the survey results showed that most of the population of Kazakhstan Altai uses medicinal plants for the treatment of the cardiovascular system (19%), the digestive system (16%), for the treatment of the central nervous system (11%), colds (11%), malignant tumors (9%), antifebrile agents (8%), the rest are used for other diseases. Of the 28 medicinal plants cited as a result of the survey, 10 species are pharmacopoeial and 18 are used in folk medicine.

The analysis of the results of ethnobotanical studies of medicinal plants used in folk medicine of the Kazakhstan Altai, and literary sources showed that, for the first time, the use of: an antidote fighter to stimulate the central nervous system with sexual impotence; hellebore Lobel with chronic colds in children, with dry cough and headaches; large-flowered gentian for the treatment of the cardiovascular system; wormwood tarragon for the treatment of hemorrhoids; Siberian larch bark to lower blood pressure; scabiosa yellow with epilepsy.

conclusions

1. The conducted research has allowed to obtain new data on the use by local residents of 28 species of medicinal plants in Kazakhstan Altai for medical purposes.

2. Of the 28 studied species, 10 are official, but they are used among the people on broader indications, in comparison with the officially approved types of action.

3. Newly revealed experience of using 18 plants in traditional medicine allows us to consider them as promising species for further study and scientifically grounded implementation in medical practice.

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