Chapter

Ethnobotanical Uses of Roots of Various Plant Species in Turkey

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Abstract

Turkey has advantage of lying on transection of three climatic zones. Namely Europe-Siberia, Iran- Turan and the Mediterranean region situated between 26 and 45° east longitude and 36–42° north latitude in the Northern hemisphere. The number of plant species subspecies, taxa and varieties in Flora of Turkey is above 12,000. In terms of plant diversity in the temperate zone, it attracts attention with its features that are different from the neighbouring countries around it in Asia, Europe and the Middle East. This has led to the development of many distinct ethno-medicinal-botanical habits among local people; who use different plant parts like roots, leaves, flowers, fruits, herbs, seeds, etc. in their cuisines, natural dyeing, decoration, textile dyeing and medicinal purposes, etc. This study reviews ethnomedicinal and botanic uses of the 196 taxa belonging to 54 families and 113 genera grown in Turkey.

Keywords: Edible plants, flora of Turkey, medicinal uses, plant species

1. Introduction

Turkey lies on intersection of three climatic zones namely European-Siberia, Iran-Turan and the Mediterranean region; surrounded by oceans on three sides, with mountains, plateaus and plains having different heights and topographical features (**Figure 1**). It is located in the Mediterranean climate zone, also seen in inland continental climate with seven ecogeographical regions (Aegean, Black Sea, Central Anatolia, Eastern Anatolia, Marmara, Mediterranean, and South Eastern Anatolia) [1]. Koppen-Geiger climate classification system identifies 3 main and 10 sub climates in Turkey [2].

Hosting different climate types within the boundaries of different flora regions play an important role in the abundance of species, taxa and also endemic plant taxa. According to "Flora of Turkey and The East Aegean Islands" Turkey has 174 families, 1251 genera and more than 12,000 taxons (including species and subspecies and varieties) [3–5]. Approximately 3649 or 1/3rd of these are endemic [6].

The total and endemic number of plant taxa in these regions are given in **Table 1**. Some of these are found in only one, while the others are naturally distributed in more than one ecogeographical regions.

Moreover, it has distinction to become homeland of one among the three oldest civilizations (Indus valley, Nile, and Mesopotamia) in the World. The present day Turkey has honor to host 9 different civilizations (Hatti; Hittite, Urartu, Phrygian, Lydian, Ionian, Carian, Lycian, Hellenic) along with majestic Roman, Byzantine,

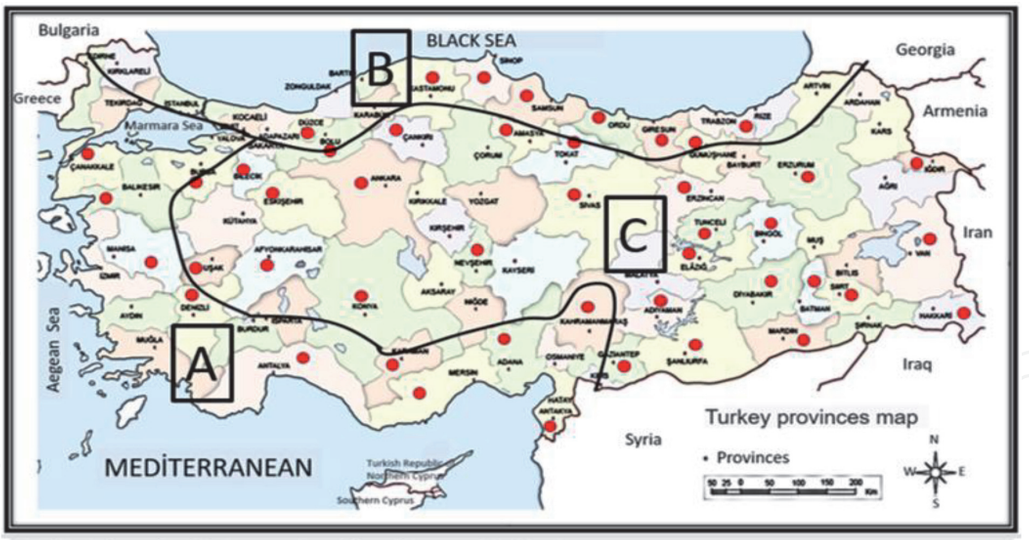

Figure 1.
Map of Turkey, showing different provinces of Turkey and biogeographical regions.

Regions	Number of total taxa in a region	Number endemic plant taxa in a region
Aegean	3369	591
Blacksea	4571	856
Central Anatolian	3488	1030
Eastern Anatolian	4760	1237
Marmara	3519	308
Mediterranean	5487	1755
South East Anatolian	1891	239

Source: [7].

Table 1.
Number of total and endemic plant taxa in Turkey.

Seljuk and Ottoman Empires in the later periods, that has resulted in accumulation of a huge knowledge about use of local flora in traditional medicines and cuisines [8–11].

2. Ethnobotany

The Word ethnobotany, is coined from two Greek words “ethnos”, meaning folk, and “botane” or “botanos”, meaning plants. It is defined as the branch of science that studies relationship between human beings and plants [12–14]; related to their use in foods, medicines, religious rituals, ceremonies and and related chores in a local culture [15]. The therapeutic uses of medicinal herbs is largely desired in both developed and developing countries of the World during these days and are emerging as powerful aid to discover treatments to many diseases and their use in palliative care [16]. The rich cultural history of Turkey has played a distinct role in the plant-human relationship, both in verbal and written form. It has passed down from generation to generation and has become a part of Turkish culture of ethno-medicine-botany over time. In line with advances in technology in recent

years there is increased economic migration from rural areas to cities. This has resulted in reduced understanding and recognition of these plant species, loss of habitat of many plants and have resulted in the risk of disappearance of many plants from the Turkish flora. There is need to protect and guaranty the survival of this knowledge by securing it through transcription for benefit of future generations [17]. Therefore, documenting "Taraditional Ethnobotanical Knowledge" is important for their conservation and proper use of biological resources [5, 18].

It is noted with interest that the first works about medicinal plants were put forward in China, South Asian subcontinent (Indus valley), Egypt (Nile valley) and Turkey (Mesopotamia) followed by Greeks and Roman people.

3. Prescription patterns through times

Prescription patterns belonging to the Hittite civilization are accepted as one of the oldest known prescriptions in the history. Materia Medica, written by Dioscorides, is considered the world's first pharmacopoeia. The book describes 500–600 plants and most of these are grown in Turkey. This book also describe drug preparation methods from plants and their usage [19, 20].

Many medicinal plants and herbal medicines not known to the Western civilizations were used in daily life of the deep-rooted Asian and the Middle Eastern civilizations (present day Iraq, Syria, Saudi Arabia, Turkey, Palestine/Israel, Jordan, Lebanon, Greece, Egypt), FarEastern civilizations (China, Koreas, Japan), South Asian Indian sub continent (present day Pakistan, İndia), the Mayans, the Aztecs and Incas that lived in the Central and Southern America [19].

4. Egyptian, Mesopotamian and Greek periods

Information from transcriptions about Egyptian medicines written on papyrus describe use of plants in ancient Egypt. The most important of these papyrus based prescription were written many years before Common Era (BCE). It is the Ebers Papyrus (discovered by George Maurice Ebers in 1872), that is estimated to have been written in 1550 [19, 20]. Celsus (25 BCE-50 CE, Plinus (23–79 CE), Dioscorides (40–90 CE) and Galenos (129–201 CE) were the World-renowned medical doctors who were trained during the Roman Empire. The prescriptions on the tablets belonging to this period show the number of herbal drugs used by people during Mesopotamian civilization (inTurkey); period was around 250 CE. It is estimated that about 600 medicinal plants were used during the Greeks and 4,000 during the Arab Moroccan civilization [20].

5. Developments during Greek and Roman Periods

Plants and root drugs collected by the ancient Greek physicians, known as rhizomotomy were used in the treatment of various diseases. Hippocrates, who lived in 460–377 BCE; is considered the founder of modern medicine, mentions 236 plant species and their healing effects in his work [19].

5.1 Islamic or Arab period

Apart from the ancient Greek and Egyptian civilizations, the Islamic or Arabs started to translate Greek, Roman South Asian and Iranian books/works into their

own languages from the 7th century, adding significant number of their own contributions for the development of medical science. The most important and famous scientists like al-Razi (850–923); al-Dineveri (895–992); Al-Zahravi (936–1013). Al-Biruni (973–1051) and ibn-i-Sina (Avecena) (980–1037) can be counted among them. These works were continued by many other worth mentioning scientists like ibn-i- Zühür (1094–1162), al Gafiki (? -1165), ibn-i- Rushd (1128–1198), ibn-i-Baytar (1197–1248), Nüveyri (1279–1332) and Davud al Antaki (1541–1599) [19].

5.2 Seljuk and Ottoman periods

The Turks used the traditional practices in Central Asia by synthesizing them together with the traditional practices of Ancient Anatolia. During the Anatolian Seljuk period with the establishment of hospitals (medical centers) in various regions. Gevher Nesibe Sultan hospital was located and established in the Turkish province of Kayseri during this period. It was first example of the modern hospitals. During the Ottoman Empire, Darushifa (Hospitals) were established, in many cities including Bursa, Edirne, Manisa and Istanbul. The most famous medical doctors and surgeons of the Ottoman Empire, include Sherafeddin Sabuncuoğlu (1386–1470) and Merkez Efendi. The Ottomans opened famous hospitals like Tibkhâne-i Amire with the efforts of Shanizade Mehmed Ataullah Efendi (1771–1826) and Behchet Efendi (1774–1834) to modernize medical education in the Ottoman Empire [19].

5.3 Post Democracy Period

After passing to democracy or establishment of the Republic of Turkey, the medical law was enacted based on modern medical practices and put into practice in 1923. Number of Medicine and Pharmacy Faculties, began to rise with the establishment of Istanbul and Ankara universities. These institutions contributed positively to the diagnosis and treatment process and development of modern medical education in Turkey in parallel to the scientific and technological progress in medicine and pharmacy sciences in the World [19]. Today, medical scientists in Turkey continue to benefit and study local flora in line with the local ethnobotanical trends since centuries by diagnosis and treatment methods. The scientists have discovered many active substances necessarry for human and animal health.

The first ethnobotanic works in the modern sense in Turkey are focused on medicinal plant as in the worldwide [19]. In a 70-year period between the years 1928–1997, a total of 765 ethnobotanical studies were conducted in Turkey. These informations are included in the thesis entitled “Republican Turkish Ethnobotanical Research Archive” by Narin Sadıkoglu. The thesis is available in the archive of Istanbul University Faculty of Pharmacy, Department of Pharmaceutical Botany. This study include uses of plants belonging to Sivas, Istanbul and Konya provinces; mostly used in human health, beliefs and used as food [21, 22].

A brief information about 196 taxa (species, subspecies and 43 varieties) belonging to 54 families and 113 genera frequently used in Turkish folk medicines (**Table 2**).

Prof. Dr. Turhan Baytop (1920–2002) has significant work on Turkey’s medicinal plants and flora of Turkey. He collected many plant samples with his research trips in the Anatolian mountains between 1949 and 1999 and brought them to Istanbul University Faculty of Pharmacy Herbarium in his book “With medicinal Plants in Turkey.” He has described medicinal plants used in traditional folk medicine in Anatolia in his book. In his work titled “50 years in the Anatolian mountains”, he has described significant contributors who to the Anatolian (Turkish) flora as follows. The first plant collectors coming to Anatolia were P. Belon (1517–

No	Botanical names	Family	Vernacular names	Parts used	Usage form	Uses	References
1.	*Acorus calamus* L.	Acoraceae	Eğir kökü, Hazanbel	Roots	Infusion	treating kidney ailments; jaundice, removal of toxins from the body, intestinal gas reliever, stomach burn, gout, against bottom wetting in the elderly	[59]
2.	*Adianthum capillis-veneris* L.	Adianthaceae	Baldırıkara	Roots	Decoction	To treat cough and expectorant.	[60]
3.	*Cotinus coggyria* Scop.	Anacardiaceae	Tetere, tetre, tera otu	Roots	—	To treat skin disorders.	[61]
4.	*Apium graveolens* L.	Apiaceae	Kereviz	Roots	Raw, fresh	Taken as food, cooking is made from roots tuber.	[81]
5.	*Caucalis platycarpos* L.	Apiaceae	Kavkal, Pıtırak	Roots	Infusion	Crushed, wrapped using cloth bandage over wound, eczema. Used to treat skin inflammations and eczema and liver disorders.	[63, 64]
6.	*Chaerophyllum crinitum* Boiss.	Apiaceae	Xilok	Roots	Raw, fresh	Freshly consumed as food.	[65]
7.	*Daucus carota* L.	Apiaceae	Havuç	Roots	Raw, fresh decoction	Eye treatment, increase human milk secretion, peeled, abortive, to treat diarrhea and used as expectorant.	[63, 66]
8.	*Eryngium billardieri* Delar.	Apiaceae	Hıyarak, Hazara	Roots, Aerial parts	Raw, fresh Infusion, decoction	Dried and crushed to treat sinusitis, wound, cold, flu, hemorrhoids, kidney and urinary system diseases, toothache, aphrodisiac.	[38, 63, 67]
9.	*Eryngium bornmuelleri* Nab.	Apiaceae	—	Roots, latex	Latex	Latex (roots-stem); to treat toothache.	[68]
10.	*Eryngium campestre* L. *var. virens* Link.	Apiaceae	Sütlü diken, Kuşkonmaz, Şeker dikeni	Roots	Raw, fresh Decoction	Roots are chewed to relieve abdominal pain; treatment of prostate diseases and treatment of prostate cancer.	[69, 70]
11.	*Ferula sp.*	Apiaceae	Çaşır,	Roots	Decoction	Hemorrhoids, strengthen.	[71]
12.	*Ferula communis ssp. communis* L.	Apiaceae	Çakşır otu	Roots	Raw, fresh	When its roots are crushed and mixed with honey, it increases male sex potency	[8, 60]

No	Botanical names	Family	Vernacular names	Parts used	Usage form	Uses	References
13.	*Ferula elaeochytris* Korovin	Apiaceae	Çakşır otu	Roots	Raw, fresh Decoction	Its roots and leaves are used to reduce intestinal dryness and as an aphrodisiac. Treatment aphrodisiac, abdominal pains, ulcer, Increasing milk and meat (animals)	[63, 72]
14.	*Ferula haussknechtii* Wolffex Rech.	Apiaceae	Kermeğ	Roots	Decoction	Wound, wound healing.	[63, 73]
15.	*Ferula longipedunculata* Peãmen	Apiaceae	Çakşır	Roots	Raw fresh	Treatment of aphrodisiac problems.	[63]
16.	*Ferula meifolia* L.	Apiaceae	Çakşır kökü	Roots	Raw fresh	Treating infertility, increasing sex potency in men, lowers blood sugar.	[59]
17.	*Ferula orientalis* L.	Apiaceae	Heliz Kınkor, Kafkorik	Roots	Decoction	Dried and crushed roots and applied to wounds. Psoriasis, digestive. Abdominal pains and hemorrhoid, skin inflammation and burns, vertigo, nausea, diabetes	[74, 75]
18.	*Ferula rigidula* Fisch. Ex DC.	Apieaceae	Heliz	Roots	Raw, fresh	Fresh stems and roots eaten; Kidney stones, cholesterol.	[75]
19.	*Ferulago sylvatica* (Besser) Reichb.	Apiaceae	—	Roots	Decoction	Skin diseases	[63]
20.	*Ferulago trachycarpa* Boiss.	Apiaceae	—	Roots	Raw, fresh Decoction	Peeled, crushed, eaten appetizer, aphrodisiac, stomac ailments,	[63]
21.	*Foeniculum vulgare* Miller.	Apiaceae	Rezene	Roots, fruits, herbs	Decoction	It is used as food. Gas-removing and milk-enhancing properties in stomach ailments. The leaves of the plant have wound healing properties; roots used for diuretic problems treatments. .	[8, 60]
22.	*Glaucosciadium cordifolium* (Boiss.) B.L.Burtt et P.H.Davis	Apiaceae	Sakar otu, Çakşır otu	Roots leaves	—	To treat aphrodisiac effects.	[63]
23.	*Heracleum sphondylium* L. ssp. *ternatum* (Velen.) Brummitt	Apiaceae	Devesil	Roots	Paste, infusion, tea	Hemorrhoids, abdominal pains	[61]
24.	*Petroselinum crispum* (Miller) A.W. Hill	Apiaceae	Maydanoz	Roots	Decoction	To treat ailments of stomach, hemorrhoids	[63, 76, 77]

No	Botanical names	Family	Vernacular names	Parts used	Usage form	Uses	References
25.	*Pimpinella olivieroides* Boiss. & Hausskn.	Apiaceae	Papatya	Roots	Infusion;	To treat asthma	[56, 63, 85]
26.	*Prangos pabularia* Lindl.	Apiaceae	Çakşır	Roots	Infusion;	Taken as tea; or extract. Used as fuel and mixed into animal feed. To Increases resistance, infertility, digestive system, indigestion, strengthening, diabetes, sperm formation	[79]
27.	*Prangos ferulacea* (L.) Lindl.	Apiaceae	—	Roots	Infusion, tea		[63]
28.	*Prangos pabularia* Lindl.	Apiaceae	—	Roots	Infusion	Wound healing; gastric problems, stimulant	[73]
29.	*Smyrnium connatum* Boiss. & Kotschy	Apiaceae	Baldıran	Roots	Raw	Eaten	[80]
30.	*Smyrnium olusatrum* L.	Apiaceae	Deli kereviz	Roots	Decoction	To treat abortion	[63, 82]
31.	*Nerium oleander* L.	Apocynaceae	Zakkum	Roots	Dye	Used to extract dye from roots. Used to dye ropes and threads by boiling roots in the water, dye.	[81]
32.	*Arum elongatum* Steven *subsp. elongatum* Steven	Araceae	Basur otu Yılanyastığı	Roots Tuber	Raw, dried	To treat hemorrhoids; Plant tuber used in into powder form used as capsule.	[83, 84]
33.	*Arum elongatum* Steven *subsp. detruncatum* (C.A. Mey. ex Schott) H. Riedl	Araceae	Gabarcık	Roots	Raw, fresh	Roots are rubbed on the wart to heal them.	[72]
34.	*Arum rupicola var. rupicola* Boiss. (Endemic)	Araceae	Dağsorsalı	Roots	Raw, fresh Infusion	Grated, to treat rheumatism	[86, 87]
35.	*Arum rupicola var. virescens* (Stapf) P.C. Boyce.	Araceae	—	Roots	Decoction	To treat diabetes	[11, 86]
36.	*Dracunculus vulgaris* Schott	Araceae	Yılanpancarı	Roots	Raw, fresh Dried, Decoction	Used in the treatment of rheumatism. Small pieces are swallowed like a pill, treatment of hemorrhoids. Used trait hand cracks.	[60, 81]

No	Botanical names	Family	Vernacular names	Parts used	Usage form	Uses	References
37.	*Hedera helix L.*	Araliaceae	Sarmaşık	Roots	Raw, fresh Decoction	To relieve inflammation in the body, To treaaat rheumatismal diseases	[34, 72]
38.	*Aristolochia bottae* Jaub & Spach;	Aristolochiaceae	Zelındar,	Roots	Dried, Decoction	Roots dried, crushed, applied to wounds in humans and animals. Boiled as tea for to treating wounds, abodominal pains and human parasites	[74]
39.	*Asparagus acutifolius* L.	Asparagaceae	Kuşkonmaz, Zaparna, Tatlı filiz	Roots	Raw, fresh Decoction	Treating liver swelling. Cleans clean the blood; Lumbago, sliced roots	[62, 82, 89]
40.	*Acroptilon repens* (L) DC.	Asteraceae	Karamuk	Roots	Raw, fresh	Used externally for wound treatment after the roots ends (black part) are crushed	[70]
41.	*Arctium tomentosum* Mill.	Asteraceae	Düvetabanı, gelbeni	Roots, leaves	Raw, fresh	Eaten raw or cooked	[90]
42.	*Centaurea regia Boiss. subsp. regia*	Asteraceae	şahkavgalaz	Roots	Raw	To treat blood sugar in diabetes. Consumed for food purposes,	[91]
43.	*Centaurea urvillei* DC. subsp. *armata* Wagenitz	Asteraceae	Çoban çökerten	Roots, stem	Raw	To treat swelling, obesity	[92]
44.	*Chondrilla juncea* L.	Asteraceae	Sakızlı ot, garagavuk	Roots	Roots, latex	Chewing, as expectorant	[92]
45.	*Cichorium intybus* L.	Asteraceae	Hindiba, karakavuk Acıkök Çıtlık	Roots	Raw, fresh decoction	To treat dandruff. Liver and gall bladder pain. Treatment of blood cancer. Used to treat constipation, hemorrhoids. Respiratory and endocrine system ailments and indigestion.	[56, 70, 81, 88, 93–95]
46.	*Cichorium pumilium* Jacq.	Asteraceae	Hidibağ	Roots	Raw, fresh decoction	Used to treat liver diseases	[96]
47.	*Cirsium rhizocephalum* C.A Mey	Asteraceae	Medik, kopuk, amik	Roots	Raw	Cooked	[90]

No	Botanical names	Family	Vernacular names	Parts used	Usage form	Uses	References
48.	*Cirsium pubigerum* (Desf.) DC.	Asteraceae	Kivari avi	Roots		Edema	[73]
49.	*Cnicus benedictus* L.	Asteraceae	Şevketi Bostan	Roots	Raw, freesh, Decoction	Boil and drink water. It is dried and pounded, mixed with honey and eaten. It is used locally to treat vitiligo disease. It is also used as fuel.	[59]
50.	*Gundelia tournefortii* L.	Asteraceae	Kenger otu	Roots	Raw, fresh, Infusion, Decoction	Treatment of endocrine system disorder, nervous system disorder, female/male diseases, cardiovascular diseases. Eaten by adding bulgur and rice. For dental health and increasing appetite.	[67, 94, 95]
51.	*Helianthus tuberosus* L.	Asteraceae	Yer elması	Roots	Raw, fresh	The whole roots, along with its fresh lump, is cooked after it is thoroughly cleaned.	[61]
52.	*Hieracium pannosum* Boiss.	Asteraceae	Sakızotu	Roots	Raw, fresh	Chewing latex obtained from liquid such as milk dry up for chewing.	[83]
53.	*Inula graveolens* (L.) Desf.	Asteraceae	Kokarot, Andız otu, Kefen otu	Roots	Decoction	To treat asthma and breathlesness	[81, 56]
54.	*Lactuca serriola L.*	Asteraceae	Acı marul, Sütlü marul	Roots	Decoction	Decoction	[81, 56]
55.	*Onopordum tauricum* Wild	Asteraceae	Göğündürme	Roots	Raw, fresh	To treat kidney stones.	[72]
56.	*Scolymus hispanicus* L.	Asteraceae	Altın dikeni Sarıca diken Şevketibostan,	Roots	Decoction Raw, fresh	Treatment of kidney stones and hemorrhoids, diabetes, cholesterol and kidney failure.	[34, 81, 97]
57.	*Scorzonera latifolia* (Fisch & C.A. Mey) DC.	Asteraceae	Alabent, Alman sakızı	Roots	Raw, fresh chewing	It is used as raw latex, chewed roots are used antihelmetically.	[100]
58.	*Scorzonera tomentosa* L.	Asteraceae	Alabent Alman sakızı Yer sakızı	Roots	Raw, fresh Chewing	As food, chewed.	[67, 79]
59.	*Taraxacum sintenisii* Dahlst.	Asteraceae	Karahindiba	Roots	Infusion	To treat kidney diseases and stomach burn.	[98]

No	Botanical names	Family	Vernacular names	Parts used	Usage form	Uses	References
60.	*Taraxacum officinale* (L) Weber ex F.H. Wigg	Asteraceae	Karahindiba, Gihoşirik	Roots	Infusion	Consumed as tea. to treat diabetes, cleans the blood, diuretic problems and hepatitis, gives strength to exhausted people. It's salad is made by the local people.	[99] [59]
61.	*Tragopogon dubius* Scop.	Asteraceae,	Yemlik	Roots Leaves	Raw, fresh	Consumed as food and as a vegetable.	[95]
62.	*Tragopogon buphthalmoides* (Dc.) Boiss.	Asteraceae,	Yemlik	Roots		To treat wound healing and intestinal inflammation.	[100]
63.	*Xanthium strumarium L. subsp. strumarium*	Asteraceae	Pıtrak, Sıraca otu	Roots	Decoction	For the treatment of breathlessness and asthma	[81, 56]
64.	*Xanthium spinosum* L.	Asteraceae	Pıtrak dikeni	Roots		To treat kidney and abdominal pains.	[81]
65.	*Berberis crataegina* DC.	Berberidaceae	Karamuk Kızılcık Kızamık Garamık	Roots	Decoction Infusion, dye, tea	It is used in fabric dyeing. Its roots is used internally to treatment diabetes and hemorrhoid. Diuretic. Its extract is taken in cold ailments such as bronchitis. Anti-diabetic Infused in boiling water and 2–3 cups are taken to treat eyes.	[34, 67, 72, 103–105]
66.	*Berberis vulgaris* L.	Berberidaceae	Kızambuk, Hanımtuzluğu	Roots	Decoction Infusion	Wool dyeing to treat asthma and breathlessness.	[7, 69, 95, 97]
67.	*Alkanna froedinii* Rech. f.	Boraginaceae	Mıjmıjok	Roots	Decoction	It is taken as tea, against stomach pains	[74]
68.	*Alkanna orientalis* (L.) Boiss	Boraginaceae	Mıjmıjok	Roots	Decoction	It is taken as tea against, stomach pains.	[74]
69.	*Alkanna orientalis* (L.) Boiss var. *orientalis* (L) Boiss.	Boraginaceae	Sarı-Havacıva	Roots	Decoction	It is taken as tea against abdominal diseases	[97]
70.	*Alkanna tinctoria* (L.)	Boraginaceae	Havacıvaotu	Roots	Decoction, maceration, dye	To treat boils and wounds. Dyeing fabrics	[79]
71.	*Alkanna tinctoria* (L.) Tausch subsp. *glandulosa* Hub.-Mor	Boraginaceae	Havacıvaotu	Roots	Decoction;	To treat hemorrhoids.	[83, 84]

No	Botanical names	Family	Vernacular names	Parts used	Usage form	Uses	References
72.	*Alkanna tinctoria* (L) Tausch subsp. *tinctoria*	Boraginaceae	Havacıva otu; Tüylü Boya, Havajo	Roots	Decoction; dye	Dyeing of fabrics and threads. Applied externally to treat hand cracks and wounds in a short time.	[106, 107]
73.	*Alkanna trichophila* Hub.-Mor. *var. mardinensis* Hub.-Mor.	Boraginaceae	Gorız, hevaceva	Roots	Decoction, maceration, cream	In the treatment of wounds and burns.	[91]
74.	*Alkanna tubulosa* Boiss	Boraginaceae	Kök boya	Roots	Dye	Dyeing wool and woolen threads fabrics and threads	[72]
75.	*Anchusa azurea* Mill. var. azurea	Boraginaceae	Ballık otu	Roots	Tea,	Red dye for dyeing fabrics and threads is obtained from the roots.	[64]
76.	*Anchusa officinalis* L.	Boraginaceae	Sığır Dili	Roots	Tea, dye	Dyeing fabrics and threads	[108]
77.	*Arnebia densiflora* (Nordm) Lebed	Boraginaceae	Boya otu	Roots	Dye	Its roots are boiled in water and its juice is used in yarn dyeing (orange color).	[70]
78.	*Echium angustifolium* Miller	Boraginaceae	Kızılcık dikeni, kızılcık otu	Roots	Oinment	Its roots are used for wound healing. It is used as an ointment with butter for trating wounds.	[109]
79.	*Heliotropium europaeum* L.	Boraginaceae	Kırcinnik otu; Siğil otu	Roots	Raw, fresh, oinment	Used against scorpion bites..	[97]
80.	*Onosma alborosea* Fisch. & C.A. Mey. subsp. *alborosea* var. *alborosea*	Boraginaceae	Mijmijok	Roots	Raw, fresh, ointment	Used to treat wound healing, to facilitate the delivery by pregnant women during childbirth.	[91]
81.	*Raphanus sativus* L.	Brassicaceae	Karaturp	Roots,	Raw, fresh	Used to treat asthma, breathlessness and cough.	[110]
82.	*Raphanus raphanistrum* L.	Brassicaceae	Yabani turp	Roots, leaves	Raw,	Roots and leaves are appetizing.	[64]
83.	*Sinapis arvensis* L.	Brassicaceae	Hardal otu, sarıhardal	Roots	Raw, fresh	Abdomimal pains.	[61]
84.	*Sinapis arvensis* L.	Brassicaceae	Hardal otu, sarıhardal	Roots	Raw, fresh	To relieve headache.	[70]

No	Botanical names	Family	Vernacular names	Parts used	Usage form	Uses	References
85.	*Campanula lyrata* Lam. Subsp. *lyrata*	Campanulaceae	İnek memesi	Roots	Raw, fresh	It is eaten as food. It is consumed by peeling off roots.	[111]
86.	*Campanula involucrata* Aucher ex A.DC.	Campanulaceae	Çan çiçeği	Roots	Raw, fresh	Eaten fresh after peeling.	[112]
87.	*Campanula glomerata* L.	Campanulaceae	Çan çiçeği	Roots	Raw, fresh	It is consumed as a vegetable.	[111]
88	*Campanula rapunculus* L.	Campanulaceae	Çıngırak otu, Çan çiçeği	Roots, leaves	Raw, fresh	As human milk enhancer. To treat in wound healing and constipation. To treat kidney, bladder stones and stomach disorders.	[111]
89.	*Campanula trachelium* L.	Campanulaceae	Çan çiçeği	Roots	Fresh	It is consumed as a vegetable.	[111]
90.	*Capparis spinosa* L. var. *spinosa*	Capparaceae	Gebre otu, kapari	Roots	Decoction mucilage	Treatment of eczema.	[81]
91.	*Capparis ovata* Desf. var. *herbacea* (Willd.) Zoh.	Capparaceae	Keber, kebere	Roots	İnfusion, decoction	To treat diuretic problems.	[97]
92.	*Dipsacus laciniatus* L.	Caprifoliaceae	Fesçitarağı	Roots	—	To diuretic problems and treat eczema.	[8, 67]
93.	*Sambucus ebulus* L.	Caprifoliaceae	Bizga, karabubu, mürver,	Roots	Decoction	Antirheumatic. Treatment of ear pain.	[61, 78, 113]
94.	*Sambucus nigra* L.	Caprifoliaceae	Ağaç mülveri, mürver	Roots	Decoction, oinment	Antirheumatic, analgesic, hemorrhoids	[61]
95.	*Dianthus elegans* d'Urv. var. *elegans*	Caryophyllaceae	Karanfil	Roots	Decoction	The roots are boiled and taken as tea.	[72]
96.	*Gypsophila pallida* Stapf	Caryophyllaceae	Çöven	Roots	Raw, Decoction	The roots of this plant are boiled in water. The extract is added to molasses to prepare a dessert called helva.	[114]
97.	*Silene caryophylloides* (Poir.) Otth subsp. *echinus* (Boiss.& Heldr.) Coode & Cullen	Caryophyllaceae	Geven	Roots	Raw, fodder	Roots were crushed and used as fodder. Animals are fed with this fodder during winter.	[34]

No	Botanical names	Family	Vernacular names	Parts used	Usage form	Uses	References
98.	*Cistus laurifolius* L.	Cıstaceae	Tavşanak, Tavşancıl	Roots	Decoction	Its decoction prepared from fresh or dried roots is used to alleviate diabetes. Dried herbs and roots are used as fuel.	[81]
99.	*Convolvulus arvensis* L.	Convolvulaceae	Tarla sarmaşığı	Roots, latex	Roots extract	Roots extract is used as a laxative; Its roots are also used to treat constipation.	[8, 60]
100.	*Bryonia alba* L.	Cucurbitaceae	Yer kabağı	Roots	Decoction	Roots were used to treat menstrual problems.	[109]
101.	*Bryonia aspera* Stev ex Ledeb	Cucurbitaceae	Kındrok	Roots	Raw, decoction, oinment	To treat Intestinal ailments and wound healing.	[74]
102.	*Bryonia multiflora* Boiss. & Heldr.	Cucurbitaceae	Ülüngür	Roots	Raw, tea	To lower blood sugar.	[91]
103.	*Echalium elaterium* (L) A. Rich.	Cucurbitaceae	Acı dülek, Acı kavun, Acı hışır, Deli hışır	Roots, leaves, fruits	Fresh	To treat hemorrhoids, eczema, itching, headache, sinusitis (Drop Nostril DN). To rheumatism and abdominal pain.	[60, 82, 89, 93]
104.	*Cyperus rotundus* L.	Cyperaceae	Topalak otu	Roots	Raw	Eaten	[69]
105.	*Cyperus rotundus* L.	Cyperaceae	Topalak otu	Roots	Raw, tea	Taken as tea.	[81]
106.	*Dioscorea communis* (L.) Caddick & Wilkin	Dioscoreaceae	Dolanbaç	Roots	Raw	Body pains.	[115]
107.	*Tamus communis* L.	Dioscoreaceae	Acı Filiz, yadırgan,	Roots	Roots, extract	Used as a pain reliever and treat rheumatism.	[89]
108.	*Tamus communis* L. subsp. *communis*	Dioscoreaceae	Sarmaşık	Roots	Raw, latex	Sliced roots used to treat rheumatism, eczema, wound.	[82]
109.	*Scabiosa argenta* L.	Dipsacaceae	Uyuz otu	Roots	Decoction, ointment	To treat Its roots are used as urinary problems, diuretic wound healing.	[96]
110.	*Euphorbia apios* L.	Euphorbiaceae	Sürgen otu	Roots	Raw, fresh, cream	Causes diarrhea when the roots is eaten	[89]

No	Botanical names	Family	Vernacular names	Parts used	Usage form	Uses	References
111.	*Euphorbia rigida* Bieb.	Euphorbiaceae	Sütleğen,	Roots	Decoction	To treat eczema, decoction is prepared from fresh roots is used.	[81]
112.	*Astragalus angustifolius* Lam. subsp. *pungens* (Willd.)Hayek	Fabaceae	İnce geven	Roots	Raw, decoction	Its roots is used in cosmetics and glue production. Its roots are collected and sold as second quality *Gypsophila*.	[8, 38, 67]
113.	*Astragalus brachycalyx* Phil.		Geven	Roots	Decoction,	Decoction, drink 1 tea glass before meals.	[116]
114.	*Astragalus microcephalus* Wild	Fabaceae	Geven	Roots, latex	Raw, fodder	Externally, fractures of the hand used to treat wart. The roots are crushed and used as animal fooder.	[100]
115.	*Astragalus microcephalus* Wild subsp. *microcephalus*	Fabaceae	Geven, keven	Roots, latex	Decoction	The liquid coming out of its roots is used as glue. If the roots is boiled and taken in the morning, it dissolves kidney stones.	[105]
116.	*Astragalus latexmifer* Lab.	Fabacea	Geven	Roots, latex	Raw, fresh	Used in glue making; The liquid leaking from the roots when it is cut, is applied to the legs for joint pain.	[79, 100]
117.	*Glycyrrhiza glabra* L.	Fabaceae	Meyan	Roots	Decoction, maceration	To treat digestive, abdominal pains, diabetes, cancer. Respiratory and endocrine system disorders, skin problems.	[94, 95, 116]
118.	*Glycyrrhiza glabra* L. var. *glabra*	Fabaceae	Meyan	Roots	Decoction maceration	To treat wounds, cold and flu, abdominal pains.	[74]
119.	*Glycyrrhiza glabra* L. var. *glabra*	Fabaceae	Meyan	Roots	Decoction	Digestive aid.	[117]
120.	*Glycyrrhiza glabra* L. var. *glandulifera* (Waldst et Kit), Boiss.	Fabaceae,	Meyan	Roots	Decoction	It is used as a breast softener, expectorant, reducing the harmful effect of nicotine, diuretic, blood pressure, kidney stone reducer, dry cough remover. It is used to treat of cold, flu. To treat stomach ulcers and bronchitis.	[81, 107]
121.	*Ononis spinosa* L. ssp. *leiosperma* (Boiss.) Širj.	Fabaceae	Kaplıca, Kimya otu, Kuşkonmaz	Roots	Infusion, cream	It is used treatment of skin disorders, and urinary ailment, diuretic.	[61]

No	Botanical names	Family	Vernacular names	Parts used	Usage form	Uses	References
122.	*Quercus cerris* L. var. *cerris*	Fagaceae	Çalı meşesi	Roots	Decoction	To treat wound-burn treatment, a clean bandage dipped in decoction prepared from its roots is wrapped on the wound-burn.	[81]
123.	*Quercus coccifera* L.	Fagaceae	Piynar	Roots	Decoction	To treat burns, the liquid obtained by boiling the roots is good when applied to burns. Charcoal is made from the roots and stems.	[81, 105]
124.	*Gentiana lutea* L.	Gentianaceae	Centiyan	Roots	Raw, fresh maseration	It is used as a carminative, antiperiodic expectorant and blood purifer. Treatment of chronic torpid liver dyspepsia, gout and enlarged spleen.	[126–128]
125.	*Geranium macrostylum* Boiss.	Geraniaceae	Deve potuğu	Roots	Raw, fresh	Used a food	[34]
126.	*Hypericum atomarium* Boiss	Hypericaceae	Kantaron, mide otu	Roots	Decoction	Roots used to treat abdominal, stomach diseaseas and intestinal disorders.	[34]
127.	*Hypericum perforatum* L.	Hypericaceae	Kantaron	Roots	Decoction	To treat stomach and intestinal ailments.	[34, 95]
128.	*İris germanica* L.	İridaceae	Mavruz Urfaa, Süsen	Roots	Raw, fresh	It's roots are also known as violet roots; It is dried and powdered, diluted and applied to the teeth like toothpaste.	[81]
129.	*Ajuga chamaepity* (L) Schreber	Lamiaceae	Bozca otu	Roots	—	Used in animals, for strengthening.	[110]
130.	*Mentha arvensis* L.	Lamiaceae	Nane	Roots	—	The common cold; abdominal pains; cough	[110]
131	*Asphodelus aestivus* Brot.	Liliaceae	Çiriş Otu. Çirişlik otu, Deve soğanı Kiriş otu,	Roots tuber	Raw, fresh, decoction	Used as shoe glue. to treat wound, abdominal pains and stomach wounds.	[80, 81, 89]
132.	*Asphodelus ayardii* Jahand. & Maire.	Liliaceae	Ciriş, ciriş otu	Roots	Raw, fresh	To treat wound and treatment of eczema.	[92]
133.	*Asphodeline baytopiae* Tuzlaci	Liliaceae	İnce ciriş,	Roots	Raw, fresh	To treat wound and treatment of eczema.	[92]

No	Botanical names	Family	Vernacular names	Parts used	Usage form	Uses	References
134.	*Eremurus spectabilis* M. Bieb	Liliaceae	Gullık, çiriş	Roots	Decoction, Raw, fresh, oinment	To treat rheumatism, headache, Ointment prepared from its roots is used in the treatment of scabies and syphilis.	[8, 67, 74]
135.	*Ruscus aculeatus* L. var. *aculeatus*	Liliaceae	Deve çalısı, enir, tavşan elması, tavşanmemesi	Roots	Raw, infusion, decoction	Its roots are used to treat kidney stone, nephritis.	[55, 61, 102]
136.	*Ruscus aculeatus* L.	Liliaceae	Tavşanmemesi	Roots	Dye	Black dye	[108]
137.	*Alcea calvertii* (Boiss.) Boiss.	Malvaceae	Hıra çiçeği	Roots	Infusion, ornamental	It provides a beautiful view by culturing in the gardens. To reduce kidney stones and used as ornamental plant.	[38, 67]
138.	*Malva neglecta* Wallr.	Malvaceae	Ebegümeci Ebemgümeci Tolık	Roots	Decoction	To relieve sore throat and tonsillitis. Abdominal pains and swelling on abdomen. To treat gynecological diseases and infertility treatment. It is used to give vigor to the body and to protect against cancer.	[64, 70, 74]
139.	*Malva sylvestris* L.	Malvaceae	Ebemgümeci, kömeç,	Roots, leaves	Decoction	Used externally, for the treatment of hemorrhoids, acne. To treat small or bovine animals suffering from mastitis.	[69, 81]
140.	*Morus alba* L.	Moraceae	Dut	Leavesroots	Infusion	Infusion it is used making molasse	[62]
141.	*Morus nigra* L.	Moraceae	Kara Dut	Roots leaves	Decoction	The roots or roots bark is used as a purgative and tapeworm reducer.	[8, 67]
142.	*Peganum harmala* L.	Nitrariceae	Nazar otu, üzerlik	Roots, stems leaves	—	Disinfection	[84]
143.	*Orchis adenocheila* Czerniak.	Orchidaceae	Salep	Roots	Raw	Ground roots (with milk); It is used to treat digestive system disorders.	[94]

No	Botanical names	Family	Vernacular names	Parts used	Usage form	Uses	References
144.	*Orchis sp.*	Orchidaceae	Salep	Roots	Ointment decoction, tea,	It gives strength to the body. Used to treat wounds, boils, inflammation. It strengthens the heart and is good to treat mental fatigue.	[79]
145.	*Apropyron repens* (L) P. Beauv.	Poaceae	Ayrık otu	Roots	Tea, ointment	The liquid obtained by boiling the roots is used against arthrosis and rheumatism diseases.	[95]
146.	*Elytrigia repens* (L.) Desv. ex Nevski	Poaceae	Ayrık otu	Roots	Tea, ointment	It is said to be used in prostate and kidney related disorders. It is also used as fuel.	[59]
147.	*Plantago lanceolata* L.	Plantaginaceae	Demra otu, Sinirotu	Roots	Tea, Decoction	To treat abdominal swelling.	[105]
148.	*Plantago major* L. ssp. *intermedia* (Gilib.) Lange	Plantaginaceae	Damar otu, sinirli ot	Roots	Decoction	Tuberculosis	[61]
149.	*Platanus orientalis* L.	Platanaceae	Çınar	Roots	Decoction, dye, tea	If it is boiled, a red dyeing fabrics and threads.	[89]
150.	*Platanus orientalis* L.	Platanaceae	Anadolu çınar	Roots	Tea, dye	Roots are used against snake bites.	[8, 60]
151.	*Polypodium vulgare* L.	Polypodiaceae	Karabaldır otu, Altın otu,	Roots	Decoction	Decoction, if taken warm, relieves abdominal swelling and pain	[89]
152.	*Rheum ribes* L.	Polygonaceae	Işğın, uşgun Eşgın,	Roots Aerial parts	Raw fresh, infusion decoction	To treat asthma, diabetes, kidney stones, heart diseases, blood pressure and stomach upset. Constipating and used as an antihelmentic. Hemorrhoids traetments.	[8, 67, 95, 97, 100, 116, 118]
153.	*Rumex alpinus* L.	Polygonaceae,	Kuzukulağı, Efelek, Labada	Roots	Infusion	Used as laxative effect. To treat boils. Diuretic and antipyretic treatments.	[8, 67]
154.	*Rumex crispus* L.	Polygonaceae,	İlabada, kuzu kulağı Lapuşa	Roots	Decoction	to treat abdominal pain and colds. Diabetes, digestive, inflamation and Itching.	[61, 81, 100]
155.	*Primula veris* L.	Primulaceae	Çuha çiçeği	Roots		Used as expectorants.	[113, 119]
156.	*Plumbago europaea* L.	Plumbaginaceae	Artoğa	Roots		Conceiving pregnancy in women.	[98]

No	Botanical names	Family	Vernacular names	Parts used	Usage form	Uses	References
157.	*Ranunculus marginatus* d'Urv. var. *marginatus*	Ranunculaceae	Sevdaçiçeği suçiçeği	Roots		Itching	[61]
158.	*Ranunculus ficaria* L.	Ranunculaceae	Basur otu, düğün çiçeği		Decoction, ointment, tea	Treatment of hemorrhoids.	[59]
159.	*Reseda lutea* L. *var. lutea*,	Resedaceae	Muhabbet çiçeği Şamdan otu	Roots	Decoction, dye	Used in dyeing wool. Used to relieve abdominal pain.	[70, 107, 121]
160.	*Agrimonia eupatoria* L.	Rosaceae	Fıtık otu	Roots		It is used in the treatment of prostate and edema	[120]
161.	*Crataegus aronia* (L) Bosc. Ex DC. var. *aronia*	Rosaceae	Alıç	Roots	Decoction	To treat asthma and breatlessness	[70]
162.	*Crataegus monogyna* Jacq. subsp. *monogyna*	Rosaceae	Alıç	Roots	Decoction	To treat arteriosclerosis lowering high blood pressure. It relieves stomach ailments, asthma and shortness of breath.	[70, 103]
163.	*Crataegus orientalis* Palas ex M. Bieb.	Rosaceae	Kırmızı alıç	Roots	Decoction	The leaf+flower or roots are boiled and taken, good to treat diabetes, heart palpitations, fatigue, insomnia	[79]
164.	*Crataegus orientalis* Palas ex M. Bieb. var. *orientalis*	Rosaceae	Bilan - Kırmızı alıç	Roots	Decoction	To treat rheumatic pains and against to swelling. Abdominal pains, hert diseases.	[70, 74]
165.	*Crataegus tanacetifolia* (Lam.) Pers.	Rosaceae	Sarı alıç	Roots	Decoction	Good to treat diabetes, heart palpitations, fatigue, insomnia.	[79]
166.	*Geum urbanum* L.	Rosaceae	Kurfil	Roots	Decoction,	To treat constipation.	[65, 120]
167.	*Potentilla speciosa* Willd	Rosaceae	Roots tea	Roots	Infusion	Infusion	[62]
168.	*Potentilla recta* L.	Rosaceae	Beş parmak otu, Acı hayıt		Decoction,	To treat heartburn and relieve toothache.	[64]
169.	*Purunus spinosa* L. ssp. *dasyphylla* (Schur) Domin.	Rosaceae	Güvem, Güvem tikeni	Roots	Tea	Liver diseases	[61]

No	Botanical names	Family	Vernacular names	Parts used	Usage form	Uses	References
170.	*Pyracantha coccinea* Roemer	Rosaceae	Ateş dikeni, Tavşan elması,	Roots	Decoction, tea	To treat kidney stone	[110]
171.	*Rosa canina* L.	Rosaceae	Kuşburnu Yaban gülü Köpekgülü	Roots fruits	Infusion decoction,	It is used in the treatment of hemorrhoids, shortness of breath, bronchitis, cough, cold and constipation, blood pressure regulation, diabetes, dierrhea and urinary tract diseases.	[34, 56, 59, 74, 78, 100, 117, 122, 123]
172.	*Rosa gallica* L.	Rosaceae	Kuşburnu	Roots	Decoction, tea	As herbal tea	[29]
173.	*Rubus sp*.	Rosaceae	Böğürtlen	Roots	Infusion, tea	By brewing, endocrine system disease	[94]
174.	*Rubus caesius* L.	Rosaceae	Böğürtlen Tuntırk	Roots	Decoction, infusion	Blackberry roots is boiled and taken for 2 meals; To increase male potency and abdominal pains.	[74, 79]
175.	*Rubus canescens* DC.	Rosaceae	Böğürtlen	Roots leaves	Decoction, infusion	Infusion; bronchitis, asthma, diabetes mellitus, sedative. If the roots is boiled and taken, it is used in the treatment of infertility and stomach ailments.	[116, 120]
176.	*Rubus canescens* DC. var. *canescens*	Rosaceae	Çobanköşteği Böğürtlen	Fresh, shoots roots	Decoction, infusion	Boiled and used twice a day as a strengthener, diuretic, and protector against diabetes. The decoction is taken to pour out kidney and bladder sand. It is used to treat diabetes, hemorrhoids and diuretic.	[99, 123]
177.	*Rubus canescens* DC. var. *glabratus* (Godron) Davis et Meikle	Rosaceae	Böğürtlen	Roots	Decoction, tea	It is appetizing. Effective against Pneumonia. Increase male potency	[79, 89]
178.	*Rubus discolor* Weihe & Nees	Rosaceae	Böğürtlen	Fruits, roots, leaves	Infusion, decoction, tea	To treat diabetes. ıt is diuretic. To treat pneumonia, abdominal pains. Dyeing of fabrics and threads. The dye is obtained by boiling the roots.	[105, 107, 113, 118, 120]
179.	*Rubus hirtus* Waldst. & Kit	Rosaceae	Böğürtlen	Roots	Decoction, tea	Treatment of nephritis and prostate and abdominal pains.	[113, 120]

No	Botanical names	Family	Vernacular names	Parts used	Usage form	Uses	References
180.	*Rubus idaeus* L.	Rosaceae	Ahududu	Fruits roots	Decoction, tea	The roots is boiled and taken against inflammation.	[97]
181.	*Rubus sanctus* Schreber	Rosaceae	Böğürtlen Orman üzümü Karamama, Dırık, Tiri, Garaltı	Roots; flower, leaves, fruits	Infusion, decoctio, ointment	In the treatment of kidney stones, prostate and cancer, breast cancer, abdominal ailments, hemorrhoids, and as a diuretic and cough suppressant, hemorrhoids and diabetes. Skin diseases. It is diuretic, cancer and asthma and breathlessness effective against pneumonia if it is boiled and taken with nettle roots.	[34, 56, 60, 62, 71, 81, 89, 91, 93, 96, 101, 113, 116, 120]
182.	*Rubus saxatilis* L.	Rosaceae	Böğürtlen	Roots	Decoction, tea	Blackberry roots is boiled and taken for 2 meals; provides sperm formation	[79]
183.	*Rubus tericaulis* P. J. Müll.,	Rosaceae	Böğürtlen dikeni	Roots	Decoction, tea	The roots are boiled and the boiled water is used to treat abdominal pains.	[113]
184.	*Rubia tinctorium* L.	Rubiaceae	Bostan boyası, Boya pürçü Dil kanatanotu	Roots	Raw, fresh, dye, tea	Red dye is obtained from the roots. Dyeing cotton, silk and wool treating rheumatism pains, eczema.	[29, 89, 93, 100, 123, 124]
185.	*Salix caprea* L.	Salicaceae	Söğüt ağacı	Roots	Decoction	Treatment of asthma and breathlessness.	[60]
186.	*Verbascum kotschyi* Boiss. & Hohen.	Scrophulariaceae	Meçelik	Roots	Decoction, tea	To treat cracks and wounds.	[106]
187.	*Verbascum thapsus* L.	Scrophulariaceae	Sığır kuyruğu	Roots	Decoction	To treat migraine, headache and toothache.	[79]
188.	*Mandrago officinarum* L.	Solanaceae	Adamotu	Roots	Raw, ointment, tea	Pain reliever, to treat skin diseases such as eczema, to treat Parkinson's and Alzheimer's disease and increase male potency.	[59]
189.	*Tilia argentea* Desf. Ex DC.	Tiliaceae	Ihlamur	Roots	Infusion	To treat cold	[61, 129, 130]
190.	*Ulmus minör* Miller subsp. *minor*	Ulmaceae	Karaağaç	Roots	Raw, Decoction	Anaelgesic, muscle relaxants, correction of wrong, union bones and treat menstrual period diseases.	[109]

No	Botanical names	Family	Vernacular names	Parts used	Usage form	Uses	References
191.	*Ulmus minör* Miller subsp. *canescens* (Meliville) Browicz & Zelinski	Ulmaceae	Buzi Karaağaç	Roots	Decoction, ointment	To treat rheumatic disaases and hemorrhoids.	[70, 74]
192.	*Ulmus glabra* Huds	Ulmaceae	Karaağaç	Roots	Decoction, ointment	Treat woundsi inflamation and cancer.	[93, 100]
193.	*Urtica dioica* L.	Urticaceae	Isırgan otu Çakır Isırgan Gicirgen Cigirgen Yandırgan, Dalagan,	Roots and Leaves	Decoction, infusion, tea, raw, food	In cancer treatment, as a tumor minimizer and cancer prevention. to treat eczema. Urinary tract inflammation; To relieve lowback pain and to eliminate vascular occlusion, conceiving pregnancy in women. It is a blood cleanser, diuretic, appetizer, analgesic and muscle relaxant. It is used to treat rheumatism pain. Treatment of nephritis, abdominal ailments and baldness, prostatitis.	[8, 56, 60, 61, 67, 72, 81, 82, 89, 102, 109, 110, 129]
194.	*Urtica urens* L.	Urticaceae	*Cılağan ısırgan*	Roots leaves	Decoction	Blood cleanser, diuretic and appetizer and treatment of cancer.	[8, 67, 82]
195.	*Valeriana officinalis* L.	Valerianaceae	Kedi otu	roots and leaves	Decoction infusion, tea	To treat depression, nervous disease, beneficial against insomnia, without addiction. It is used as a sedative in nervous system disorder.	[59, 94, 96]
196.	*Tribulus terrestris* L.	Zygophyllaceae	Çoban çökerten	Roots	Decoction	To treat kidney sand, hemorrhoids	[83]

Table 2.
Ethnobotanical uses of roots of some medicinal plants species in Turkey.

1567), L. Rauwolff (1535–1596), J.P. Tournefort (1656–1708). Apart from these; G. A. Olivier (1756–1814), P.M.R Aucher-Eloy (1793–1838), K.H.E. Koch (1809–1879), E. Boiser (1810–1885), G.T. Kotschy (1813–1866), E. Bourgeau (1813–1877), P. Tchihatcheff (1818–1890), B. Balansa (1825–1891), L. Charrel (1839–1924), P. Sintenis (1847–1907)), W. Siehe (1859–1928), JFN Bornmüller (1862–1948), K. Krause (1883–1963), P.M. Zhukovsky (1888–1975), O. Schwarz (1900–1983), A. Huber-Morath (1901–1990), and Peter Handland Davis (1918–1983), [19].

5.4 Recent trends and common practices

Continuing to many researchers ethnobotanical studies in recent years intend to describe Turkey's flora, patterns thir use, information about the chemical contents and their distribution areas [8, 13, 17, 22–34], in Turkey in traditional folk medicine in usage patterns and ethnobotany based studies [24, 35–130].

Also ethnobotanical studies have been done to describe medicinal plants sold to the public for therapeutic purposes in regional herbalists shops and involving the identification of the drugs belonging to commonly used plant species [22, 50–58].

Developing of medicinal, chemical and pharmaceutical sciences and technologies, are continuously contributing to the development and understanding of many new medicinal characteristics of locally grown plant species.

The plant taxa or their products are used for several oral and topical treatments against described diseases and malfunctions and energy boosters. Some of these plants are also used in other industries like food, paint, cosmetics, animal feed, bio diesel production or directly as fuel.

6. Conclusion

It is important to document traditional knowledge and its utilization in local health systems. This study has reviewed and evaluated traditional strategies of plants belonging to 54 families, 113 genera and 196 taxa (species, subspecies, varieties) that serve as base to understand local use of these plants in Turkey. This review can provide an excellent source of knowledge to recognise and compare existing and emerging treatment methods. The study has great significance for creating awareness among people in Turkey, where the rate of migration from rural to urban areas is very fast.

Some plant species and their applications as listed in **Table 2** could be highly poisonous. Their described applications are traditional usage forms. They must be taken very carefully after consulting an expert medical doctor.

Conflict of interest

The authors declare no conflict of interest. All authors contributed equally in the preparation of manuscript.

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References

[1] Avcı M. The floristic regions of Turkey and geographical approach for Anatolian diagonal. Türk coğrafya dergisi 1993; 28:225-248.

[2] Öztürk M, Çetinkaya G, Aydın S. Köppen-Geiger İklim Sınıflandırmasına Göre Türkiye'nin İklim Tipleri. Coğrafya Dergisi. 2017; 35: 17-27. doi: 10.26650/JGEOG295515

[3] Davis P.H. Flora of Turkey and The East Aegean Islands, Vol. 1-9, Edinburgh University Press, Edinburgh. 1965-1985.

[4] Güner A, Özhatay N, Ekim T, Başer K.H.C. Flora of Turkey, Volume 11, Edinburgh University Press. Edinburgh, 2000.

[5] Kendir G, Güvenç A. Etnobotanik ve Türkiye'de Yapılmış Etnobotanik Çalışmalara Genel Bir Bakış. Hacettepe University Journal of the Faculty of Pharmacy. 2010; 1: 49-80.

[6] Güner A, Aslan S, Ekim T, Vural M, Babaç M.T. Türkiye Bitkileri Listesi. Damarlı Bitkiler, Nezahat Gökyiğit Botanik Bahçesi ve Flora Araştırmaları Derneği Yayını. 2012; 262.

[7] Anonymous 2020. DOKAP Bölgesinde tıbbi ve aromatik bitki yetiştiriciliğinin yaygınlaştırılması projesi Eğitim Kitabı, p: 129.

[8] Baytop T. Turkiye'de Bitkiler ile Tedavi. Nobel Tip Kitabevleri; Bitkibilim, Sifalı Bitkiler, II. baskı., Nobel Tıp Kitapevleri Ltd. Şti., Tayf Ofset Baskı. 1999. 480 p. İstanbul.

[9] Baser, K.H.C. Most Widely Traded Plant Drugs of Turkey. In: Traditional and Alternative Medicine-Research & Policy Perspectives (Eds.: Tuley De Silva et al.), Chapter 46. 2009. 443-454. NAM-Daya Publ. House, Delhi-India.

[10] Öztürk M. Ethnobotany-Time for a New Relationship-Case Study from Turkey. 11th National Meeting of Plant Scientists (NMPS) and 2nd Intern. Conf. of Plant Scientists (ICPS-2011), 22-24 Feb. 2011. GC University Lahore-Pakistan.

[11] Altundağ E, Öztürk M. Ethnomedicinal studies on the plant resources of east Anatolia Turkey, Procedia Social and Behavioral Sciences 2011;19: 756-777.

[12] Balick M.J, Cox P.A. Plants, People, and Culture: The science of ethnobotany. Scientific American Library, 1996; 1-24; New York.

[13] Ertuğ F. Etnobotanik çalışmaları ve Türkiye'de yeni açılımlar. Kebikeç. 2004; 18: 181-187.

[14] Polat R, Çakıloğlu U, Ertuğ F, Satıl F. An evaluation of ethnobotanical studies in eastern Anatolia. Biological Diversity and Conservation 2012; 5.2: 23-40.

[15] Ugulu İ. Traditional ehnobotanical knowledge about medicinal plants used for external therapies in Alaşehir, Turkey. İnt. J. Med. Arom. Plants, 2011; 2:101-106. ISSN: 2249-4340

[16] Bozyel ME, Bozyel-Merdamert E, Benek A, Turu D, Yakan MA, Canlı K. Ethnomedicinal Uses of Araceae Taxa in Turkish Traditional Medicine. International Journal of Academic and Applied Research (IJAAR), 2020; 4.5: 78-87.

[17] Kargıoğlu M, Cenkci S, Serteser A, Konuk M, Vural G. Traditional uses of wild plants in the middle Aegean region of Turkey. Human Ecology, 2010; 38.3: 429-450.

[18] Muthu C, Ayyanar M, Raja N, Ignacimuthu S. Medicinal plants used by

traditional healers in Kancheepuram district of Tamil Nadu, India. J Ethnobiol Ethnomed. 2006; 7.2:43. doi: 10.1186/1746-4269-2-43. PMID: 17026769; PMCID: PMC1615867.

[19] Baydar H. Tıbbi ve Aromatik Bitkiler Bilimi ve Teknolojisi, Süleyman Demirel Üniversitesi Ziraat Fakültesi 4. Baskı; Yayın no: 51 2013. 303 p. ISBN: 975-7929-79-4.

[20] Keykubat B. Tıbbi Aromatik Bitkiler ve İyi Yasam, İzmir Ticaret Borsası. Ar-Ge Müdürlüğü yayını, İzmir 2016.

[21] Sadıkoğlu N. Cumhuriyet Dönemi Türk Etnobotanik Araştırmalar Arşivi, Yüksek Lisans Tezi. İstanbul Üniversitesi, Sağlık Bilimleri Enstitüsü; 1998.

[22] Öztürk F, Dölarslan M, Gül E. Etnobotanik ve Tarihsel Gelişimi (Ethnobotany and Historical Development) Türk Bilimsel Derlemeler Dergisi 2016; 9.2:11-13.

[23] Yıldırımlı Ş. Etnobotanik ve Türk Etnobotaniği, Kebikeç, Alp Matbaası, Ankara, 2004; 17: 175-193

[24] Ertuğ F. An ethnobotanical study in Central Anatolia (Turkey). Econ Bot. 2000; 54: 155. https://doi.org/10.1007/BF02907820

[25] Ertuğ F. Bodrum Yöresinde Halk Tıbbında Yararlanılan Bitkiler, 14. Bitkisel İlaç Hammaddesi Toplantısı, Bildiriler, K.H.C. Başer ve N. Kırımer (Eds.), Eskişehir Mayıs 2002; 29-31.

[26] Bağcı Y. Aladağlar (Yahyalı, Kayseri) ve Çevresinin Etnobotanik Özellikleri, Ot Sistematik Botanik Dergisi, 2000; 7.1:89-94.

[27] Abay G. Kılıç A. Pürenbeleni ve Yanıktepe (Mersin) yörelerindeki bazı bitkilerin yöresel adları ve etnobotanik özellikleri. Ot Sistematik Botanik Dergisi, 2001; 8.2: 97-104.

[28] Akçiçek E. Vural M. Kumalar Dağı (Afyon) ve çevresindeki bazı bitkilerin yöresel adları ve etnobotanik kullanımları. Ot Sistematik Botanik Dergisi, 2003, 10.2: 151-162.

[29] Özgen U. Kaya Y. Coşkun M. Ethnobotancal studies in the villages of the district of Ilica (Province Erzurum), Turkey. Economic Botany, 2004; 58.4: 691-696.

[30] Şimşek I, Aytekin F, Yeşilada E, Yıldırımlı Ş. An Ethnobotanical Survey of the Beypazarı, Ayaş and Güdül District Towns of Ankara Province (Turkey), Economic Botany 2004; 58.4: 705-720.

[31] Kahraman A, Tatlı A. Umurbaba Dağı (Eşme-Uşak) ve Çevresindeki Bazı Bitkilerin Mahalli Adları ve Etnobotanik Özellikleri, Ot Sistematik Botanik Dergisi, 2004; 11. 2: 147-154.

[32] Tuzlacı E, 2005. Bodrum'da Bitkiler ve Yaşam, Ali Rıza Baksan Güzel Sanatlar Matbaası A.Ş., İstanbul.

[33] Kargıoğlu M, Cenkci S, Serteser A, Evliyaoğlu N, Konuk M, Kök M.Ş, Bağcı Y. An Ethnobotanical Survey of Inner-West Anatolia, Turkey, Hum. Ecol. 2008; 36: 763-777.

[34] Kızılarslan Ç. İzmit körfezinin güney kesiminde etnobotanik bir araştırma, İstanbul Üniversitesi Sağlık Bilimleri Enstitüsü, Farmasötik Botanik Anabilim Dalı, Yüksek Lisans Tezi 2008.

[35] Sezik E, Tabata M, Yesilada E, Honda G, Goto K, Ikeshiro Y. Traditional medicine in Turkey in folk medicine in North-east Anatolia. J. Ethnopharmacol. 1991; 35:191-196.

[36] Ertug F. Wild edible plants of the Bodrum area (Mugla, Turkey). Turk. J. Bot. 2004; 28: 161-174.

[37] Tuzlaci E, Tolon E. Turkish folk medicinal plants, part III: sile (Istanbul). Fitoterapia. 2000; 71: 673-685.

[38] Özgökçe F, Ozcelik H. Ethnobotanical aspects of some taxa in East Anatolia (Turkey). Econ. Bot. 2004; 58: 697-704.

[39] Simsek I, Aytekin F, Yesilada E, Yildirimli S. An ethnobotanical survey of the Beypazari, Ayas, and Gudul county towns of Ankara province (Turkey). Econ. Bot. 2004; 58: 705-720

[40] Özkan A.M.G, Koyuncu M. Traditional medicinal plants used in pinarbasi area (Kayseri -Turkey). Turk. J. Pharm. Sci. 2005; 2: 63-82.

[41] Akgul G. Local names and ethnobotanical features of some wild plants of Çildir (Ardahan) and its vicinity. Herb J. Syst. Bot. 2008; 14: 75-88.

[42] Koyuncu O, Yaylaci O.K, Tokur S. A study on Geyve (Sakarya) and its environs in terms of ethnobotanical aspects. Herb J. Syst. Bot. 2009; 16: 123-142.

[43] Cansaran A, Kaya Ö.F. Contributions of the ethnobotanical investigation carried out in Amasya county of Turkey (Amasya center, baglarustu, bogakoy and Vermis villages; yassiçal and ziyaret towns). Biol. Divers. Conserv. 2010; 3: 97-116.

[44] Polat R, Satil F. Havran ve Burhaniye (Balikesir) Yörelerinde Etnobotanik Arastirmalari, TUBA Kultur Envant. Dergisi 2010; 8: 65-100.

[45] Polat R, Satil F. An ethnobotanical survey of medicinal plants in Edremit Gulf (Balikesir -Turkey).J. Ethnopharmacol. 2012; 139: 626-641.

[46] Bulut G. Folk medicinal plants of Silivri (Istanbul Turkey). Marmara Pharm. J. 2011;15: 25-29.

[47] Çakılcıoğlu U, Khatun S, Türkoğlu I, Hayta S. Ethnopharmacological survey of medicinal plants in Maden (Elazig-Turkey). J. Ethnopharmacol. 2011; 137: 469-486.

[48] Gunes F, Özhatay N., An ethnobotanical study from Kars (Eastern) Turkey. Biol. Divers. Conserv. 2011; 4: 30-41.

[49] Sarı A. O. Bilgin, O, Bilgiç A, Nedret T, Güvensen A, Şenol S. G. Ege ve Güney Marmara bölgelerinde halk ilacı olarak kullanılan bitkiler. Anadolu Ege Tarımsal Araştırma Enstitüsü Dergisi, 2010; 20.2: 1-21.

[50] Koyuncu O, Yaylaci O, Öztürk D, Potoglu Erkara I, Savaroglu F, Akcoskun O, Ardic M. Risk categories and ethnobotanical features of the Lamiaceae taxa growing naturally in Osmaneli(Bilecik/Turkey) and environs. Biological Diversity and Conservation, 2010; 3.3; 31-45.

[51] Altay V, Çelik O. Antakya semt pazarlarındaki bazı doğal bitkilerin etnobotanik yönden araştırılması. Biyoloji Bilimleri Araştırma Dergisi, 2011; 4.2:137-139.

[52] Altay V, Karahan F. Tayfur Sökmen Kampüsü (Antakya-Hatay) ve çevresinde bulunan bitkiler üzerine etnobotanik bir araştırma. Karadeniz Fen Bilimleri Dergisi. 2012; 2.7: 13-28.

[53] Polat R, Cakilcioglu U, Ertug F, Satil F. An evaluation of ethnobotanical studies in Eastern Anatolia. Biological Diversity and Conservation, 2012; 5(2): 23-40.

[54] Sargın S. A, Selvi S, Erdoğan E. The handling characteristics of the medicinal plants which sold in herbalists in Alaşehir (Manisa) region. Biodicon, 2014; 6.3: 40-45.

[55] Kultur Ş. An ethnobotanical study of Kırklareli (Turkey). Phytol. Balcan. 2008; 142: 279-289.

[56] Melikoğlu G, Kurtoğlu S, Kültür Ş. Türkiye'de astım tedavisinde geleneksel olarak kullanılan bitkiler Türkiye'de astım tedavisinde geleneksel olarak

kullanılan bitkiler. Marmara Pharmaceutical Journal 2015; 19:1-11.

[57] Erbay M.Ş, Anıl S, Melikoğlu G. Plants used in traditional treatment against anemia in Turkey Marmara Pharmaceutical Journal. 2016; 20.2: 164-171.

[58] Günbatan T, Gürbüz İ, Özkan A. M. G. The current status of ethnopharmacobotanical knowledge in Çamlıdere (Ankara, Turkey). Turkish Journal of Botany, 2016; 40.3: 241-249

[59] Akan H, Bakır Sade Y. Investigation of The Etnobotanical Aspects The Town Kâhta and Village of Narince (Kâhta (Adıyaman) Merkezi ve Narince Köyü'nün Etnobotanik Açıdan Araştırılması) BEU Journal of Science 2015; 4.2: 219-248.

[60] Albayrak N.B. An Ethnobotanical research in Orhaneli and Büyükorhan disricts (Bursa). T.C. Bursa Uludağ Üniversitesi Fen Bilimleri Enstitüsü, Biyoloji Anabilim Dalı, MSc. Thesis p: 204. 2019.

[61] Özhatay N, Akalın E, Ecevit Genc G, Kültür Ş. Ethnomedicinal uses of the wild vascular plants from European Turkey (Turkish Thrace), Plant, fungal and habitat diversity investigation and conservation Proceedings of IV Balkan Botanıcal Congress Sofia; 20–26 June 2006. (Edited by Daniella Ivanova) Institute of Botany, Bulgarian Academy of Sciences, 2009: 613-623.

[62] Güneş S, Savran A, Paksoy M.Y, Koşar M, Çakılcıoğlu U. Ethnopharmacological survey of medicinal plants in Karaisalı and its surrounding (Adana-Turkey), Journal of Herbal Medicine 2017; 8: 68–75

[63] Bulut G, Tuzlacı E, Doğan A, Şenkardeş İ. An ethnopharmacological review on the Turkish Apiaceae species. İstanbul Ecz. Fak. Dergi. / J. Fac. Pharm. Istanbul 2014; 44.2:163-179

[64] Deniz L, Serteser A, Kargıoğlu M. Local Names and Ethnobotanical Features of Some Plants in Usak University (Usak) and Its Near Vicinity. AKÜ Fen Bilimleri Dergisi 2010; 01: 57-72.

[65] Nadiroğlu M, Behçet L. Traditional food uses of wild plants among the Karlıova (Bingöl-Turkey), International Journal of Nature and Life Sciences (IJNLS) 2018; 2.2: 57-71.

[66] Karakurt E. Kelkit (Gümüşhane) İlçesinin Etnobotanik Özellikeri, Erzincan Üniversitesi Fen Bilimleri Enstitüsü, (Ethnobotany fatures of Klekit (Gümüşhane) Town. Erzincan University İnstute of Sciences. Department of Biology MsC thesis, p: 174. 2014.

[67] Korkmaz M, Alpaslan Z. Ergan Dağı (Erzincan-Türkiye)'nın Etnobotanik özellikleri / Bağbahçe Bilim Dergisi. 2014; 1. 3: 1-31.

[68] Dalar A, Konczak İ. Botanicals from Eastern Anatolia Region of Turkey: Antioxidant capacity and phenolic constituents of endemic herbal medicines, Journal of Herbal Medicine. 2012; 2:126-135.

[69] Cansaran A, Kaya Ö.F. Amasya Merkez ilçe, Bağlarüstü, Boğaköy ve Vermiş Köyleri ile Yassıçal ve Ziyaret Beldeleri Etnobotanik Envanteri 2005. TÜBA Kültür Envanteri Dergisi 2006; 5: 135-170.

[70] Şenkardeş İ. In southern districts (Acıgöl, Derinkuyu, Gülşehir, Nevşehir-Central Dıstrict, Ürgüp) of Nevşehir. Marmara Üniversitesi Sağlık Bilimleri Enstirüsü), Ph D. Thesis İstanbul, p:430. 2014.

[71] Şenkardeş İ, Tuzlacı E. Some Ethnobotanical Notes from Gündoğmuş

District (Antalya/TurkeyMÜSBED; 2014; 4.2:63-75.

[72] Bağcı Y, Erdoğan R, Doğu S. Sarıveliler (Karaman) ve Çevresinde Yetişen Bitkilerin Etnobotanik Özellikleri Selçuk Üniversitesi Fen Fakültesi Fen Dergisi 2016; 42.1: 84-107.

[73] Kaval I, Behçet L, Cakilcioglu U. Ethnobotanical study on medicinal plants in Geçitli and its surrounding (Hakkari-Turkey), Journal of Ethnopharmacology 2014; 155: 171–184.

[74] Behçet L, Arık M. An Ethnobotanical Investigation in East Anatolia (Turkey) Tr. Doğa ve Fen Derg. – Tr. J. Nature Sci. 2013; 2.1: 1-14.

[75] Polat R. Ethnobotanical study on medicinal plants in Bingol (City center) (Turkey), Journal of Herbal Medicine. 2019; 16:1-11

[76] Hoşcan N, Zenginbal H. Mudurnu'da Sürdürülebilir Turizm Gelişiminde Etnobotanik, Black Sea Journal of Engineering and Science 2020; 3.4: 151-159.

[77] Aydın A, Yeşil Y. İkizce (Ordu-Türkiye) ilçesinde etnobotanik bir ön çalışma. An ethnobotanical preliminary study in İkizce (Ordu-Turkey) district. Bağbahçe Bilim Dergisi, 2018; 5.3:25-43. doi: 10.30796/ANGV.2018.11

[78] Akalın E, Alpınar K. An investigation on medicinal and edible wild plants of Tekirdağ, Ege Universitesi, Eczacılık Fakültesi Mecm. 1994; 2.1: 1-11.

[79] Karakurt E. Kelkit (Gümüşhane) İlçesinin Etnobotanik Özellikleri, (Etnobotany Fatures of Kelkit (Gümüşhane) Town), Erzincan University, Graduate School of Natural and Applied Sciences, Department of Biology. Master Thesis, p:174. 2014.

[80] Duran A. Akseki (Antalya) ilçesindeki bazı bitklerin yerel adları ve etnobotanik özellikleri, OT Sistematik Botanik Dergisi 1998; 5.1: 77-92.

[81] Sargın S.A. Agricultural Biodiversity and Etnobotanical Survey of Alaşehir (Manisa) and Its Surrounding Area (in Turkish). Ph. D Thesis, Balıkesir University, Institute of Science, Biology. Balıkesir, p: 461. 2013.

[82] Bulut G, Tuzlacı E. An ethnobotanical study of medicinal plants in Turgutlu (Manisa—Turkey) Journal of Ethnopharmacology 2013; 149:633–647.

[83] Arı S, Temel M, Kargıoğlu M, Konuk M. Ethnobotanical survey of plants used in Afyonkarahisar-Turkey. Journal of ethnobiology and ethnomedicine, 2015; 11.1: 1-15. doi. 10.1186/s13002-015-0067-6

[84] Arı S., Ethnobotanical properties of plants used by people in Afyonkarahisar and around. Afyon Kacatepe University, Graduate School of Natural and Applied Sciences, Department of Molecular Biology and Genetics, PhD thesis, p:212. 2014.

[85] Tetik F, Civelek Ş, Çakılcıoğlu U. Traditional uses of some medicinal plants in Malatya (Turkey). J Ethnopharmacol. 2013; 146:331-346.

[86] Bozyel M.E, Bozyel-Merdamert E, Benek A, Turu D, Yakan M.A, Canlı K. International Journal of Academic and Applied Research. 2020; 4.5: 78-87.

[87] Gençler Özkan A. M, Koyuncu M. Traditional medicinal plants used in Pınarbaşı area (Kayseri-Turkey). Turkish Journal of Pharmaceutical Sciences. 2005; 2.2:63-82.

[88] Mükemre M. Konalga, Sırmalı, Dokuzdem köyleri (Çatak-Van) ve çevrelerinin etnobotanik özellikleri, Yüzüncü Yıl Üniversitesi Fen Bilimleri Enstitüsü, Biyoloji Anabilim Dalı, Yüksek Lisans Tezi, Van 2013.

[89] Polat R. Agricultural biodiversity and ethnobotanical research in the Havran and Burhaniye regions of Balıkesir. Balıkesir University, Institute of Sciences, Department of Biology; PhD. Thesis, Balıkesir. p:334. 2010.

[90] Kadıoglu Z, Cukadar K, Kalkan N. N, Vurgun H, Kaya Ö. Wild edible plant species used in the Ağrı province, eastern Turkey. Anales del Jardín Botánico de Madrid. 2020; 77.2: e098. h ttps://doi.org/10.3989/ajbm.2554

[91] Eksik C. Mardin ili Artuklu Ömerli ve Yeşilli ilçelerinin bazı köylerinde etnbotanik çalışma, (Ethnobotanic study of some villages of Artuklu, Omerli, Yesilli Districts in Mardin Province. Msc Thesis, Harran University, Garuduate School of Natural and Applied Sciences, Deparment of Biology Şanlurfa, p:211. 2020.

[92] Sargın A.A, Büyükcengiz M. Plants used in ethnomedicinal practices in Gulnar district of Mersin, Turkey. Journal of Herbal Medicine 2019; 15: 1-18; 100224

[93] Güler B, Erkan Y, Uğurlu E. Traditional uses and ecological resemblance of medicinal plants in two districts of the Western Aegean Region (Turkey), Environment, Development and Sustainability 2020; 22:2099–2120

[94] Özdemir S. Diyabakır ili aktarlarında satılan bitkiler ve etnobotanik özellikleri, Artvin Coruh Üniversitesi, Fen Bilimleri Enstitüsü, Orman Mühendisliği Ana Bilim Dalı Yüksek Lisans Tezi.p:121. 2019.

[95] Tekin S. Üzümlü (Erzincan) ilçesinin etnobotanik özellikleri, Erzincan Üniversitesi Fen Bilimleri Enstitsü, Biyoloji Anabilim Dalı, Yüksek Lisans tezi. p:126. 2011.

[96] Yapıcı İ.Ü, Hoşgören H, Saya Ö. Ethnobotanical Features of Kurtalan (Siirt) District Dicle Üniversitesi Ziya Gökalp Eğitim Fakültesi Dergisi. 2009; 12:191-196.

[97] Kurnaz Karagöz F. The evaluation of ethnobotany on the area of Suşehri (Sivas), Afyon Kocatepe University Graduate School of Natural and Applied Sciences The Department of Biology, M. Sc Thesis, p: 224. 2013.

[98] Şahin Fidan E, Akan H. Tek Tek Dağları Milli Parkı (Şanlıurfa-Türkiye) Eteklerindeki Bazı Köylerde Etnobotanik Bir Çalışma. Bağbahçe Bilim Dergisi. 2019; 6.2:64-94. E-ISSN: 2148-4015.

[99] Bağcı Y, Savran A, Dural H. Pozantı (Adana) ve Çevresindeki Bazı Bitkilerin Yerel Adları ve Etnobotanik Özellikleri, S Ü Fen Ed Fak Fen Dergisi. 2006; 2.27: 77- 82,

[100] Karakaya S, Polat A, Aksakal Ö, Sümbüllü Y.Z, İncekara Ü. An ethnobotanical investigation on medicinal plants in South of Erzurum (Turkey), Etnobotany Research Applications 2019; 18.13:1-18,

[101] Polat R, Çakılcıoğlu S, Satıl F. Traditional uses of medisinal plants in Solhan (Bingöl- Turkey). J Ethnopharmacol 2013; 148:951-63.

[102] Kültür Ş. Medicinal plants used in Kırklareli Province (Turkey). J. Ethnopharmacol. 2007; 111:341-64.

[103] Savran A, Bağcı Y, Kargıoğlu M. Gemerek (Sivas) Ve Çevresindeki Bazı Bitkilerin Yerel Adları Ve Etnobotanik Özellikleri. Afyon Kocatepe Üniversitesi Fen ve Mühendislik Bilimleri Dergisi. 2008; 8.1:313-321. Retrieved from h ttps://dergipark.org.tr/tr/pub/akufemub id/issue/1607/20068

[104] Yeşilyurt E.B, Şimşek I, Akaydın G, Yeşilada E An ethnobotanical survey in selected districts of the Black Sea region (Turkey) Turk J Bot 2017; 41:47-62.

[105] Ünver A. Lamas çayı çevresindeki köylerde (Erdemli, Silike/Mersin) etnobotanik araştırmalar, Etnobatany reseach in the villages around Lamas rtream (Erdemli/Silifke-Mersin), Balıkesir Üniversity, Instute of Science, Deparment of Biology. Msc Thesis, Balıkesir. p:195. 2019.

[106] Oymak E. Bozova (Şanlıurfa) Halkının Kullandığı Doğal Bitkilerin Etnobotanik Özellikleri. Harran Üniversitesi Fen Bilimleri Enstitüsü, Yüksek Lisans Tezi. 2018.

[107] Doğan G, Bağcı E. Elazığ'ın Bazı Yerleşim Alanlarında Halkın Geleneksel Ekolojik Bilgisine Dayanarak Kullandığı Bitkiler ve Etnobotanik Özellikleri, Fırat Üniv. Fen Bilimleri Dergisi. 2011; 23.2: 77-86.

[108] Poyraz Kayabaşı N, Tümen G, Polat R. Ethnobotanical studies on useful plants in Manyas (Balıkesir/ Turkey) region. Biological Diversity and Conservation 2016; 9.3: 58-63.

[109] Ezer N, Avcı K. Çerkeş (Çankırı) Yöresinde Kullanılan Halk İlaçları, Hacettepe Üniversitesi Eczacılık Fakültesi Dergisi.2004; 2:67-80.

[110] Koyuncu O, Yaylacı K, Tokur S, Geyve (Sakarya) ve Çevresinin Etnobotanik Açıdan İncelenmesi; OT Sistematik Botanik Dergisi, 2009; 16.1: 123-142. ISSN: 1300-2953.

[111] Aktan T, Altan Y. Yenişehir (Bursa) mezarlıklarının doğal süs bitkileri, C.B.Ü. Fen Bilimleri Dergisi: 2011; 7.2: 31- 39.

[112] Doğan A, Tuzlacı E. Wild Edible Plants of Pertek (Tunceli-Turkey), Marmara Pharmaceutical Journal 2004; 19: 126-135, 2015 doi: 10.12991/ mpj.20151910459.

[113] Koca A.D, Yıldırımlı Ş. Ethnobotanical properties of Akçakoca district in Düzce (Turkey); Hacettepe journal of biology and chemistry. (Hacettepe J. Biol. & Chem) 2010; 38.1: 63-69.

[114] Yeşil Y, İnal İ. Traditional knowledge of wild edible plants in Hasankeyf (Batman Province, Turkey). Acta Soc Bot Pol. 2019; 88.3:3633 h ttps://doi. org/10.5586/asbp.3633.

[115] Saraç D.U, Özkan Z.C, Akbulut S. Ethnobotanic features of Rize/Turkey province, Biological Diversity and Conservation. 2013; 6.3:57-66.

[116] Polat R. Ethnobotanical study on medicinal plants in Bingol (City center) (Turkey), Journal of Herbal Medicine, 2019; 16: 1-11

[117] Kocabaş Z. Y, Gedik O. Kahramanmaraş İl Merkezi Semt Pazarlarında Satılan Bitkiler Hakkında Etnobotanik Araştırmalar Iğdır Üni. Fen Bilimleri Enst. Der. / Iğdır Univ. J. Inst. Sci. & Tech. 2016; 6.4: 41-50.

[118] Furkan M.K. The ethnobotanical propertiess of some plants growing in Adıyaman, Adıyaman University, Graduate School of Natural and Applied Sciences, Department of Biology. M.Sc thesis p:250. 2016.

[119] Baytop, T. Türkçe Bitki Adları Sözlüğü, Atatürk Kültür, Dil ve Tarih Yüksek Kurumu, Türk Dil Kurumu Yayınları: 578, Ankara, 1997.

[120] Hürkul M.M, Köroğlu A. Etnobotanik bir derleme: Amygdaloidea (Rosaceae) alt familyası, FABAD J. Pharm. Sci. 2019; 44.1: 35-46.

[121] Aslan S, Akan H, Pekmez H. The Ethnobotanical investigation of Yaslıca town and Arıkök neighborhood (Şanlıurfa/Turkey). Biological Diversity and Conservation. 2020; 13.1:44-61, doi: 10.46309/biodicon.2020.730293.

[122] Elçi B, Erik S. Güdül (Ankara) ve çevresinin etnobotanik özellikleri,

Hacettepe Üniversitesi, Eczacılık Fakültesi Dergisi. 2006; 26.2:57-64.

[123] Batı Erdem C. Abbaslık köyü (bilecik) florası ve etnobotanik özellikleri (The Flora and Ethnobotany af Abbaslık village (Bilecik), Hacettepe University, İnstute of Science, Department of Biology, M.Sc. Thesis. p: 113. 2018.

[124] Güzel Y, Güzelşemme M, Miski M. Ethnobotany of medicinal plants used in Antakya: A multicultural district in Hatay Province of Turkey, Journal of Ethnopharmacology 2015; 174:118–152.

[125] Yıldırım M.U., Sarıhan E.O., Khawar K.M., 2020. Ethnomedicinal and Traditional Usage of Saffron (*Crocus sativus* L.) in Turkey, Saffron the Age-Old Panacea in a New Light (ed: Sarwat M., Sumaiya S.), part I, chapter 2; pp: 21-31, Elsevier, Academic Press, ISBN: 978-0-12-818462-2

[126] Yildirim M.U. In Vitro Plant Regeneration and Antibacterial Activities of Gentiana lutea – An Endangered Medicinal Plant Species. Fresenius Environmental Bulletin. 2019; 28.7:5070-5074.

[127] Muminjanov H, Karagöz A. Biodiversity of Turkey, Contribution of Genetic Resources to Sustainable Agriculture and Food Systems. In: Genetic Resources of Medicinal and Aromatic Plants. 5th ed. Food and Agriculture Organization of the United Nations. Ankara, 2018. p.73-90. ISBN 978-92-5-130959-9©FAO

[128] Ödemiş ve Bozdağ Yöresi Yerel Bilgeliği, Yerel Bilgilerin İzinde [Internet]. 2008. Available from: http://nazimtanrikulu.com/?pnum=36&pt=%C3%96demi%C5%9F+ve+Bozda%C4%9F+Y%C3%B6resi+Yerel+Bilgeli%C4%9Fi

[129] Genç, G.E, Ozhatay N. An ethnobotanical study from European part of Istanbul (Catalca) in Turkey I. – Istanbul Univ. Eczac. Fak. Mecm., 2004; 37: 67-74.

[130] Genç G.E, Ozhatay N. An ethnobotanical study in Catalca (European Part of Istanbul) II. – Turk. J. Pharmaceut. Sci., 2006; 3.2: 73-89.