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An Ethnobotanical Study on Plants Used in the Treatment of Gynecological Diseases in Some Provinces of the Eastern Anatolia Region

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Abstract

This work was supported by "The Republic of Turkey Ministry of Agriculture and Forestry General Directorate of Nature Conservation and National Parks." It was carried out to document the plants used by people living in and around Ardahan, Iğdır and Kars provinces between 2020-2021 for gynecological diseases. For this purpose, medicinal plants used by the public for therapeutic purposes were collected and determined, their use, and parts used were reported, and herbarium samples were prepared. Regular visits were arranged to the regions where the research was carried out, and surveys were conducted by interviewing and speaking with the area's people. It was determined that 34 medicinal plant taxa belonging to 18 plant families were used in gynecological diseases among the people of Ardahan, Iğdır and Kars provinces and their surroundings. These plants include 26 wild species and 7 cultivated species. It has been observed that the most commonly used medicina plant families in gynecological diseases are Asteraceae (6), Malvaceae (5) and Lamiaceae (3). Although traditional medicine is widely practiced in the regions where it is studied, it is rapidly being replaced by modern medicine and pharmacy.

Keywords: Eastern Anatolia, gynecological diseases, Ardahan, Iğdır, Kars

1. INTRODUCTION

The term ethnobotany was first introduced by the American botanist Dr. John William Hershberger during a conference in Philadelphia in 1895. He utilized this term to describe his research on "plants produced by primitive and indigenous peoples. Ethnobotany is defined as the study of the direct relationship and interaction between human populations and plants in different cultures. Ethnobotany investigates interactions and relationships between plants and humans. It has been reported that out of

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approximately 4.22 million flowering plants in the world, more than 50,000 are utilized for medicinal purposes. The World Health Organization (WHO) has shown that 80% of the world's population depends on traditional medicines, and the majority of these treatments involve plant extracts. In fact, three-quarters of the world's population cannot afford modern medicines and rely on traditional herbal drugs. Until the mid-19th century, herbs were the primary therapeutic agents utilized by people, and their role in medicine remains significant today. In the late 19th century, ethnobotany began to improve as a science offering novel tools for pharmaceutical search. Public institutions such as the WHO and private pharmaceutical companies have started investing in ethnobotanical discoveries [1].

Medicinal herbs are a significant component of local medicinal systems around the world. Ethnobotanical accumulation is accepted as part of a cultures "traditional" knowledge. For many years, Europe benefited from the ancient accumulation of local cultures, especially in newly discovered regions. Most of the modern drug molecules and some phytotherapeutic preparations utilized today are derived from herbs found in the traditional knowledge of indigenous cultures. In the 18th century, explorers such as British Richard Spruce and German Alexander von Humboldt studied the use of plants by indigenous communities in detail, including the preparation of curare, which was used as an arrow poison in South America and later became famous as an important muscle relaxant. The role of ethnobotany in the search for new drugs remained important until the second half of the 20th century, when other approaches became more popular [2].

The Eastern Anatolia Region is a mountainous and high region that is rich in terms of physical geography due to the mountains extending in the east-west direction and the basins between these mountains. While fertile agricultural areas are found in intermountain basins and tectonic depressions, high mountains are important grazing areas. In this context, the region can be considered an important agriculture and animal husbandry area of our country. The region has difficult conditions, especially with its climatic and geographical structure. The reflection of environmental conditions on the cultural process and the traceability of this reflection through the data obtained through the studies carried out are of great importance [3, 4].

An estimated one million women in the world are exposed to urogenital infections such as non-sexually transmitted urinary tract infections and bacterial vaginosis every year. At least 75% of women have a history of genital infections. In various studies carried out in Turkey, genital tract infection was found to be a common problem. In a study, genital infections were found in 65.6% of women. Vaginal infections are diseases that can be treated and prevented or complications can be reduced with early diagnosis and treatment. Although it may not be commonly discussed, vaginal infections are a significant health issue due to their high prevalence and potential complications. These infections can lead to various problems, such as negative impacts on body image, an increase in vaginal symptoms or unpleasant odors, fear of contracting sexually transmitted diseases or cancer, avoidance of sexual activity due to pain or discomfort, physical fatigue and weakness, psychological issues, and anxiety about infertility. Additionally, they can result in economic losses, loss of time, and decreased workforce productivity. [5]. Numerical data on the use of medicinal plants in Ilıca (Erzurum) were evaluated and it reported that the rate of plants used in gynecological diseases and diabetes was 4.2% [6]. Numerical data on the use of medicinal plants in Iğdır were evaluated and it was reported that the ratio of plants used in gynecological diseases was 5.35% [7]. This research examined traditional plants used in gynecological diseases among the people in Ardahan, Iğdır and Kars provinces and their surroundings between 2020-2021.

2. MATERIALS AND METHODS

2.1. Study Areas

Study area
The Eastern Anatolia region, where the provinces selected as the study area are located, are neighbors of Central Anatolia Region in the west, Azerbaijan and Georgia in the northeast, Southeastern Anatolia Region and Iraq in the south, and Iran and Armenia in the east. Due to its geographical location, it has become an important crossroads for ancient communities/civilizations. The region is the highest region of our country and due to this feature, the winters are very harsh and rainy, and the summer season is short and dry. It is a region that is not very suitable for life with its rugged lands. For this reason, since ancient times, settlements have been established in suitable habitats, that is, on flat plains. Despite these difficult geographical conditions, the region has been the residence of many communities throughout the ages. The most important factor in this is rich natural resources and pasture areas of great importance for animal husbandry. The region is geographically divided into four sub-sections: "Upper Euphrates Section", "Erzurum-Kars Section", "Upper Murat Van Section" and "Hakkari Section" [8]. (Figure 1).

Figure 1 The location of the study areas in the region.

2.2. Data collection

Within the scope of the study, information was compiled by face-to-face interview method in field studies carried out in 120 villages (Ardahan-40, Iğdır-30 and Kars-50). In order to identify people with traditional knowledge, general information about the project was given by contacting the mukhtar beforehand and information was obtained about people with traditional knowledge. People with traditional knowledge were informed about the content of the project through the headmen and they were made available during the fieldwork. In addition, interview-based interviews were conducted with people in village coffeehouses, mosques, village/district solidarity/association unions, public education centers, agricultural chambers and cooperatives through questions and answers. Of the informants, 121 were women and 48 were men.

2.3. Plant Samples

Plants were collected from selected villages of Ardahan, Iğdır and Kars provinces between 2020-2021. Herbarium materials are kept in Atatürk University Biodiversity Application and Research Center and Iğdır University Biodiversity Application and Research Center herbariums. The collected plants were identified using "The Flora of Turkey and East Aegean Islands." [9,10]. Scientific names of plant species have been updated using the relevant databases (www.worldfloraonline.org.). [11].

3. RESULTS

Demographic characteristics of the participants were recorded through face-to-face interviews. Demographic characteristics of the participants are presented in Table 1.

It was determined that a total of 34 plant taxa belonging to 18 plant families were used in gynecological diseases among the people of Ardahan, Iğdır and Kars provinces and their surroundings. Of these, 27 are natural and 7 are cultivated plants. Detailed information about the family, Latin/scientific-local names, usage patterns and the relevant region of the plants used are given in Table 2.

Table 1 Demographic characteristics of the participants.

Demographic characteristics	Number
Age	*Total=169*
31-40	9
41-50	37
51-60	50
61-70	42
70 above	30
Gender	*Total=169*
Female	121
Male	48
Educational level	*Total=169*
Illiterate	82
Primary school	73
Secondary school	11
High school	3
Employment status	*Total=169*
Housewife	121
Farmer	32
Pensioned	12
Shepherd	2
Other jobs	2

Table 2 Plants used in gynecological diseases in ardahan, iğdır and kars provinces and surroundings.

Family Name	**Species Name**	**Local Name**	**Usage methods**	**Province**	**Herbarium No.**
Amaryllidaceae	*Allium cepa* L.*	Soğan	Lightly cooked onion is used externally for the fall of the umbilical cord.	Iğdır	-
			Onion peels are boiled with water and this mixture is placed in a jar. Drink a glass every morning on an empty stomach. So you have a child.	Kars	
Asparagaceae	*Asparagus officinalis* L.	Merajo	The fruits of the plant are eaten in the morning on an empty stomach for infertility.	Iğdır	ATA/G-27
Asteraceae	*Achillea millefolium* L.	Sarıçiçek, Kılıç otu	The decoction prepared with flowers is drunk 3 times a day on an empty stomach for menstrual cramps.	Kars	ATA/G-3
			The decoction prepared with the aerial parts of the plant is consumed in gynecological diseases.	Kars	
Asteraceae	*Arctium platylepis* (Boiss. & Bal.) Sosn. ex Grossh.	Gabalak	Leaves of *Arctium platylepis*, *Malva neglecta* and *Plantago major* are mixed and beaten. It is then boiled with milk. This mixture is wrapped around the belly of the woman who wants to get pregnant and left for 1-2 hours.		INWM000035
Asteraceae	*Helichrysum plicatum* DC.	Nego	The decoction prepared with the flowers of the plant is drunk against infertility.	Ardahan	INWM000030
Asteraceae	*Helichrysum arenarium* (L.) Moench	Altın otu	If the decoction prepared with the flowers of the plant is drunk on an empty stomach in the morning for 1 week, those who do not have children will have children.	Kars	ATA/G-238
Asteraceae	*Cirsium macrobotrys* (C. Koch) Boiss.	Meryemana	Decoction prepared with the flowers of the plant is drunk 1 tea glass on an empty stomach during menstruation against menstrual pain.	Kars	ATA/G-239

Table 2 Plants used in gynecological diseases in ardahan, iğdır and kars provinces and surroundings. (continue)

Asteraceae	*Tanacetum coccineum* (Willd.) Grierson	Sender	The aerial parts of the plant are collected and boiled in water. It is added to the bath water and the genital area is washed with this water for the treatment of infertility.	Ardahan	ATA/G-209
Asteraceae	*Tanacetum vulgare* L.	Sendel	The decoction prepared with the aerial parts of the plant is drunk by women who do not have children.	Kars	ATA/G-240
Boraginaceae	*Alkanna tinctoria* (L.) Tausch	Havaciva, Havajo, Havaciva, Sormuk	The roots of the plant are collected, roasted in butter, wax is put on it and roasted a little more, the prepared mixture is kept at room temperature and applied to wounds and cracks after birth.	Ardahan	INWM000051
			The whole plant is dried and ground into powder, then baked with flour and oil. This mixture is used externally in gynecological diseases by applying it to the genital area.	Iğdır	
			Decoction prepared with plant roots is drunk in menstrual pain (1 glass of water in the mornings for 3 days).	Kars	
			A childless woman sits on hot water after boiling the aerial parts of *Alkanna orientalis*, *Malva neglecta* and *Plantago major*.	Iğdır	
Boraginaceae	*Alkanna orientalis* (L.) Boiss.	Havaciva, Havajo, Havaciva	The aerial parts of *Alkanna tinctoria, Malva neglecta* and *Plantago major* are boiled and a childless woman sits in hot water.	Iğdır	ATA/G-8
Capparaceae	*Capparis spinosa* L.	Gundrabeji, Kapari	The decoction prepared with the fruits of the plant is drunk in uterine inflammations.	Iğdır	
Caprifoliaceae	*Cephalaria procera* Fisch. & Avé-Lall.	Polya	The decoction prepared with the seeds of the plant is drunk in the morning on an empty stomach for menstrual pain.	Ardahan	ATA/G-53
Cucurbitaceae	*Cucurbita pepo* L.*	Gundribeji	Fruit seeds are removed and crushed with stones. Add garlic and green lentils and cook. The prepared mixture is fed to the woman who wants to have a child 3 days in a row.	Kars	-
Fabaceae	*Glycyrrhiza glabra* L.	Şirinbiyan	The woman who wants to have a child is seated on the water obtained by boiling the roots of this plant.	Iğdır	ATA/G-241
Gentianaceae	*Gentiana lutea* L.	Camışkıran	Drink 1 glass of the decoction prepared with the whole plant on an empty stomach for infertility.	Kars	INWM000043
Lamiaceae	*Lavandula stoechas* L.*	Karabaş otu	The decoction prepared with the aerial parts is drunk as an anti-inflammatory.	Kars	-
Lamiaceae	*Mentha longifolia* (L.) L.	Yarpuz	The flowering aerial part is added to the bath water. It relieves inflammation in gynecological diseases.	Ardahan	INWM000032
Lamiaceae	*Teucrium polium* L.	Sancı otu, Mervend, Mervende	The decoction prepared with the aerial parts of the plant is drunk for menstrual pain.	Iğdır	ATA/G-211
Malvaceae	*Alcea hohenackeri* Boiss.	Hatmi çiçeği, Hiro	The genital area of women without children is exposed to the steam of the boiled marshmallow flower. Drink 1 glass of the decoction prepared with flowers on an empty stomach in the morning for 1 week.	Kars	ATA/G-7
			The decoction prepared with the flowering aerial parts of the plant is drunk for infertility.	Kars	

Table 2 Plants used in gynecological diseases in ardahan, iğdır and kars provinces and surroundings. (continue)

Malvaceae	*Alcea striata* Alef.	Hiro	The flowers of the plant are boiled and used as an anti-inflammatory in gynecological diseases.	Iğdır	ATA/G-242
			The decoction prepared with the plants above-ground parts is drunk in uterine inflammations.	Iğdır	
			It is used as a decoction prepared with the flowers of the plant and as an anti-inflammatory in gynecological diseases.	Iğdır	
Malvaceae	*Alcea calvertii* (Boiss.) Boiss	Gülhatı	An infusion prepared with flowers is given to the childless woman.	Ardahan	ATA/G-6
Malvaceae	*Alcea apterocarpa* Boiss.	Hiro	The decoction prepared with the flowers of the plant is used as an anti-inflammatory in gynecological diseases.	Iğdır	ATA/G-243
Malvaceae	*Malva neglecta* Wallr.	Gorgut Dolik, Ebemgümeci Ebem Kömeci, Ebemgümeci Ebe Kömeci Ebemkömeci Doldolig, Dolig, Ebegümeci	The leaves of the plant are boiled. It is inserted into the vagina to relieve inflammation.	Ardahan	INWM000039
			The decoction prepared with the aerial parts of the plant is drunk as an anti-inflammatory in gynecological diseases.	Ardahan	
			The aerial parts are boiled in milk. The woman who wants to have a child sits on it.	Iğdır	
			The decoction prepared with the aerial parts of the plant is drunk as an anti-inflammatory in gynecological diseases.	Ardahan	
			The decoction prepared with the aerial parts of the plant is drunk as an anti-inflammatory in gynecological diseases.	Iğdır	
			The aerial parts of *Alkanna tinctoria*, *Alkanna orientalis* and *Plantago major* are boiled and the childless woman sits in hot water.	Iğdır	
			Childless woman sits on hot water after *Malva neglecta* leaves and *Plantago lanceolata* leaves are boiled.	Iğdır	
			Leaves of *Arctium platylepis*, *Malva neglecta* and *Plantago major* are mixed and beaten. It is then boiled with milk. This mixture is wrapped around the belly of the woman who wants to get pregnant and left for 1-2 hours.	Iğdır	
			Women who do not have children are fed a meal prepared from the above-ground parts.	Iğdır	
			The childless woman sits in the decoction prepared with the above-ground parts of the plant.	Iğdır	
			The decoction prepared with the leaves of the plant is drunk twice a day for menstrual pain during menstruation.	Kars	
			The decoction prepared with buds is drunk 2 times a day for uterine inflammation.	Kars	
Pinaceae	*Pinus sylvestris* L.	Çam, Kara katran	Prepared with young, green pine cones, the decoction is drunk in the morning on an empty stomach as a menstrual cramp.	Ardahan	INWM000026
			The decoction prepared with pine cones from the plant is given to women with labor pains 2-3 times.	Kars	
Plantaginaceae	*Plantago lanceolata* L.	Pelheves	After the leaves of the plant are crushed, it is used externally for uterine inflammation.	Iğdır	ATA/G-164
			Childless woman sits on hot water after *Malva neglecta leaves* and *Plantago lanceolata* leaves are boiled.	Iğdır	

Table 2 Plants used in gynecological diseases in ardahan, iğdır and kars provinces and surroundings. (continue)

Plantaginaceae	*Plantago major* L.	Bağa Yaprağı, Pelheves	Leaves of *Arctium platylepis*, *Malva neglecta* and *Plantago major* are mixed and beaten. It is then boiled with milk. This mixture is wrapped around the belly of the woman who wants to get pregnant and left for 1-2 hours.	Iğdır	INWM000028
			The childless woman sits on the decoction prepared with the aerial parts of the plant.	Kars	
			The aerial parts of *Alkanna tinctoria, Malva neglecta* and *Alkanna orientalis* are boiled and a childless woman sits on hot water.	Iğdır	
Poaceae	*Hordeum vulgare* L.*	Arpa	The fruit stem of the plant is cooked and the honeycomb is added to it. This mixture is applied to the woman's vagina for infertility..	Ardahan	-
Poaceae	*Triticum aestivum* L.*	Buğday	After giving birth, women are fed a food called "hedik" made with wheat so that they have plenty of milk. Hedik is a food prepared by boiling wheat with water and salting it.	Iğdır	-
Polygonaceae	*Rumex crispus* L.	Evelik	If a glass of the infusion prepared with the leaves is drunk every morning until the disease ends, the uterus is cleaned.	Iğdır	INWM000029
Rosaceae	*Alchemilla pseudocarta linica* Juz.	Aslanpençesi (Göğebakan)	Tea, which is prepared as a decoction from the aerial parts of the plant, is consumed in uterine inflammation.	Kars	ATA/G-244
Rosaceae	*Rosa canina* L.	Şilan	The fruits of the plant are drunk after boiling in uterine inflammation.	Kars	INWM000038
Solanaceae	*Hyoscyamus niger* L.	Patpata, Patpat	The leaves of the plant are boiled with milk. In order to prevent infection in gynecological diseases, this mixture is applied externally to the genital area.	Ardahan	INWM000042
			The aerial parts of the plant are boiled and women without children sit on the steam.	Iğdır	
Solanaceae	*Solanum tuberosum* L.*	Patates	Lightly cooked potatoes are used externally in the fall of the umbilical cord.	Iğdır	-

* Cultivated plants

The most commonly used families in gynaecological diseases are Asteraceae (5- *Achillea millefolium* L., *Helichrysum arenarium* (L.) Moench, *H. plicatum* DC., *Tanacetum punctatum* (Desr.) Grierson, *T. vulgare* L.,), Malvaceae (5- *Alcea calvertii* (Boiss.) Boiss, *A. apterocarpa* Boiss., *A. striata* Alef., *A. hohenackeri* Boiss., *Malva neglecta* Wallr.) ve Lamiaceae (3- *Lavandula stoechas* L., *Mentha longifolia* (L.) L., *Teucrium polium* L.). The most commonly used herbs are *Alkanna tinctoria* (L.) Tausch, *Plantago major* L., *M. neglecta* and *Alcea striata* Alef.

4. DISCUSSION

As a result of the literature review, it was determined that most of the previous ethnobotanical studies in Ardahan, Iğdır and Kars regions covered the Eastern Anatolia. *Glycyrrhiza glabra* L., *T. polium*, *M. neglecta*, *Plantago lanceolata* L., *P. major* L., *Rumex crispus* L., *H. niger*, *M. longifolia*, which were determined to be used in Ardahan, Iğdır and Kars, were also included in our study. It has been determined that these plants are used for similar purposes [12-14]. In other ethnobotanical studies conducted in the Eastern Anatolia Region, *Amaranthus retroflex* L. [14, 15], *Mentha longifolia* (L.) Hudson subsp. *longifolia*, *Rumex patientia* L. [16], *Achillea biebersteinii* Afan., *A.*

coarctata Poir., *A. millefolium* L. subsp. *millefolium*, *A. wilhelmsii* C.Koch, *A. setacea* Waldst. & Kit., *Ajuga chamaepitys* (L.) Schreber subsp. *chia* (Schreber) Arcangeli var. *chia*, *Anchusa azurea* Miller, *Betula litwinowii* Doluch, *Cardamine uliginosa* Bieb., *Chenopodium album* L. subsp. *album* var. *album*, *C. murale* L., *Ferula caspica* Bieb., *Galium humifusum* Bieb., *G. tricornutum* Dandy, *Heracleum trachyloma* Fisch. & Mey., *Hypericum lydium* Boiss., *H. scabrum* L., *Juglans regia* L., *Plantago major* L. subsp. *intermedia* (Gilib.) Lange, *Rumex crispus* L., *Salvia hydrangea* DC. ex Bentham, *Scorzonera cana* (C. A. Meyer) var. *jacquiniana* (W. Koch) Chamberlain, *S. laciniata* L. subsp. *laciniata*, *S. suberosa* C.Koch subsp. *suberosa*, *S. tomentosa* L., *Tanacetum punctatum* (Desr.) Grierson, *Urtica dioica* L., *Verbascum cheiranthifolium* Boiss [14], *Cephalaria gigantea* (Ledeb.) Bobrov, *Marrubium catariifolium* Desr, *Tanecetum balsamita* L., *T. coccineum* (Willd.) Grierson subsp. *chamaemelifolium* (Somm. et Lev.) Grierson. [17] plants have been found to be used in gynecological diseases.

The medical folklore of the Eastern Anatolia Region is especially important because some settlements in this region are scattered and preserved. Many plants are known for their therapeutic properties in and around the provinces of Ardahan, Iğdır and Kars, and some of them are used in gynaecological diseases. Due to the limited industry and transportation facilities, most of the traditions that have been maintained in this region for many years have survived to the present day, and the plants that are among these traditions and have a therapeutic effect have taken their place in urban life as well as in the countryside. General information about these plants and their uses are presented in Table 2.

5. CONCLUSION

The fact that people increasingly prefer natural medicine is among the main reasons why plants gain even greater importance today. The study of folk medicine, which is a part of folk culture, contributes to a better analysis of the society in many ways and to the treatment methods developed by modern medicine. From the past to the present, the use of plants in gynecological diseases has been found in many sources. Although traditional medicine is widely practiced in the regions where it is studied, it is rapidly being replaced by modern medicine and pharmacy. In addition, traditional knowledge is rapidly disappearing due to the migration of people living in rural areas from villages to big cities, especially to Istanbul in recent years. This is particularly evident in the provinces of Ardahan and Kars. For this reason, despite the deep-rooted history in such provinces, the transfer and use of traditional knowledge has remained limited.

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The Declaration of Conflict of Interest/ Common Interest
The authors have declared no conflict of interest.

Authors' Contribution
Concept: S.K., Z.K., Ö.A., Y.Z.S., Ü.İ., A.P., Design: S.K., Z.K., Ö.A., Ü.İ., Data Collection or Processing: S.K., Z.K., Ö.A., Y.Z.S., Ü.İ., A.P., Analysis or Interpretation S.K., Z.K., Ö.A., Y.Z.S., Ü.İ., A.P., Literature

Search: S.K., Z.K., Ü.İ., Writing: S.K., Z.K., Ü.İ.

The Declaration of Ethics Committee Approval

This study was carried out within the scope of the project named "Biyolojik Çeşitliliğe Dayalı Geleneksel Bilginin Kayıt Altına Alınması". Field studies in the related project were carried out under the coordination of the relevant village headmen, with the assignment of the Ministry of Agriculture and Forestry and the knowledge of the governorships.

The Declaration of Research and Publication Ethics

The authors of the paper declare that they comply with the scientific, ethical and quotation rules of SAUJS in all processes of the paper and that they do not make any falsification on the data collected. In addition, they declare that Sakarya University Journal of Science and its editorial board have no responsibility for any ethical violations that may be encountered, and that this study has not been evaluated in any academic publication environment other than Sakarya University Journal of Science.

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