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New Findings in the Ethnobotany of Uzbekistan

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Abstract: This research provides information about the significance and use of some wild flora plants such as *Atraphaxis pyrifolia* Bunge and *Megacarpaea gigantea* Regel in folk medicine by the local population of some districts of Samarkand and Navoi regions of the Republic of Uzbekistan. The above-listed species are little known to official medicine, but local traditional healers have been using them for many years and have a proven record of applying these plants in the treatment of various human diseases. For example, infusion of leaves of *Atraphaxis pyrifolia* is used by local people for cardiovascular diseases, insomnia, and as a sedative, seeds of *Megacarpaea gigantea* for treatment of kidney and cholelithiasis, as well as inflammation of the kidneys. However, the plant raw materials are collected from natural places of distribution which may cause a process of the natural deterioration of their supply in future and the sale of dried parts is carried out by traders in the markets or local traditional healers. Thus, this study implies how crucial it is to develop a prospect for the use of medicinal plants in Uzbekistan, and its significance in terms of improving the economy of the region, improving the quality of life of the population and improving the health of the nation.

Keywords: Medicinal plant, Human diseases, Flora, Uzbekistan, Ethnobotany.

Introduction

For centuries, medical plants herbs have been widely used in traditional medicine and are still actively applied in a variety of cases. Initially, by trial and error, and then with some skill and experience, a person began to use natural remedies of plant origin to treat diseases or ailments, and thus knowledge of useful plants with their medicinal effect appeared (Fitzgerald et al., 2020). The use of medicinal plants/herbs has been gradually improving over many generations, and eventually, this was a crucial step which lead to a rise in the development of traditional medicine. The official definition of traditional medicine can be seen as “a body of knowledge, skills and practices based on theories, beliefs and experiences, inherent in different cultures, explainable or inexplicable, used to maintain health, as well as to prevent, diagnose, improve or treat physical and mental illnesses” (World Health Organization, 2000).

Nowadays, the actual database of flora in Uzbekistan has more than 4385 wild species. Since the publication of the first edition of the “Flora of Uzbekistan”, at least 712 additional wild species have been added to the national control list, while the six-volume edition of the Flora of Uzbekistan (1941–1962) contains 4148 species (138 families, 1023 genera), including 3663 native and 485 aboriginal species (Li et al., 2020). According to Belolipov et al. (2015), the largest number of plant species of the natural flora of Uzbekistan with medicinal qualities is found in such families as Apiaceae Lindl., Lamiaceae Martinov, Asteraceae Bercht. & J. Presl, Brassicaceae Burnett., Rosaceae Juss., Liliaceae Juss. and Fabaceae Lindl. In addition, over 200 species are broadly used in traditional medicine.

In recent years, the Republic of Uzbekistan has been implementing consistent reforms and adopting a number of governmental decisions on the protection of medicinal plants, the rational use of natural resources, and the construction of plantations for the cultivation of medicinal plants and their (processing/recycling, refining). Of

the wild representatives of the flora of Uzbekistan, 112 species of medicinal plants are registered for use in scientific medicine, of which 70 species are actively used in the pharmaceutical industry (Eshpulatov et al., 2021).

It must be noted that with the latest technological evolution of medicine production and the process of producing synthetic chemicals, many different people and ethnic groups still often use medicinal herbs to treat various diseases and ailments. However, for several reasons, some of them are not registered in the state registries of pharmacopoeial species, are poorly studied, or are under research.

Materials and Methods

We reviewed the markets of Samarkand and Navoi regions to obtain general information about the healing properties of medicinal plants mainly used by the locals and their commercial form. The survey of the local population was conducted in the form of a questionnaire with the acknowledgement of the respondents. The interviews were conducted strictly following the rules of the Code of Ethics established by the International Society for Ethnobiology (The ISE Code of Ethics, 2006). All data received from the respondents were recorded in a special form.

Results and Discussion

As a result of these scientific trips to the Samarkand and Navoi regions, we conducted an ethnobotanical analysis/survey of people involved in the process of preparation and sale of medicinal herbs and traditional healers. During the expeditions in the Kattakurgan and Narpay districts of the Samarkand region, as well as the city of Navoi of the Navoi region, medicinal, spicy-aromatic, food plant species from the local flora and those imported from foreign countries were identified. As a result, we have identified about 50 plant species belonging to various genera and families sold in the markets of the studied regions (refer to the table below).

Table 1.Taxonomic composition of the examined plants

№	Plant family	Number of genus	Number of species
1	Apiaceae Lindl.	3	4
2	Araceae Juss.	1	1
3	Asteraceae Bercht. & J.Presl	9	9
4	Berberidaceae Juss.	1	1
5	Brassicaceae Burnett.	1	1
6	Crassulaceae J.St.-Hil.	1	1
7	Cucurbitaceae Juss.	2	2
8	Equisetaceae Michx. ex DC.	1	1
9	Fabaceae Lindl.	4	4
10	Gentianaceae Juss.	1	1
11	Hypericaceae Juss.	1	2
12	Iridaceae Juss.	1	1
13	Lamiaceae Martinov	5	5
14	Lauraceae Juss.	2	2
15	Papaveraceae Juss.	1	1
16	Poaceae Barnhart	1	1
17	Polygonaceae Juss.	3	3
18	Ranunculaceae Juss.	1	1
19	Rosaceae Juss.	3	3
20	Rubiaceae Juss.	1	1
21	Solanaceae Juss.	1	1
22	Urticaceae Juss.	1	1
23	Zingiberaceae Martynov	2	2
TOTAL:		47	49

The given table above demonstrates that the leaders in the number of species among medicinal, spicy-aromatic, food plant species belong to the family Asteraceae (9/18.3%), then following with by several families - Lamiaceae (5/10.2%), Apiaceae (4/8.2%), Fabaceae (4/8.2%) and Polygonaceae (3/6.1%). Finally the

remaining families are represented by either two or one species. In this analysis, we took into account all plant species, regardless of their practical application and place of origin, that is, whether the studied species were representatives of the flora of Uzbekistan or introduced plants or imported plants from near and far abroad.

Over the course of these studies, several types and medicinal collections were identified that are used by the locals as a method of treatment for many well-known diseases. For example, *Atraphaxis pyrifolia*, *Astragalus sieversianus* Pall., *Leonurus turkestanicus* V.Krecz.&Kuprian., *Hypericum perforatum* L., *Ziziphora pedicellata* Pazij et Vved., *Mentha piperita* L., *Melissa officinalis* L., *Cichorium intybus* L., *Berberis integerrima* Bunge, *Megacarpaea gigantea*, *Crataegus turkestanica* Pojark., *Arum korolkowii* Regel, *Equisetum arvense* L., *Achillea millefolium* L., *Helichrysum maracandicum* Popov ex Kirp., *Hypericum scabrum* L., *Tussilago farfara* L., *Salvia sclarea* L., *Rhodiola hetrodontha* (Hook. f. et Thomson) Boriss., *Rheum maximowiczii* Losinsk., *Inula grandis* Schrenk, *Urtica dioica* L., *Tanacetum pseudachillea* C. Winkl., *Cichorium intybus* L., *Rosa webbiana* Wall. ex Royle, *Berberis integerrima* Bunge, etc.

However, almost all species of identified plants have long been used both in traditional and modern medicine, except for the little-known local species of *Atraphaxis pyrifolia* and *Megacarpaea gigantea*. Both species grow on the territory of the Republic of Uzbekistan, and the local population collects the raw plant materials. The habitat of *Megacarpaea gigantea* includes the Kok-Suv ridge of the Western Tien Shan and the Zaravshan, Aktau, Nuratau, and Gissar ridges of the Pamir-Alai mountain system. The species occurs most frequently in Samarkand and Kashkadarya oblasts, where it is mainly collected by the local population for ethnobotanical purposes.

Atraphaxis pyrifolia can be found on the slopes of the lower and middle mountain zones in the Tashkent, Ferghana, Namangan, Samarkand, Jizzak, Kashkadarya, Surkhandarya and Navoi regions of Uzbekistan. When conducting ethnobotanical research, an important aspect is a search for new recipes for the preparation of medicinal decoctions, infusions, teas, ointments, collections, and other remedies and medicines used by the locals only to introduce them to a larger audience.

According to local traditional healers and people who are trading various herbal products, *Megacarpaea gigantea* seeds have been commonly used for many decades for medicinal purposes. As a remedy for kidney stones, cholelithiasis and inflammation of the kidneys, the people of these areas use the seeds of this plant. It is recommended to chew one seed half an hour before a meal for a period of 1-3 months. An infusion of the leaves of *Atraphaxis pyrifolia* is recommended to drink to improve heart activity and blood circulation, also for headaches, insomnia, and tinnitus, and to increase the general tone of the body. For this purpose, take 1 tsp dried crushed leaves and pour 200 ml into a glass of boiling water, then cool at room temperature, strain, and squeeze the remaining raw material. Drink 1/4 cup 3-4 times a day.

Conclusion

In summary, the analysis of the state of use of medicinal plants of domestic flora showed the need to increase ethnobotanical research in all regions of the country. As part of this study, we have identified promising but understudied medicinal plants from the local flora - *Atraphaxis pyrifolia* and *Megacarpaea gigantea*, with their original recipes created and tested over generations by traditional healers and residents. Today, due to the low toxicity and milder effect on the body of herbal medicines, many residents of our country use wild plants of local flora for the treatment and prevention of diseases. In this regard, it is necessary to conduct targeted research to develop the production of local herbal remedies, improve technologies for isolating biologically active substances, and establish their chemical structure, modification and purification.

Scientific Ethics Declaration

The author declares that the scientific ethical and legal responsibility of this article published in EPHELS journal belongs to the author.

Acknowledgements or Notes

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