



## Ethnobotanical properties of natural plants in Kop Mountain Pass (Bayburt /Turkey)

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### Abstract

This study was carried out to determine some natural plant and the ethnobotanical properties of these plants and it was carried out in seven villages of the central district of Bayburt. As a result of the study, it was determined that 92 taxa belonging to 36 families have ethnobotanical characteristics with the information obtained from the informant people. The families, scientific names, usage purposes, and traditional usage forms of these plant taxa that have ethnobotanical importance have been explained. Of these plants that spread naturally and continue to be used; 18 taxa consumed as food, 12 taxa as food and medicinal, 25 taxa as medicinal, 2 taxa as fruit, 12 taxa as fruit and medicinal, 8 taxa used as aromatic (spice) and 7 taxa as aromatic and medicinal. Of these plants leaf (36 taxa), flower (24 taxa), fruit (15 taxa), seed (12 taxa), root (9 taxa), stem (8 taxa), above ground (6 taxa), branch (5 taxa), shoot (2 taxa), tuber (1 taxon), corm (1 taxon), bark (1 taxon) components were used. It has been recorded that 25 taxa used for other purposes broom (3 taxa), basket (1 taxa), toy (3 taxa), dye (2 taxa), decorative (6 taxa), firewood (10 taxa) have ethnobotanical uses. In the study area; *Rumex alpinus* L. and *Rumex crispus* L. of Polygonaceae family, *Rosa foetida* J.Herrm., *Rosa spinosissima* L., *Malus sylvestris* (L.) Mill. of the Rosaceae family, *Chenopodium album* L., and *Atriplex nitens* Schkuhr belonging to the family Amaranthaceae has been determined commonly used wild plants.

**Key words:** biodiversity, ethnobotany, genetic resources, natural plants, public health

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## Kop Geçidi doğal bitkilerinin etnobotanik özellikleri (Bayburt/Türkiye)

### Özet

Amacı halkın kullandığı ve yararlandığı bitkiler ve bu bitkilerle ilgili kullanım bilgilerini tespit etmek olan bu araştırma Bayburt merkez ilçeye bağlı yedi köyde gerçekleştirilmiştir. Yürütülen bu çalışmada kaynak kişilerden elde edilen bilgiler ile 36 familyaya ait 92 taksonun etnobotanik özelliklerinin olduğu belirlenmiştir. Bu taksonlardan etnobotanik öneme sahip olanlarının familyaları, bilimsel adları, kullanım amaçları ve geleneksel kullanım biçimleri belirtilmiştir. Doğal yayılış gösteren ve kullanımını sürdürülen bu bitkilerden; gıda olarak tüketilen 18 takson, gıda ve tıbbi olarak 12 takson, tıbbi bitki olarak 25 takson, aromatik bitki olarak 8 takson, aromatik ve tıbbi bitki olarak 7 takson, meyve olarak 2 takson, meyve ve tıbbi bitki olarak 12 taksonun kullanıldığı, kullanılan bitkilerin yaprak (36 takson), çiçek (24 takson), meyve (15 takson), tohum (12 takson), kök (9 takson), gövde (8 takson), toprak üstü (6 takson), dal (5 takson), sürgün (2 takson), yumru (1 takson), corm (1 takson) ve kabuk (1 takson) aksamından yararlanıldığı belirlenmiştir. Diğer amaçlarla kullanılan 25 taksonun yakacak (10 takson), dekoratif (6 takson), süpürge (3 takson), oyuncak (3 takson), boya (2 takson) ve sepet (1 takson) gibi etnobotanik kullanımlarının olduğu kaydedilmiştir. Çalışma alanında yaygın olarak kullanılan yabancı bitkilerin; Polygonaceae familyasına ait *Rumex*

*alpinus* L. ile *Rumex crispus* L., Rosaceae familyasına ait *Rosa foetida* J. Herrm., *Rosa spinosissima* L., *Malus sylvestris* Mill. ve Amaranthaceae familyasına ait *Chenopodium album* L. ile *Atriplex nitens* Schkuhr olduğu tespit edilmiştir.

**Anahtar kelimeler:** biyolojik çeşitlilik, doğal bitkiler, etnobotani, genetik kaynaklar, halk sağlığı

## 1. Introduction

Humans have been in contact with plants since their existence. The fact that people live side by side with plants in many areas of their lives is the best indicator of this communication. People living in the same geographical area with plants primarily use wild plants as food, medicine, fodder, decoration, dye, heat, and building material [1, 2]. Determining the use of plants in different areas reveals the extent of plant-human communication and interaction. Ethnobotany allows the research of plants that people are intertwined with and benefit from in various ways, the documentation of their data, and the use of their outputs in appropriate areas. Ethnobotanical research has gained momentum in recent years and has been done with different methods. Ethnobotanical research is of great importance in the scientific evaluation of all plant species that have a role in plant-human relations. The research provides material for future generations and different disciplines by recording valuable plant genetic resources and information from endemic informant persons. Studies on protecting biodiversity and genetic resources and ethnobotanical studies form an inseparable whole.

Turkey's rich flora is floristically and ethnobotanically significant. Turkey has a different position in terms of its phytogeographic structure, biological diversity, and the use of these areas. There are 12.000 plant species (9.500 genus and 11.599 species) in Turkey and 3.649 of these plants are endemic [3]. The richness of the country is more evident, especially in the transitional zones. One of the most important places in Turkey is the Kop Passage belt where the plants are widely used for various purposes. The settlements located in the transition zones come to the fore with their unique ecology, topography, geography, and flora. The Kop Mountain Passage reflects the geographical characteristics of both provinces (Bayburt-Erzurum) through which it passes. The vegetation of Bayburt province is similar to the vegetation of its neighbors Erzurum, Erzincan, and Gümüşhane. Similar ethnobotanical studies were carried out in the provinces close to the research area.

As a result of some ethnobotanic studies carried out in Erzurum, Erzincan and Gümüşhane, plants used for food, medicine and other purposes were identified [4, 5, 6]. Despite many studies in the ethnobotanical field in recent years, Bayburt is one of the provinces where ethnobotanical studies have not been carried out. This study aims to identify the plants that the local people benefit from and use for different purposes and to determine the ways these plants are used.

### 1.1. Research area

Kop Mountain Pass, which is among Turkey's passes of 2.000 meters and above, has an altitude of 2.409 meters. It is located on the Erzurum plain with the borders of Bayburt, which is at the crossing of the Eastern Anatolia Region and the Black Sea Region. Bayburt province is located northeast of the Kop Passage (Figure 1). Bayburt is one of the smallest city (as area and population) in Turkey. It is located Çoruh valley, just South of Eastern Black Sea mountain range.

A very small part of Bayburt, approximately 3%, is forested and the forests are concentrated in small groups in mountainous areas. The natural vegetation of Kop Mountain is steppe formation. This native vegetation is covered with occasional *Astragalus globosus* Vahl. groups and occasional fertile meadows suitable for pasture livestock in large areas [7, 8]. Bayburt province was chosen as the research area because of its rich flora and the fact that the local people set up settlements on the skirts or slopes of Kop Mountain, which gives them the possibility of benefiting from this flora. In addition, the fact that no comprehensive ethnobotanical study has been conducted in this area before was another factor in the choice of the research area.

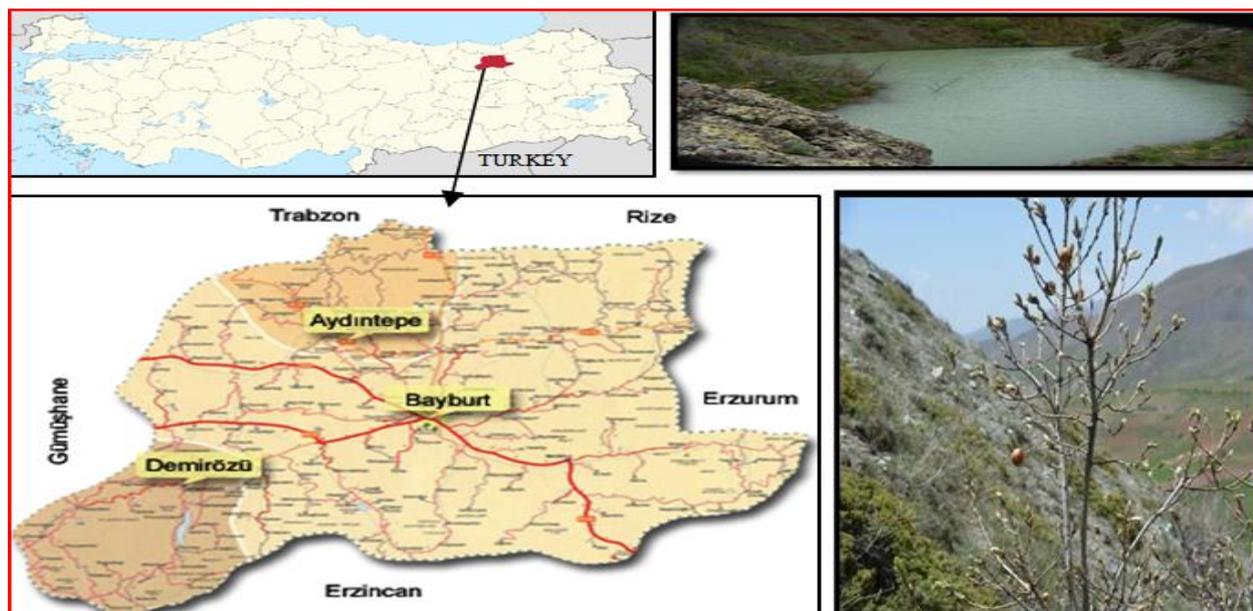


Figure 1. Geographical location of the research area

## 2. Materials and methods

Seven villages in the central district of Bayburt constitute the research area. Research material is composed of plants with ethnobotanical characteristics from the villages of Aşağı/Yukarı Kopköy, Örence Akduran, Başçımagil, Çalidere, Sığırçı, and Demirkaş in the central district of Bayburt. These villages are located on the extension of the Kop Mountain along borders Erzurum of the province of Bayburt.

In the research carried out between 2012 and 2015 data were collected by following the plants every month between March and November. The snowball sampling method was used in data collection [9] This technique focuses on people from whom rich data can be obtained and provides access to the universe by following this person. The informants were selected from people who are known to have knowledge and experience on the subject and who are known for these characteristics in the region. The study was initiated with informant one, who referred to other possible informants. These people were reached and interviewed. The interviews were held in the village square and the houses since most of the source persons were women, who were staying at home. During the research, a total of 106 different informants were interviewed. The questions were regarding the demographics and the purpose as well as the means of the plants used. In addition, herbarium specimens were collected at regular intervals with the participants (however not all of the informants, who provided the information about the plants, were able to participate in the collection of the plants).

These specimens were pressed and dried according to the herbarium technique. The study titled *Flora of Turkey and the East Aegean Islands* was primarily used in the identification of plants [10] and technical support was obtained from Atatürk University Faculty of Agriculture, Department of Field Crops and Plant Protection and Karabuk University, Faculty of Forestry, Department of Forestry Botany. Seed samples collected following the technique were sent to Turkey Seed Gene Bank (Ankara) and National Seed Gene Bank (Menemen/İzmir). Herbarium specimens are kept in the herbarium of the Eastern Anatolia Agricultural Research Institute. Plants used by local people are classified under four headings: food and medicinal, only medicinal, aroma and medicinal uses, and other uses. Plants are given with the families, local names, purpose of use, type of use, and the numbers of users are given (Table 1, 2, 3, and 4). In Table 5, the results of the research were compared and evaluated with the results of similar ethnobotanical researches conducted in the neighboring provinces.

## 3. Results

The targeted villages were visited between March and November each year. The surveys were conducted with 106 people. The results showed that 60.4% of the interviewees were women. 53% of women and 64% of men were primary school graduates. Information on traditional use was usually obtained from men and women over the age of 55 (Figure 2).

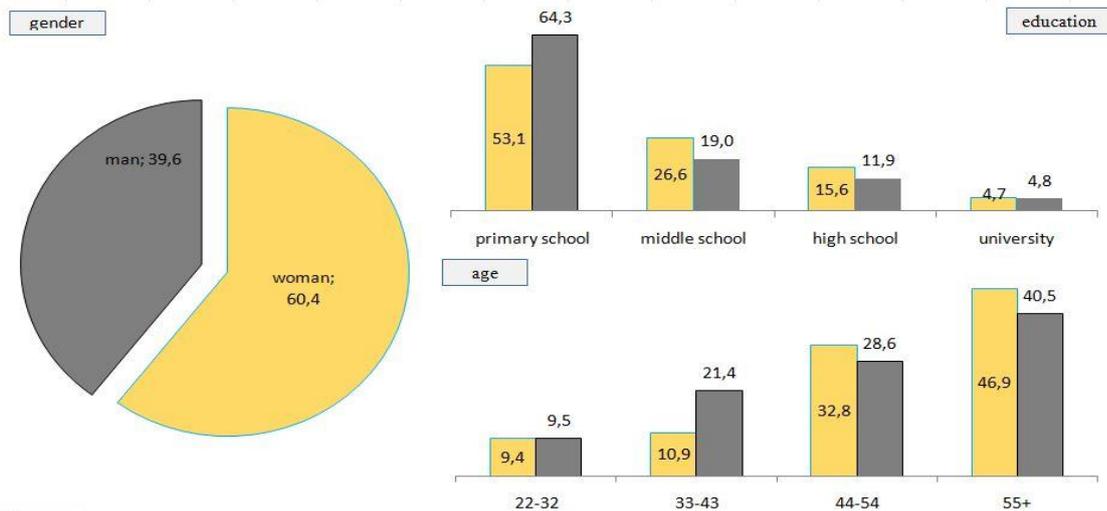


Figure 2. Demographic characteristics of informant people

According to the results of the research, the use of 92 taxa belonging to 36 families for food, medicinal and others purposes was determined. Families with the most taxa are Asteraceae (11) Apiaceae (10), Rosaceae (9), and Lamiaceae (8) (Figure 3). In addition, as a result of the observation of the natural distribution areas of the plants, it was observed that *Thymus*, *Origanum*, *Astragalus*, *Allium*, *Hypericum*, *Ranunculus*, *Thymbra*, *Mentha*, *Ferula*, *Rumex*, *Rosa*, *Crataegus*, *Verbascum*, *Vicia*, *Helichrysum*, *Zosima* species were found to be concentrated in the research area.

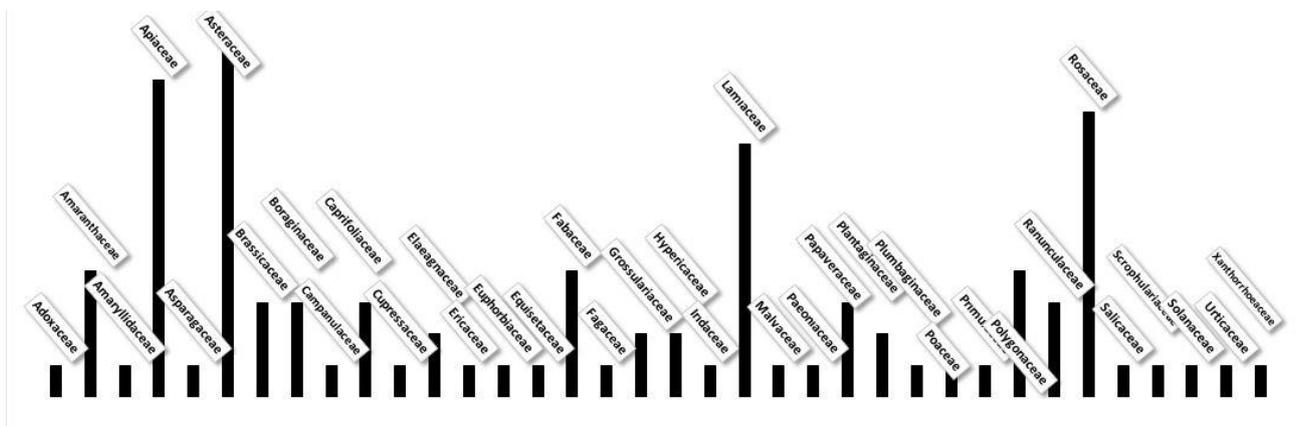


Figure 3. Families of taxa

44 taxa belonging to 21 families are used as food (vegetable and fruit) and medicinal purposes (Table 1).

Table 1. Used taxa for food and medicinal purposes

Family name	Scientific name	Local name	Used parts	Usage forms and number of users
Adoxaceae	<i>Viburnum lantana</i> L.	Gemişo, ayı üzümü, yemişek	fruit	fruit consumption kidney stones (tea-decoction) 8
Amaranthaceae	<i>Beta corolliflora</i> Zosimovic ex Buttler	Has pancar	leaves seed	consumed cooked 55 goiter and shortness of breath 25
	<i>Beta lomatozona</i> Fisch. & C.A.Mey.	Yabani pancar	leaves	consumed cooked 35
	<i>Chenopodium album</i> L.	Tel pancarı, kül pancarı	leaves	consumed cooked 70
	<i>Atriplex nitens</i> Schkuhr	Tel pancarı	leaves	consumed cooked 75
Apiaceae	<i>Echinops pungens</i> var. <i>pungens</i> Trautv.	Topuz diken	flower	the soft part inside is eaten 25
	<i>Zosima absinthifolia</i> (Vent.) Link	Pancar	above ground	consumed cooked 38 herby cheese 5

Table 1. (Continues)

Family name	Scientific name	Local name	Used parts	Usage forms and number of users
Apiaceae	<i>Ferula orientalis</i> L.	Çaşır, çaşur	stem leaves	consumed by cooked 58 herby cheese 10 diabetes (fresh or pickled) 25
	<i>Malabaila dasyantha</i> (K.Koch) Grossh.	Kelemen keşir	stem	eaten fresh 10
	<i>Heracleum pastinacifolium</i> subsp. <i>incanum</i> (Boiss. & A.Huet) P.H.Davis (endemic)	Çaşur, baldırgan	stem	eaten fresh 15 herby cheese 6
	<i>Eryngium billardierei</i> F.Delaroche	Şeker tikani	stem	eaten fresh 28
Asteraceae	<i>Tragopogon aureus</i> Boiss. (endemic)	Yemlik	leaves	consumed cooked 63 eaten fresh an empty stomach stomach pain 32
	<i>Opopanax hispidus</i> (Friv.) Griseb.	Keküre, kekire	stem	eaten fresh 21
Brassicaceae	<i>Capsella bursa-pastoris</i> (L.) Medik.	Kuşgözü	leaves	consumed cooked 45
Boraginaceae	<i>Cerintho minor</i> L. subsp. <i>auriculata</i> (Ten.) Domac	Hişhiş	leaves	consumed cooked 26
			branch	in the gum and palate wounds (mouthwash) 15
Caprifoliaceae	<i>Cephalaria syriaca</i> (L.) Schrad.	Orum	seed	to prevent the bread from sticking to the tandoor 21
Ericaceae	<i>Vaccinium uliginosum</i> L.	Yemişen	fruit	fruit consumption 18 for inflammation and remove kidney stones (tea -decoction) 7
Elaeagnaceae	<i>Elaeagnus angustifolia</i> L.	Yabani iğde	fruit	fruit consumption 21 for bronchitis (fruits are boiled with milk ) 13
	<i>Elaeagnus rhamnoides</i> (L.) A.Nelson	Sincan	fruit flower branch	fruit consumption 13 for stomach pain and mouth sores (tea-decoction) 5
Fabaceae	<i>Lathyrus tuberosus</i> L.	Koşgoz, goşgoz	tuber	eaten fresh 18
	<i>Trifolium repens</i> L.	Dut, tut	flower	eaten fresh 20
	<i>Vicia canescens</i> subsp. <i>variegata</i> (Willd.) P.H.Davis	Yabani bezelye, külür	seed	eaten fresh or cooked 53
Grossulariaceae	<i>Ribes orientale</i> Desf.	Horhoç, büküzümü	fruit	fruit consumption 31 appetizer, blood maker 12
	<i>Ribes petraeum</i> Wulfen	Horhoç, büküzümü	fruit	fruit consumption 30 appetizer, blood maker 15
Iridaceae	<i>Crocus kotschyanus</i> subsp. <i>kotschyanus</i> K.Koch	Çiğdem	corm	corms are eaten fresh or cooked 18 in ash (dried and ground corms thickener in dairy products) 8
Lamiaceae	<i>Lamium amplexicaule</i> L.	Emzik	flower	Honey essence in the flower is absorbed. 11
Malvaceae	<i>Malva neglecta</i> Wallr.	Gagala ot/ ebem kemesi	leaves	consumed cooked 36
			flower root	abdominal bloating (boiled plant compress) 11
Papaveraceae	<i>Papaver dubium</i> L.	Haşhaş	flower seed (capsule)	It is added to some foods to color the flower and seed parts. In addition, the part in the middle of the flower is eaten for pleasure. 31 25

Table 1. (Continues)

Family name	Scientific name	Local name	Used parts	Usage forms and number of users
Plantaginaceae	<i>Plantago major</i> L.	Bağa yarpağı Boğaotu	leaves	consumed (stuffed) 28 Cleaning and healing wounds (boiled plant plain or olive oil is poured on the uncomfortable area and attached to the inflamed wound)
			seed	52 For hemorrhoids the seeds are ground and mixed with honey and eaten a spoon each morning. 23
Polygonaceae	<i>Polygonum cognatum</i> Meissn.	Ebemekmeği, kuşeymeği	above ground	consumed raw or cooked 48
	<i>Rheum ribes</i> L.	Işgın, eşği	stem	diabetes, hemorrhoids (eaten fresh) 50
	<i>Rumex alpinus</i> L.	Evelik	leaves	consumed cooked 98
			seed	kidney stones, bronchitis, hemorrhoids (tea-decoction) 31
<i>Rumex crispus</i> L.	Evelik, evelük	leaves seed	consumed cooked 85 kidney stones, bronchitis, hemorrhoids (tea-decoction) 58	
Ranunculaceae	<i>Caltha palustris</i> L.	At ayağı, lulipar	leaves	Young leaves are stuffed. 18 rheumatism (boiled leaves compress) 8
Rosaceae	<i>Cerasus angustifolia</i> var. <i>sintenisii</i> (C.K.Schneid.) Browicz	Yabani kiraz	fruit	fruit consumption 25 diuretic and diaphoretic 16
	<i>Rubus caesius</i> L.	Böğürtlen, mor mor	fruit	fruit consumption 28
	<i>Crataegus orientalis</i> var. <i>orientalis</i> Pallas ex Bieb.	Aloş, aloç	fruit leaves/ branch root	fruit consumption 25 shortness of breath and haemorrhoids (tea-decoction) 16 rheumatism pains (compress)
	<i>Cotoneaster integerrimus</i> L.	Mecük, koyungözü	fruit bark/root	inflammation 9 hemorrhoids (tea-decoction) 11
	<i>Malus sylvestris</i> (L.) Mill.	Yabani elma, eşki alma	fruit	for appetizing and 67 bloodforming 21 diabetes (cooked fruit and juice)
	<i>Pyrus syriaca</i> Boiss.	Yabani armut	fruit	fruit consumption 41 for abdominal pain, diarrhea, intestinal worms (cooked fruit) 28
	<i>Rosa foetida</i> J.Herm.	Kuşburni	fruit root	marmalade, syrup 92 for colds, hemorrhoids (tea-decoction).
	<i>Rosa spinosissima</i> L.	Karaguşburni	fruit root	marmalade, syrup 82 for hemorrhoids (tea-decoction) 95
Urticaceae	<i>Urtica dioica</i> L.	Isırgan	leaves	consumed cooked 45 arm, leg pain rheumatism 50
			seed	cancer (honey and seed) 32
Xanthorrhoeaceae	<i>Eremurus spectabilis</i> M.Bieb.	Çiriş, yabani pırasa, cırcır	above ground	consumed cooked 52 (It is believed to cure all kinds of diseases.)

18 taxa were identified for foodstuff, 12 taxa for foodstuff and medicinal, 25 taxa for medicinal, 2 taxa for fruit and 12 taxa for fruit and medicinal purposes, 8 taxa for aromatic, and 7 taxa for both aromatic and medicinal purposes. It has been determined that the food plant is consumed either cooked or raw (Figure 4a).

In addition, some plants were used for decoration (6 taxa), as a dye (2 taxa), basket making (1 taxon), broom making (3 taxa), toys (3 taxa), and fuel (10 taxa) (Figure 4b). It was observed and recorded that many parts of the plants such as leaves, flowers, and fruits were used for food and medicinal purposes that they were used intensively.

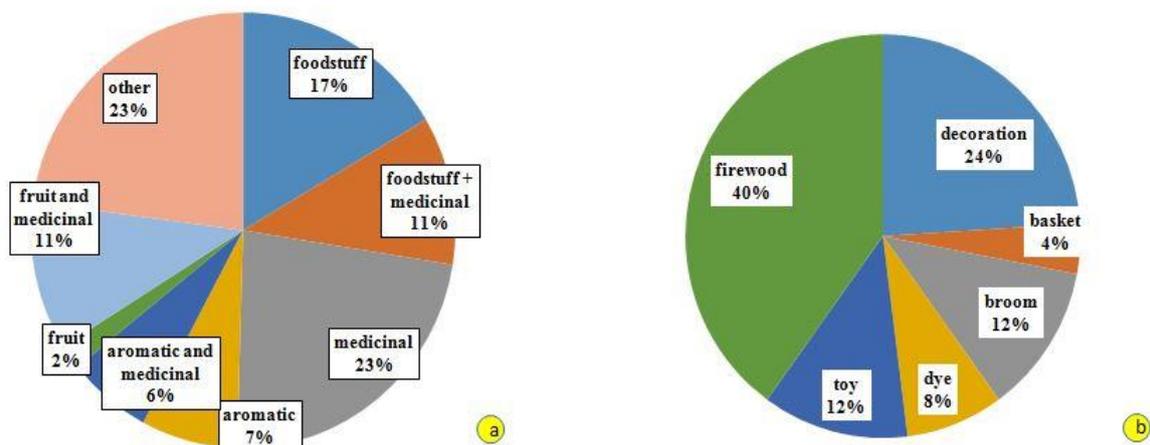


Figure 4. Usage purposes of taxa

The parts of the plants used respectively are leaves (36 taxa), flower (24 taxa), fruit (15 taxa), seed (12 taxa), root (9 taxa), stem (8 taxa), above ground (6 taxa), branch (5 taxa), tuber (1 taxa), corm (1 taxa) and bark (1 taxa) (Figure 5a). 57 taxa; hemorrhoids (15 taxa), stomach ache (6 taxa), shortness of breath/bronchitis (5 taxa), rheumatism (5 taxa), asthma (4 taxa), kidney stone (4 taxa), intestinal ailments (4 taxa), and other illness (14 taxa) for are used medicinal purpose (Figure 5b).

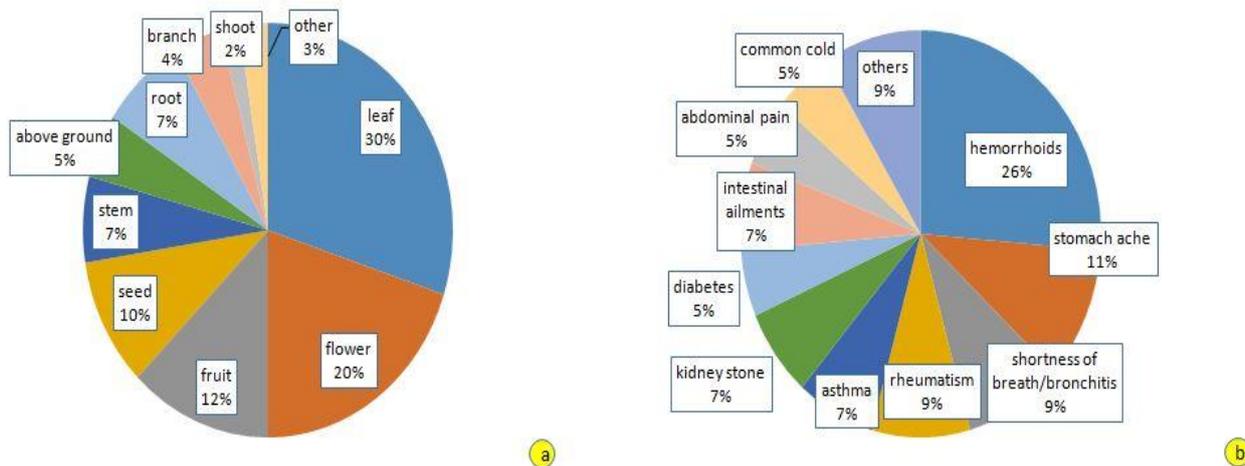


Figure 5. Used parts and diseases

25 taxa belonging to 18 families are used as medicinal plants for health purposes in the treatment of different diseases (Table 2). Plants known locally as sütlaç, kız kılıcı, çemlik, yılan yemliği could not be reached since the informant people could not participate in the field studies due to their old age. It has been declared that sütlaç is used for palate wounds, kız kılıcı for stopping bleeding, çemlik and yılan yemliği for stomach pain relief, and adamotu for infertility.

The seven taxa recorded in the study; *Anthemis cretica* subsp. *argaea* (Boiss. & Balansa) Grierson, *Tragopogon aureus* Boiss., *Muscari coeleste* Fomin, *Onosma bornmuelleri* Hausskn. & Bornm., *Origanum acutidens* (Hand.-Mazz.) Ietsw., *Heracleum pastinacifolium* subsp. *incanum* (Boiss. & A.Huet) P.H.Davis, *Acantholimon kotschyi* (Jaub. & Spach) Boiss. were determined to be endemic species [11].

Table 2. Used taxa for medicinal purposes

Family name	Scientific name	Local name	Used parts	Usage forms and number of users
Asparagaceae	<i>Muscari coeleste</i> Fomin (endemic)	Kurtsoğanı	leaves	wounds, warts (raw leaves) 38
Asteraceae	<i>Achillea arabica</i> Kotschy	Kılıçotu, civanperçemi	flower	to stop bleeding, weaken and 23 hemorrhoids
	<i>Anthemis cretica</i> subsp. <i>argaea</i> (Boiss. & Balansa) Grierson (endemic)	Papatya	flower	colds and relief (boiled and drunk 40 as tea (tea-decoction))
	<i>Centaurea iberica</i> Trev. ex Spreng.	Çakırtikani	flower leaves	bath for eye and skin ailments (tea- 18 decoction)
	<i>Helichrysum plicatum</i> subsp. <i>plicatum</i> DC.	Sarıçiçek, ölmez çiçek	flower	kidney ailments, stomach ailments, 35 calcification (tea-infusion)
	<i>Xeranthemum annuum</i> L.	Hanım süpürgesi	flower	The flowers are heated on the sheet, 2 when the ash is healed, it is applied to the wounds on the face, after a few hours, they are wiped.
Boraginaceae	<i>Echium italicum</i> L.	Engerekotu/ pişikguyruğu	leaves	diuretic (tea-infusion) 9
	<i>Onosma bornmuelleri</i> Hausskn. & Bornm. (endemic)	Emzik otu	seed flower	wounds and burns 15 Unsalted fresh butter or pure olive oil is mixed with the powder obtained by pounding from the root, it is turned into an ointment and applied by rubbing.
Caprifoliaceae	<i>Cephalaria transylvanica</i> (L.) Roem. & Schult.	Gevrek/ düllük	stem (latex)	wounds or cuts 12
Cupressaceae	<i>Juniperus excelsa</i> M.Bieb.	Çeçem/ kekem gagası	fruit root	asthma (breathing), hemorrhoids 12 (tea-decoction) for eczema 8 (externally)
Euphorbiaceae	<i>Euphorbia esula</i> subsp. <i>tommasiniana</i> (Bertol.) Kuzmanov	Sütlegen	Stem (latex)	bleeding is stopped 5
Equisetaceae	<i>Equisetum ramosissimum</i> Desf.	Atkuyruğu kırk kilit otu	leaves	infertility, asthma, bronchitis (tea- 11 decoction)
Hypericaceae	<i>Hypericum perforatum</i> L.	Kantaron	leaves flower	hemorrhoids (cotton compress) 35 The oil obtained after keeping it in pure olive oil for 40 days is applied to the painful parts.
	<i>Hypericum scabrum</i> L.	Kantaronotu		48
Lamiaceae	<i>Lamium orientale</i> (Fisch. & C.A.Mey.) E.H.L.Krause	Patpat	flower	diarrhea (tea-infusion) 6
Paeoniaceae	<i>Paeonia arietina</i> G.Anderson	Ayı gülü	above ground	cancer, shortness of breath, asthma 12 (tea-decoction)
Papaveraceae	<i>Fumaria officinalis</i> L.	Şahtere	seed	For infertility, the seeds are mixed 31 with honey and a tablespoon is eaten in the morning on an empty stomach for a month.
Plantaginaceae	<i>Globularia trichosantha</i> subsp. <i>trichosantha</i> Fisch. & C.A.Mey.	Mayasıl otu	leaves	hemorrhoids (externally) 9
			root/above ground	tea-decoction 9
Primulaceae	<i>Primula algida</i> Adams	Tutya	flower	expectorant, soothing (tea-infusion) 7
Ranunculaceae	<i>Ranunculus repens</i> L.	Mayıs çiçeği	flower	rheumatism (externally) 14
	<i>Ranunculus kotschy</i> Boiss.	Basur otu	root	hemorrhoids 5 (tea-(decoction))
Rosaceae	<i>Alchemilla pseudocartalinica</i> Juz.	Aslanpençesi	leaves	menstrual cramps (tea-infusion) 13
Salicaceae	<i>Salix fragilis</i> L.	Söğüt	shoot	rheumatism (cooked shoots 17 compress)
Scrophulariaceae	<i>Verbascum phoeniceum</i> L.	Sığır guyruğu	flower	hemorrhoids (externally) 18
Solanaceae	<i>Hyoscyamus niger</i> L.	Delibatbat	seed	During the roasting of the seeds on 9 the fire, the worms in the eyes and ears are removed by making a steam bath.

15 taxa belonging to 5 families are used as aromatic and medicinal plants. 8 taxa used as aromatic (spice) and 7 taxa as aromatic and medicinal (Table 3).

Table 3. Taxa used as aromatic or medicinal plants

Family name	Scientific name	Local name	Used parts	Usage forms and number of users
Amaryllidaceae	<i>Allium scorodoprasum</i> L.	Yabani sarımsak/ Körmen	leaves	spice 21
				herby cheese 15
Apiaceae	<i>Petroselinum crispum</i> (Mill.) A.W.Hill (cultivated)	Mağdanoz	leaves	spice 28
			branch	
	<i>Carum meifolium</i> (M.Bieb.) Boiss.	Anıh	leaves	spice, for stomach indigestion (tea-decoction) 9
			seed	
	<i>Coriandrum sativum</i> L. (cultivated)	Aşoti	leaves	spice 43
			branch	
<i>Ferula orientalis</i> L.	Çaşır, çaşur	shoot	spice 18	
<i>Zosima absinthifolia</i> (Vent.) Link	Dağnenesi, karaanıh	leaves	spice 33	
		flower		
<i>Pimpinella nudicaulis</i> Trautv.	Ezerte/ezertei	seed	spice 31	
Asteraceae	<i>Artemisia dranunculus</i> Ledeb. (cultivated)	Darhun	leaves	spice 51
Brassicaceae	<i>Lepidium perfoliatum</i> L.	Tere	above ground	for breakfast (fresh) 36
			ground	intestinal disorders (eaten fresh) 6
Lamiaceae	<i>Ocimum basilicum</i> L. (cultivated)	Reyhan	leaves	spice 31
			flowers	
	<i>Thymus fallax</i> Fisch. & C.A.Mey.	Kara anık	leaves	spice 43
			flowers	
	<i>Origanum acutidens</i> (Hand.-Mazz.) Ietsw. (endemic)	Koç anığı	leaves	spice 46
			flowers	
			abdominal pain (tea- infusion) 21	
<i>Nepeta racemosa</i> Lam.	Yabani nane/ pisiknanesi	leaves	flu (tea-infusion) 16	
		flowers		
<i>Mentha longifolia</i> (L.)	Yaban nenesi	leaves	stomach ailments, respiratory	
		flowers	tract breathing (tea-infusion) 36	
<i>Ziziphora clinopodioides</i> Lam.	Annuh, reyhan	leaves	herby cheese 6	
		flowers		insomnia, diabetes, stomach and digestive ailments (tea-infusion) 15

25 taxa used for other purposes (broom (3 taxa), basket (1 taxa), toy (3taxa), dye (2 taxa), decorative (6 taxa), firewood (10 taxa) have ethnobotanical uses (Table 4).

Table 4. Some taxons used for different purposes

Family name	Scientific name	Local name	Usage forms and number of users
Asteraceae	<i>Cota tinctoria</i> var. <i>tinctoria</i> (L.) J.Gay	Papatya	Decorative / Dye 45/21
	<i>Helichrysum arenarium</i> (L.) Moench	Sarıçiçek	Decorative 52
	<i>Xeranthemum annuum</i> L.	Hanım süpürgesi	Broom 16
Brassicaceae	<i>Descurainia sophia</i> (L.) Webb ex Prantl	Süpürge	Broom 41
Campanulaceae	<i>Asyneuma amplexicaule</i> (Willd.) Hand.-Mazz.	Çiçek	Decorative 18
Fagaceae	<i>Quercus petraea</i> (Matt.) Liebl.	Meşe/Kocaluk	Basket /Toys 3
Lamiaceae	<i>Lamium orientale</i> (Fisch. & C.A.Mey.) E.H.L.Krause	Patpat	Toys/decorative 13
Plumbaginaceae	<i>Acantholimon kotschy</i> (Jaub. & Spach) Boiss. (endemic)	Pisik geveni	Decorative 9
Ranunculaceae	<i>Pulsatilla violacea</i> subsp. <i>armena</i> (Boiss.) Luferov	Lale	Decorative 7
Papaveraceae	<i>Papaver dubium</i> L.	Haşhaş/ gelüncük	Dye /Toys 11
Asteraceae	<i>Achillea millefolium</i> subsp. <i>millefolium</i> L.		3

Table 4. (Continue)

Family name	Scientific name	Local name	Usage forms and number of users
Poaceae	<i>Stipa capillata</i> L.	Sümbül	Decorative 19
Salicaceae	<i>Salix fragilis</i> L.	Söğüt	Barn broom 37
Fabaceae	<i>Astragalus eriocephalus</i> Willd.	Gırç	Firewood
Scrophulariaceae	<i>Verbascum phoeniceum</i> L.		
Trees and shrubs given in other tables ( <i>Quercus</i> , <i>Salix</i> , <i>Juniperus</i> , <i>Malus</i> , <i>Prunus</i> , <i>Pyrus</i> , <i>Rosa</i> , <i>Crateagus</i> etc. trees and shrubs.			

#### 4. Conclusions and discussion

In the study, 60% of the people from whom ethnobotanical information was obtained were women. This may be because women show more interest in using local and traditional herbs. In addition, it is thought that the fact that the researchers who conducted the interviews were also women was effective. *Thymus*, *Origanum*, *Astragalus*, *Allium*, *Hypericum*, *Ranunculus*, *Thymbra*, *Mentha*, *Ferula*, *Rumex*, *Rosa*, *Crataegus*, *Verbascum*, *Vicia*, *Helichrysum*, and *Zosima* species were found to be intense as a result of observation of the natural spreading areas of the plants in the study area. Kop Mountain is covered with steppes and forests are in small particles. The vegetation is mostly made up of shrubs, but there are also alpine meadows at higher elevations. As a result, although most meadow pasture plants are visible, plants like *Juniperus*, *Astragalus*, *Brom*, *Festuca*, *Thymus*, *Rumex*, *Verbascum*, and *Ferula* are widespread [12]. Again, in a study *Glaucium* sp., *Echium vulgare*, *Caltha palustris*, *Primula auriculata*, *Primula elatior*, *Muscari neglectum*, *Prunus* sp. around Karasu River, *Juniperus* sp., *Pyrus* sp. plants were recorded [8].

According to the results of the research, 81 genera and 92 species from 36 families were used as food for nutritional purposes, medicinally for public health, and a variety of other purposes. The families with the most species can be listed as Asteraceae (11 taxa), Apiaceae (10 taxa), Rosaceae (9 taxa), Lamiaceae (8 taxa), Amaranthaceae (4 taxa), and Polygonaceae (4 taxa). According to many studies, these families are represented by many species in our country's flora [13, 14, 15]. There are similarities and variations with several studies conducted in various regions of Turkey. This is because traditional uses are different due to different cultures. Similar results were obtained in some ethnobotanical studies carried out in places close to the study area (Erzurum, Erzincan, and Gümüşhane). In these studies, it is seen that taxa are primarily used as food and there is a remarkable density in taxa used for medical purposes. In addition, the use of the same taxa for different purposes shows the richness of the studied flora and cultural diversity (Table 5). This shows that plants have a wide distribution in the region and are widely used among the people. The widespread use of plants among the people expresses the loyalty to the traditions.

Table 5. Ethnobotanical researches carried out near the research area

References	Date	Research Area	Findings
[16]	2000	Erzurum (İlica)	52 plant species are used by the public for therapeutic purposes.
[17]	2004	Erzurum (İlica)	65 plant species are used for different purposes.
[1]	2005	Erzurum (Narman)	52 plant species belonging to 28 families are used for therapeutic purposes.
[18]	2006	Erzurum	72 species belonging to 20 families have been identified, and most of the species used for food purposes belong to Lamiaceae, Rosaceae, Apiaceae and Asteraceae families.
[19]	2012	Erzurum	There are 70 medicinal plants belonging to 29 families.
[20]	2012-2013	Erzurum	It was determined that 26 of 59 taxa were used for food, 19 for food and medicine, 5 for only medical and 9 taxa were used for different purposes.
[21]	2011	Erzincan (Üzümlü)	It was determined that 140 species belonging to 44 families and 60 taxa were used for food purposes.
[5]	2011-2013	Erzurum -Erzincan	It was determined that 182 plant species belonging to 37 families were used as vegetables.
[22]	2013	Erzincan (Kemaliye)	37 taxa belonging to 20 families were used as food.
[23]	2014	Erzincan (Ergan Mountain)	It was determined that a total of 122 taxa belonging to 41 families were used for different purposes.
[6]	2002	Gümüşhane (Köse Mountains)	It was found that taxa belonging to 195 species and subspecies categories were used for medicinal purposes.
[24]	2013-2014	Gümüşhane (Kelkit)	It has been determined that 85 taxa belonging to 30 families are used as food.

It has been noted that although the species' leaves and flower parts are the most commonly used, other parts such as fruits, roots, stems, tubers, and branches are also used, and the plants are often collected in the spring and autumn. In the study area; *Rumex alpinus* L. and *Rumex crispus* L., *Rosa foetida* J. Herrm., *Rosa spinosissima* L., *Malus sylvestris* Mill., and *Chenopodium album* L. and *Atriplex nitens* Schkuhr has been determined commonly used wild plants. While some species such as *Tragopogon*, *Lamium*, *Trifolium*, *Lathyrus*, *Papaver*, *Rheum* and *Crocus* are consumed raw (fresh), generally large and leafy species such as *Beta*, *Rumex*, *Tragopogon*, *Urtica*, *Eremurus*, *Chenopodium*, *Ferula*, *Zosima*, and *Cerinte* are consumed by cooking. Plants used as vegetables are cooked with onion, bulgur, rice, or wheat. It is consumed with garlic yogurt. Especially evelik (*Rumex*) and tel pancarı (*Chenopodium*, *Atriplex*) are used as fresh and dried (black beet). It was also noted that some herbs were used as a pastry mixture and salads or that *Tragopogon*, *Polygonum*, *Rumex*, etc. were dipped in salt and eaten as a snack. According to other researches [18, 25] with similar results to the studies conducted, it was stated that wild plants were used as foodstuffs in the form of vegetables and fruits. Plants such as *Allium*, *Heracleum*, *Ferula*, *Zosima*, and *Ziziphora* are used for vegetable and flavoring purposes, as well as in the manufacture of herby cheese. In a study it has been reported that species such as *Ferula*, *Allium*, *Chaerophyllum*, *Heracleum*, *Thymus*, *Prangos*, and *Ziziphora* are used in herby cheese production [26].

Plants with fruits (*Cerasus*, *Malus*, *Prunus*, *Pyrus*, *Rosa*, *Rubus*, *Ribes*, *Vaccinium*, *Viburnum*, *Crataegus*, and *Elaeagnus*) are consumed as a fruit, as well as being transformed into products such as syrup, marmalade, and jam. Rosehip (kuşburnu) in particular is widely used. In addition to making its dessert called "kokoç", it is also sold in the form of a round wheel for use. It is also used in the treatment of some ailments (bronchitis, shortness of breath, intestinal disorders, hemorrhoids, etc.). Furthermore, drying branches or drying bushes are used as fuel. In other ethnobotanical studies, it was stated that trees and shrubs that bear fruit were used in similar ways [27, 28].

It has been reported that plants used for medicinal purposes are mostly used for hemorrhoids (15 taxa), stomach pain (6 taxa) shortness of breath (5 taxa) rheumatism (5 taxa), asthma (4 taxa), diabetes (3 taxa), and other illnesses. The outcomes represent the general situation; many studies have noted that hemorrhoids are the most common and disturbing disease [4, 29, 30, 31]. The continued use of medicinal plants even today in the treatment of diseases can be attributed to the richness of natural flora or the maintenance of traditions. The majority of uses are in the form of "tea" and generally teas are prepared decoction (cold water poured over the crumbled plant parts, heated by stirring frequently over low heat, filtered while hot) or as an infusion (boiling water is poured over the crushed plant parts and left for about 15 minutes, infused and filtered). It is also stated that there are uses such as oil, porridge, and ointment. Findings are similar to other sources [32].

In the research, 15 herbs were used for aromatic and medicinal purposes; 8 of these plants (*Allium*, *Petroselinum*, *Coriandrum*, *Ferula*, *Zosima*, *Pimpinella*, *Artemisia*, *Ocimum*) are aromatic plants used to flavor soups and meals, while 7 plants (*Carum*, *Lepidium*, *Thymus*, *Origanum*, *Nepeta*, *Mentha*, *Ziziphora*) are both aromatic and medicinal. It has been stated that these herbs are used to add flavor to meals, whether wet or dry, and their medicinal use is generally tea. Fragrant plants are generally stored by drying or freezing and are used as a spice during the winter months. Tea (infusion) made from the leaves or flowers of these plants (*Mentha*, *Origanum*, *Thymus*, *Nepeta*, and *Ziziphora*) are consumed as a hot drink. The use of aromatic wild plants, often from the Lamiaceae family, as fragrance and flavoring is common in cities as well as in the mountain villages of Western and Southern Anatolia [33]. Some plants are used as decoration, dye (hair), transportation, and cleaning materials by humans, while many trees and shrubs are used as winter wood, and timber is often used as a building material. Trees such as juniper, oak, and willow are used as fuel, as well as their fruits, cocoons, and stems for various purposes. Baskets made from branches of willow and beech tree branches are still made by a few people. The production of mold and broom (sakağıl, sakağo) used in the stables is also continuing. [8], in their study around the Karasu River, *Prunus* sp., *Juniperus* sp., *Pyrus* sp., *Populus*, and *Quercus* sp., exist and these trees were used for different purposes.

As a result, it has been determined that local cultures are represented in the study area. When the deep-rooted past of Bayburt and its surroundings is considered, it has been determined that in both nutrition, folk medicine, and other fields, human communication with plants has a rich history and is still being tried to be maintained. The ethnobotany studies in biodiversity-rich areas such as Bayburt should continue. Obtaining data from similar studies in similar regions can contribute to the economies of the regions and the country. Ethnobotanical studies are important as they contribute to the protection of cultural heritage and also reveal the importance of plants. With this study; we think we will contribute to this purpose.

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