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ORIGINAL RESEARCH PAPER

Traditional knowledge of wild edible plants of Iğdır Province (East Anatolia, Turkey)

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* Email: ernazaltundag@duzce.edu.tr**Abstract**

Iğdır Province is situated in the Eastern Anatolian Region of Turkey. Wild edible plants and their utilization methods have not been previously documented there. This study was conducted during an ethnobotanical survey of Iğdır Province from 2007 to 2012, in the period from May to October, when plants were in their flowering and fruiting periods. There were 210 interviews carried out in 78 villages. This study provides information about 154 wild plant taxa belonging to 27 families that have been used as foodstuffs, spices, or hot drinks. Seventeen wild edible plants were recorded for the first time during this study. Eight endemic species were reported as used for their edibility, and new local names for plants were also recorded. The cultural importance index was calculated for each taxon. The most culturally important species are *Mentha longifolia*, *Falcaria vulgaris*, *Polygonum aviculare*, *Rosa canina*, *Crataegus azarolus*, *Capsella bursa-pastoris*, and *Malus sylvestris*. This study presents the richest heritage in terms of the diversity of wild edible plants ever recorded in Turkey.

Keywords

ethnobotany; wild edible plants; Iğdır; East Anatolia; Turkey

Introduction

Plants are the main resource which humans use to maintain their existence on Earth, and they have been used in every aspect of life. The use of plants is not limited to documented literature, much knowledge is still accessible in traditional daily life in Turkey. In this regard, there is an ongoing effort in the ethnobotany field to discover the usage of plants. Wild plants are still waiting for studies to be conducted on them, especially, have great potential to be beneficial in all dimensions of life: medicine, food, clothing, etc. Hence, through ethnobotanical investigations we can discover new possibilities for our future, arising from our unwritten memory.

There are 8796 species in the *Flora of Turkey* (excluding an additional 192 species of the East Aegean Islands) [1–3]. According to the last checklist, additional 945 species were added to the *Flora of Turkey* [4]. The rate of endemism is about 34% [1]. Due to the impact of floristic richness and cultural diversity in Anatolia, many ancient civilizations started to cultivate many food and medicinal plants in this area [5].

Studies on ethnomedicine have gradually developed since 1945 in Turkey [6]. In recent years, ethnobotanical studies have aroused attention among researchers in Turkey as well [5,7–68]. When the contents of ethnobotanical studies are examined, it may be seen that there is an intense usage of medicinal plants; food plants are less frequently used. In Turkey, there is an important history of gathering plants for food, and the public, especially, satisfy their needs from the forests and mountains on their own. This traditional approach still exists in rural areas. The aerial parts or roots of many wild plants are used as vegetables, which are eaten raw or cooked, as well as being consumed through drying or pickling [69].

There has been some research on edible plants in Turkey already published [14–18, 23,29,35,37,38,51,66]. This study was conducted in Iğdır Province, which has a rich cultural heritage and different habitats, in order to survey and record local people's knowledge of wild plants that are used for nourishment. There are only two publications about the medicinal plants of Iğdır [5,58]. There has been no investigation of its wild edible plants. This study aims to describe the use of wild edible plants by folk in the Iğdır Province.

Material and methods

Study area

Iğdır Province is located in the Erzurum-Kars part of the Eastern Anatolian region of Turkey (Fig. 1). It is comprised of four districts (Central, Tuzluca, Aralık, Karakoyunlu) and 156 villages. Its area covers 3539 km² and the elevation of its land varies from 795 to 5165 m a.s.l. Iğdır is composed of 74% mountains and high plateaus and 26% lowlands. Its total population is about 192 000 (2014) [70,71].

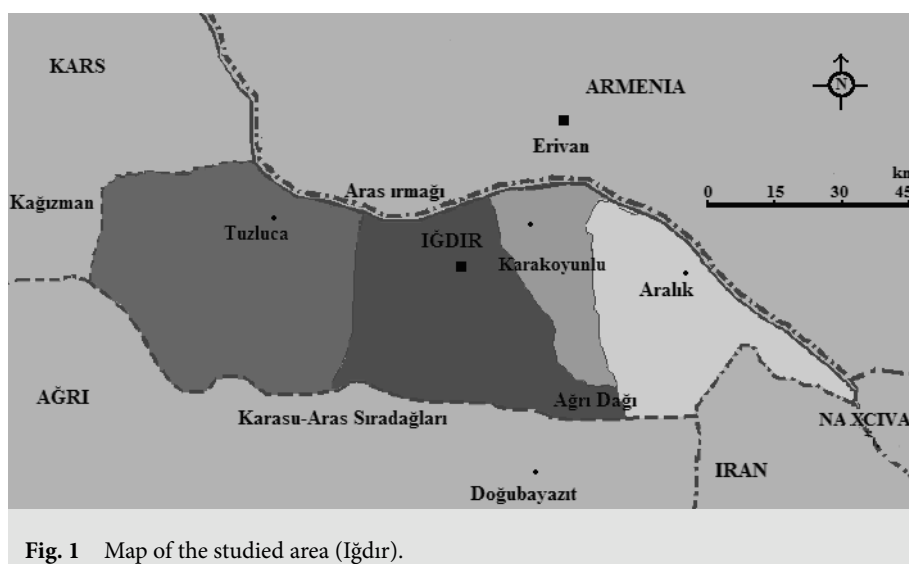


Fig. 1 Map of the studied area (Iğdır).

The province is located near Mount Ararat, which is the largest and highest volcanic mountain of Turkey (5165 m). What is more, it includes Aras valley, which has an altitude of 800–900 m (Fig. 2). The Iğdır plain has a microclimatic zone. Owing to its microclimate and loamy soils, Aras valley is convenient for growing many kinds of vegetables and fruits [71]. The neighboring countries of Turkey in this area are Iran, Armenia, and Azerbaijan (Nakhichevan).

The main sources of livelihood are agriculture, in villages on the plain, and animal husbandry in mountain villages. The main crops of Iğdır are apricot, sugar beet, and wheat. Beekeeping is also a potentially good income source in Iğdır [70,71].

This study, aimed at determining the traditional uses and common names of the wild edible plants in Iğdır Province, was carried out from May 2007 to October 2012. Visits to the area consisted of several periods from 5–18 days in a year. There are 156 villages in the province. Seventy-eight villages were studied, most of which were specifically selected mountain villages, far away from the center of Iğdır, and border villages.

Plant material

During the research, a total of 780 plant specimens were collected with the help of the local people consulted. The collected plant specimens were kept in ISTE (The Herbarium



Fig. 2 General view of a village and Mount Ararat.

of the Istanbul University, Faculty of Pharmacy). These specimens were basically identified with the *Flora of Turkey* [1–3] and other *Floras* of bordering countries [72,73]. Scientific plant names were checked by using The Plant List website [74].

Interviews with local people

A questionnaire was presented to the local people face to face, comprising the following questions:

1. Name and surname of the informant
2. Age and sex of the informant
3. Telephone number and address
4. Date of interview
5. Which kind of wild vegetables/fruits have you collected?
6. Which parts have you collected?
7. How do you consume it?

Information about the plants, such as local names, usages, used parts, and methods of preparation, etc., were recorded.

A total of 210 interviews were conducted with 127 female and 83 male participants, including both elderly and young people (Fig. 3). During the study, after general observation, the people approved by the villagers as consultants and authorities on plant use were selected for the interviews. The mean age of the respondents was 47 years (from a range of 23–95). Interviews were carried out in their houses, in fields, bazaars, and tea houses. The informants were visited at least twice per study. Taxa with less than two responses were not considered.

The main ethnicity, as ascertained in the interviews, is Azerbaijani Turkish and the second largest ethnic group are Kurdish people. Most people interviewed were Azerbaijani Turkish people, due to their long history in the region.

Data analysis

The cultural importance index (CI) [75,76] was calculated for each taxa according to the following formula:

$$CI = \sum_{i=1}^{i=NU} \frac{UR_i}{N}$$



Fig. 3 A woman collecting fresh shoots of *Urtica dioica*.

The index was obtained by adding the *UR* (use report) in every use category (*i*, varying from only one use to total number of uses, *NU*) mentioned for a taxon divided by the number of informants in the survey (*N*). This is a quantitative method that demonstrates the prominence of species known locally. The theoretical maximum value of the index is the total number of different use categories [75].

Results

Within the scope of the study, following the identification of the plant specimens, 154 taxa were determined. Among them, 132 taxa are used as food, seven taxa as food and tea, four taxa as food and spices, and 11 taxa as spices and tea. The wild edible plants with their family names,

herbarium numbers, vernacular names, edible parts, utilization methods, cultural importance index, and previous use records in the literature are presented in [Tab. 1](#), in alphabetical order of their scientific names. The most common families are Asteraceae (24 taxa), Apiaceae (19 taxa), Lamiaceae (13 taxa), Boraginaceae (12 taxa), Polygonaceae (10 taxa), Fabaceae (nine taxa), Brassicaceae (eight taxa), Rosaceae (eight taxa), Asparagaceae (eight taxa), Ranunculaceae (six taxa), and Amaryllidaceae (six taxa). The genera with high ranking in the taxa ordering for the province are the following; *Allium* with six taxa, *Rumex* with five taxa, *Thymus* with five taxa, *Trifolium* with five taxa, *Polygonum* with four taxa, *Ranunculus* with four taxa, *Salvia* with four taxa, *Scorzonera* with four taxa, and *Tragopogon* with four taxa.

The edible parts of plants are leaves (31.2%), aerial parts (29.2%), stems (17.5%), flowers (15.4%), fruits (9.7%), roots (7.1%), tubers, corms, or bulbs (6.5%), petioles (3.2%), and seeds (1.9%).

Most of the edible plants are used as wild vegetables, and they are collected in spring. 71 taxa are used raw (46.1%), 47 taxa are used in cooking (30.5%), and 36 are used both raw and cooked (23.4%). Some of the culinary usages with regard to raw and cooked consumption of the wild taxa are detailed below.

Raw consumption

Wild vegetables are commonly consumed raw in Iğdır Province. They are usually weeds growing in fields, on grasslands and sometimes by roadsides, and mostly collected in spring (April–May). People commonly use them in salads or snacks. Aerial parts or leaves of *Achillea tenuifolia*, *Capsella bursa-pastoris*, *Cardamine uliginosa*, *Ornithogalum* species, *Podospermum* species, *Prangos ferulacea*, *Puschkinia scilloides*, and *Scorzonera* species are consumed as salad. *Achillea tenuifolia* is not only a common wild vegetable but it is also used as a medicinal plant and sold in open markets in spring. Local people in mountain villages collect and consume some of the wild vegetables as appetizers. *Allium*, *Rumex*, and *Tragopogon* species, especially, are eaten as snacks. The nectar of Boraginaceae flowers (e.g., *Echium*, *Nonea*, and *Onosma* species) are sucked as a snack, especially by children.

There are many kinds of wild fruits, and people collect and consume them fresh or dried, especially in summer. Fruits of *Berberis* species, *Chenopodium foliosum*, *Cotoneaster integerrimus*, *Crataegus* species, *Elaeagnus angustifolia*, *Malus sylvestris*, *Rosa* species, and *Viburnum lantana* are eaten. Flowers of *Iris* and *Trifolium* species are also eaten, mostly by shepherds, as snacks ([Tab. 1](#)).

Tab. 1 List of wild plants used as foodstuffs in Iğdır Province.

Scientific name and family; herbarium number (ISTE)	Local names	Edible parts	Utilization method	CI	Previous ethnobotanical literature records in Turkey
<i>Achillea tenuifolia</i> Lam. (Asteraceae); 85519	Çobankirpiği	Leaves	Eaten raw, as salad, cooked with yoghurt	0.96	M [5]
<i>Alcea striata</i> (DC.) Alef. subsp. <i>rufescens</i> (Boiss.) Cullen (Malvaceae); 85534	Gülçiçek	Fruit	Eaten raw, as hot drink	1.26	M [5]
<i>Alkanna orientalis</i> (L.) Boiss. (Boraginaceae); 85284	Sormuk	Flowers	Its nectar sucked	0.23	M [5,6,27]; D [6]
<i>Allium armenum</i> Boiss. & Kotschy (Amaryllidaceae); 85600	Silim soğanı	Leaves	Eaten raw	0.23	F [39]; M [5]
<i>Allium atroviolaceum</i> Boiss. (Amaryllidaceae); 85867	Silim soğanı	Leaves	Eaten raw	0.41	F [6,22,26,42]; M [5]
<i>Allium cardiostemon</i> Fisch. & C. A. Mey. (Amaryllidaceae); 85530	Silim soğanı	Leaves	Eaten raw	0.52	F [32,39,42,47]
<i>Allium flavum</i> L. (Amaryllidaceae); 85733	Silim soğanı	Leaves	Eaten raw	0.42	Not reported
<i>Allium rotundum</i> L. (Amaryllidaceae); 84421	İt soğanı	Leaves	Eaten raw	0.95	F [6,27,33,35,40,60,65]; M [5,32,44,55]; FD [22]
<i>Allium subakaka</i> Razafard & Zarre (Amaryllidaceae); 84598	Dana soğanı	Bulbs	Eaten raw, cooked	0.27	F [6,26,35,42,47]; M [5]
<i>Amaranthus retroflexus</i> L. (Amaranthaceae); 85516	Bozoğlan	Aerial parts	Cooked with yogurt and bulgur, roasted with onion or egg, added to pie	1.14	F [10,14–16,22,23,40,51,67]; M [5,36,46,50,53]
<i>Anchusa azurea</i> Miller var. <i>kurdica</i> (Guşul.) D. F. Chamb. (Boraginaceae); 84455	Çıtdayış	Aerial parts	Eaten raw	0.52	F [7,10,14–16,22,27,35,43,51,59,67]; M [5,12,30,32,36,41,48–50,55,60,62,68]; FD [7]; D [48]
		Flowers	Its nectar sucked	0.26	
<i>Anthriscus nemorosa</i> (M. Bieb.) Spreng. (Apiaceae); 85638	Zire	Aerial parts	Cooked with yogurt and bulgur, eaten fresh, as pickled	0.33	F [27,42,47]; M [5]
		Stem	Eaten raw after bark is peeled	0.2	
<i>Anthriscus sylvestris</i> (L.) Hoffm. (Apiaceae); 85602	Zire	Aerial parts	Cooked with yogurt and bulgur, eaten raw	0.24	F [42,47]; M [5,6]
		Stem	Eaten raw after bark is peeled	0.18	
<i>Arctium platylepis</i> (Boiss. & Bal.) Sosn. ex Grossh. (Asteraceae); 85773	Garahort	Leaves	Stuffed	0.6	F [18]; M [5]
		Root	Eaten raw after bark is peeled	0.53	
		Stem	Eaten raw after bark is peeled	0.48	

Tab. 1 Continued

Scientific name and family; herbarium number (ISTE)	Local names	Edible parts	Utilization method	CI	Previous ethnobotanical literature records in Turkey
<i>Artemisia austriaca</i> Jacq. (Asteraceae); 85796	Darhun	Leaves	As spice	0.25	M [5]
<i>Asparagus persicus</i> Baker (Liliaceae); 85292	Mereçöyüt	Shoots	Boiled then roasted with egg, cooked as soup, cooked with yogurt	0.65	FD [22]
<i>Bellevalia paradoxa</i> (Fisch. & C. A. Mey.) Boiss. (Asparagaceae); 84409	Aşpenceri	Leaves	Cooked with wheat and milk	0.2	Not reported
<i>Bellevalia speciosa</i> Woronow ex Grossh. (Asparagaceae); 84404	Yağlıca	Leaves	Cooked with milk and rice	0.23	F [28]
<i>Berberis crataegina</i> DC. (Berberidaceae); 84592	Zirinç	Fruit	Eaten fresh or dried	0.80	F [6,9,14,21,22,33,60,61,67]; M [5,10,11,22,24,31,38,44,60,66,68]
		Leaves	Eaten raw	0.59	
<i>Berberis vulgaris</i> L. (Berberidaceae); 85744	Zirinç	Fruit	Eaten fresh or dried	0.85	F [6,45]; M [5,36,44,46,48,62]; D [48]
		Leaves	Eaten raw	0.53	
<i>Beta corolliflora</i> Zosimović ex Butler (Amaranthaceae); 85736	Gızılca	Aerial parts	Boiled then roasted with egg	0.61	M [5,58]
<i>Bunias orientalis</i> L. (Brassicaceae); 85601	Galatürpenk	Stem	Eaten raw after bark is peeled	0.13	M [5]
<i>Bunium paucifolium</i> DC. (Apiaceae); 85470	Goçguzu	Tuber	Eaten raw after bark is peeled	0.12	F [43,47]; M [12]
<i>Caltha palustris</i> L. (Ranunculaceae); 84471	Lulpar	Petioles	Boiled and eaten with yogurt	0.6	F [18,28]; M [5,6,28]; D [47]
<i>Capsella bursa-pastoris</i> (L.) Medik. (Brassicaceae); 84547	Kuşeppeği	Aerial parts	Eaten raw, as a salad, cooked, as hot drink	1.6	F [7,9,10,15,16,22,23,27,28,37,38,40,47,51,59,60,67]; M [5,6,12,24,30,32,36,44,49,50,52,53,56,62,64]; FD [14,31]
<i>Cardamine uliginosa</i> M. Bieb. (Brassicaceae); 84554	Tere	Aerial parts	Eaten raw, as salad, cooked with yogurt	1.31	F [16,23,35]; M [5,64]
<i>Carduus nutans</i> L. (Asteraceae); 85520	Şekertikanı	Stem	Eaten raw after bark is peeled	0.79	F [7,14,27,40,51,55,56,66]; M [32,60,62,68]
<i>Centaurea iberica</i> Trev. ex Sprengel (Asteraceae); 85830	Çakırdikeni	Stem	Eaten raw after bark is peeled	0.52	F [7,43,47,56]; M [5,21,30,31,58,65]
<i>Cerintho minor</i> L. subsp. <i>auriculata</i> (Ten.) Domac (Boraginaceae); 84458	Cücegözü	Aerial parts	Boiled and roasted	0.31	F [22,47]; FD [10,22]; M [31]
<i>Cerintho minor</i> L. subsp. <i>minor</i> (Boraginaceae); 85708	Cücegözü	Aerial parts	Boiled and roasted	0.29	F [14,22,43]; FD [10,22]
<i>Chaerophyllum angelicifolium</i> M. Bieb. (Apiaceae); 85581	Cacık	Aerial parts	Added into cheese	0.19	Not reported

Tab. 1 Continued

Scientific name and family; herbarium number (ISTE)	Local names	Edible parts	Utilization method	CI	Previous ethnobotanical literature records in Turkey
		Stem	Eaten raw after bark is peeled	0.11	
<i>Chaerophyllum aureum</i> L. (Apiaceae); 85765	Delimanda	Stem	Eaten raw after bark is peeled	0.2	Not reported
<i>Chenopodium album</i> L. (Amaranthaceae); 84589	Salmanca, unluca	Aerial parts	Boiled then roasted with egg, cooked as soup with yogurt and bulgur	1.20	F [9–14,16,17,22,27,28,37,38,40,43,47,51,56,59,60,66,67]; M [5,6,49,50]; FD [22]
<i>Chenopodium foliosum</i> Asch. (Amaranthaceae); 85525	Kuşüzümü	Fruit	Eaten raw	0.88	F [10,27,43,45]
		Leaves	Boiled then roasted	0.84	
<i>Chenopodium murale</i> L. (Amaranthaceae); 85510	Salmanca, unluca	Aerial parts	Boiled then roasted with egg, cooked as soup with yogurt and bulgur, made pie	1.35	F [20,56]; M [5,20]
<i>Cichorium intybus</i> L. (Asteraceae); 85514	Cızdankuş	Aerial parts	Boiled then roasted with egg	1	F [13–16,22,27,38,40,43,47,49,67]; M [5,6,10,22,24,25,27,30,33,34,41,43,46,47,49,53,55,62,63]; FD [22]
<i>Cirsium arvense</i> (L.) Scop. (Asteraceae); 85612	Hemirkesen tikanı	Stem	Eaten raw after bark is peeled	0.65	F [14–16,18,37,43,47,66]; M [5,6,49,68]
<i>Cirsium rhizocephalum</i> C. A. Meyer (Asteraceae); 85447	Keçimemesi	Root	Eaten raw after bark is peeled	0.5	F [47]
<i>Conringia orientalis</i> (L.) Dumort. (Brassicaceae); 85265	Horuztaşağı	Aerial parts	Roasted with egg	0.23	F [43,47]
<i>Convolvulus arvensis</i> L. (Convolvulaceae); 84583	Dolaşgan	Leaves	Cooked with yogurt and bulgur	0.73	F [33,35,37,38,42,43,47,60,67]; M [5,12,31,36,44,55,68]; FD [7,22]
<i>Convolvulus scammonia</i> L. (Convolvulaceae); 85704	Dolaşgan	Leaves	Cooked with yogurt	0.49	M [5]
<i>Cotoneaster integerrimus</i> Medik. (Rosaceae); 85731	Garagat	Fruit	Eaten raw	0.86	F [27]; M [5]; O [27]
<i>Crataegus azarolus</i> L. var. <i>aronia</i> L. (Rosaceae); 84573	Gurmut, hurmut	Fruit	Eaten raw, boiled to prepare jam	1.62	F [13,15,29]; M [5,30,32,50,60,62]
<i>Crataegus meyeri</i> Pojark. (Rosaceae); 85732	Gurmut, hurmut	Fruit	Eaten raw, boiled to prepare jam	1.46	F [14,22,67]; M [5,62]; FD [22]
<i>Cyanus cheiranthifolius</i> (Willd.) Sojak (Asteraceae); 84490	Perpatyan	Aerial parts	Boiled then roasted	0.21	M [5,44]
<i>Cymbocarpum anethoides</i> DC. (Apiaceae); 85495	Aşotu	Aerial parts	As spice	0.08	Not reported
<i>Diplotaxis tenuifolia</i> (L.) DC. (Brassicaceae); 84566	Türpenk	Aerial parts	Eaten fresh	0.18	M [5,6]
<i>Echinops pungens</i> Trautv. (Asteraceae); 85728	Topuz	Capitulum	Eaten fresh	0.48	F [14,22,27,28,43,46]; FD [22]

Tab. 1 Continued

Scientific name and family; herbarium number (ISTE)	Local names	Edible parts	Utilization method	CI	Previous ethnobotanical literature records in Turkey
<i>Echium italicum</i> L. (Boraginaceae); 85642	Sorma	Flowers	Its nectar sucked	0.52	F [14–16,22,44,56]; M [5,12,31,46,47,63,68]; FD [22]
<i>Echium vulgare</i> L. (Boraginaceae); 85648	Sorma	Flowers	Its nectar sucked	0.51	M [5,6]
<i>Elaeagnus angustifolia</i> L. (Elaeagnaceae); 84528	İğde	Fruit	Eaten dried	1	F [6,22,40,43,47,49,66,67]; M [5,21,30–32,44,53,62, 65,68]
<i>Eremurus spectabilis</i> Bieb. (Xanthorrhoeaceae); 84401	Çiriş	Aerial parts	Boiled and roasted	0.58	F [6,11,14,16,17,39,42,47,67]; M [5,6,12,44,50,64]
<i>Eryngium billardieri</i> Delile (Apiaceae); 85404	Buğa tikanı	Stem	Eaten raw after bark is peeled	0.58	F [6,27,28,35,43,45,47,58]; M [5,27,28,36,41,46,47,56, 58,63,68]
<i>Eryngium campestre</i> L. var. <i>virens</i> (Link) Weins (Apiaceae); 84467	Buğa tikanı	Stem	Eaten raw after bark is peeled	1	F [14–16,23,27,38,43,47,59, 60]; M [5,6,10,22,27,31,47, 49,55–57,60]; FD [33]
<i>Falcaria vulgaris</i> Bernh. (Apiaceae); 85721	Gazeyağı	Aerial parts	Cooked with yogurt or milk and bulgur, roasted with egg, pickled	2.53	F [14,16,27,35,43,47]; M [36]
<i>Ferula caspica</i> Bieb. (Apiaceae); 85446	Gırmızıpölük	Aerial parts	Boiled then roasted, pickled	0.19	M [5]
		Stem	Eaten raw after bark is peeled	0.1	
<i>Ferula orientalis</i> L. (Apiaceae); 85609	Eşekçaşırı	Leaves	As spice	0.81	F [6,42,47]; M [5,64]
<i>Ferula rigidula</i> Fisch. ex DC. (Apiaceae); 85835	Çaşır, çaşur	Leaves	Boiled and roasted	0.78	F [6,42,47]; M [5]
<i>Ficaria fascicularis</i> K. Koch. (Ranunculaceae); 85323	Mayısçiçeği	Leaves	Boiled and eaten with yogurt	0.44	F [23,37]; M [6,30,56,65]
<i>Geranium tuberosum</i> L. (Geraniaceae); 85317	Tavşantopu	Tuber	Eaten raw after bark is peeled	0.37	F [14,39]; D [45]
<i>Gladiolus atroviolaceus</i> Boiss. (Iridaceae); 85588	Papakotu	Corm	Eaten raw after bark is peeled	0.15	F [47]; M [6]
<i>Gladiolus kotschyanus</i> Boiss. (Iridaceae); 84406	Papakotu	Corm	Eaten raw after bark is peeled	0.13	Not reported
<i>Glycyrrhiza glabra</i> L. (Fabaceae); 85509	Şirinbiyan	Root	Eaten raw after bark is peeled, prepared as syrup	1.18	F [8,15,51,66]; M [5,7,8,24, 30,32,34,36,43,46–48,53,55, 58,62]; D [48]
<i>Heracleum trachyloma</i> Fisch. & Mey. (Apiaceae); 85792	Baldirğan, keküre	Leaves	Stuffed	0.83	F [18,28]; M [5,28,55]
		Stem	As spice, eaten raw after bark is peeled	1.33	
<i>Iris caucasica</i> Hoffm. (Iridaceae); 85313	Gızmemesi	Tepals	Eaten raw	0.23	F [39]; M [5,64]
<i>Iris iberica</i> Hoffm. subsp. <i>elegantissima</i> (Sosn.) Fed. Takht. (Iridaceae); 85276	Gurtgulağı	Tepals	Eaten raw	0.18	M and D [48]

Tab. 1 Continued

Scientific name and family; herbarium number (ISTE)	Local names	Edible parts	Utilization method	CI	Previous ethnobotanical literature records in Turkey
<i>Jurinella moschus</i> (Habl.) Bobrov subsp. <i>pinnatisecta</i> (Boiss.) Danin & Davis (Asteraceae); 84508	Gazangulpu	Root	Eaten raw after bark is peeled	0.15	M [5]
<i>Lathyrus rotundifolius</i> Willd. (Fabaceae); 85560	Gürül	Leaves	Eaten raw	0.49	F [28]; M [5]
		Seed	Eaten raw	0.37	
<i>Lathyrus tuberosus</i> L. (Fabaceae); 85779	Gürül	Root	Eaten raw after bark is peeled	0.5	F [6,28]; M [28]
<i>Leontodon asperrimus</i> (Willd.) Endl. (Asteraceae); 85637	Aş yemliği	Leaves	Cooked as soup	0.08	Not reported
<i>Lepidium sativum</i> L. (Brassicaceae); 85563	Tere	Aerial parts	Eaten raw	0.84	F [6,9,16,22,23,27,47]; M [5,27,53,75]; FD [22]
<i>Lepidium vesicarium</i> L. (Brassicaceae); 85303	Tereotu	Aerial parts	Cooked as soup	0.15	F and M [28]
<i>Malabaila dasyantha</i> Fisch. & C. A. Mey. ex K. Koch (Apiaceae); 85540	Kelemekeşir	Aerial parts	Cooked with yogurt and bulgur, roasted	0.27	F [27,28,47]; M [5,27]
		Root	Eaten raw after bark is peeled, as spice	0.28	
		Stem	Eaten raw after bark is peeled, as spice	0.43	
<i>Malabaila secacul</i> (Mill.) Boiss. (Apiaceae); 85643	Kelemekeşir, manda	Root	Eaten raw after bark is peeled	0.17	M [5]
		Stem	Eaten raw after bark is peeled, as spice	0.31	
<i>Malus sylvestris</i> (L.) Mill. subsp. <i>orientalis</i> (A. Uglitzkitch) Browicz var. <i>orientalis</i> (Rosaceae); 85737	Alma	Fruit	Eaten raw or dried, as hot drink	1.52	F [9,10,14,22,23,35,40,47,61]; M [5,33,41,48]; D [48]
<i>Malva neglecta</i> Wallr. (Malvaceae); 84599	Ebemkömeci	Aerial parts	Boiled and roasted	1	F [6,7,9,11,20,22,27,28,43,45,47,49,51,56,59,60,67]; M [5,10,12–14,20,25,27,28,31–36,38,41,43,44,46,47,50,53,55,56,58,62,63,65,70,71]; FD [22]
		Fruit	Eaten raw, as hot drink	0.70	
<i>Mentha longifolia</i> (L.) L. (Lamiaceae); 85771	Bung, pung, yarpız, yarpuz	Leaves	Cooked with yogurt, eaten fresh, as spice	2.76	F [11,13,14,22,27,28,33,35,37,38,40,42,44,45,47,51,56,57,60,61,67]; M [5,6,10,12,20,22,24,27,28,30,32,34,36,41,46,48,50,55,57,58,64,68]; D [48]
<i>Nonea macrosperma</i> Boiss. & Heldr. (Boraginaceae); 84456	Sorma	Flowers	Its nectar sucked	0.15	M [5]
<i>Nonea pulla</i> (L.) DC. (Boraginaceae); 84450	Sorma	Flowers	Its nectar sucked	0.22	F [35]; M [5,34,43,47]

Tab. 1 Continued

Scientific name and family; herbarium number (ISTE)	Local names	Edible parts	Utilization method	CI	Previous ethnobotanical literature records in Turkey
<i>Nonea stenosolen</i> Boiss. & Bal. (Boraginaceae); 85282	Sorma	Flowers	Its nectar sucked	0.12	Not reported
<i>Onopordum acanthium</i> L. (Asteraceae); 85826	Gangal	Root	Eaten raw after bark is peeled	0.75	F [45,56]; M [6,41,50,56]
		Stem	Eaten raw after bark is peeled	0.78	
<i>Onosma argentatum</i> Hub.-Mor. (Boraginaceae); 85554	Sorma	Flowers	Its nectar sucked	0.2	F [14]
<i>Onosma bornmuelleri</i> Hausskn. & Bornm. (Boraginaceae); 85630	Sorma	Flowers	Its nectar sucked	0.15	Not reported
<i>Onosma nigricaulis</i> Riedl (Boraginaceae); 85661	Sorma	Flowers	Its nectar sucked	0.11	Not reported
<i>Origanum vulgare</i> L. subsp. <i>gracile</i> (C. Koch) Ietsw. (Lamiaceae); 85738	Kır kekiği	Aerial parts	As spice	0.75	F [14,15,23,33,37,40,47,51,60]; M [5,6,10,12,32,36,44,46,50,55,63,64,68]
<i>Ornithogalum montanum</i> Cirillo (Liliaceae); 85599	Gurtsoğanı	Bulbs	Eaten raw	0.52	Not reported
		Leaves	Eaten raw, as salad, cooked with bulgur	0.65	
<i>Ornithogalum narbonense</i> L. (Asparagaceae); 84415	Gurtsoğanı	Bulbs	Eaten raw	0.65	F [15,43,47]
		Leaves	Eaten raw, as salad, cooked with bulgur	0.73	
<i>Ornithogalum oligophyllum</i> E. D. Clarke (Liliaceae); 84408	Gurtsoğanı	Bulbs	Eaten raw	0.59	F [43,47]; O [39]
		Leaves	Eaten raw, as salad, cooked with bulgur	0.72	
<i>Papaver lacerum</i> Popov (Papaveraceae); 85580	Haşhaş	Bud	Eaten raw	0.51	F [60]; M [5]
<i>Papaver orientale</i> L. var. <i>parviflora</i> Busch (Papaveraceae); 85679	Lale	Bud	Eaten raw	0.6	F [6,28,43,47]; M [5,28]
		Stamens	Eaten with cream	0.11	
		Young fruit	Eaten raw	0.20	
<i>Pastinaca armena</i> Fisch. & C. A. Mey. subsp. <i>armena</i> (Apiaceae); 85800	Kelemekeşir	Leaves	As spice	0.26	F [28]; M [50]
		Stem	Eaten raw after bark is peeled	0.20	
<i>Pedicularis comosa</i> L. var. <i>sibthorpii</i> (Boiss.) Boiss. (Scrophulariaceae); 85315	Sorma	Flowers	Its nectar sucked	0.23	Not reported
<i>Persicaria alpina</i> (All.) H. Gross (Polygonaceae); 84577	Elayız	Stem	Eaten raw after bark is peeled	0.52	Not reported
<i>Persicaria bistorta</i> L. subsp. <i>bistorta</i> (Polygonaceae); 85693	Çimeneveliği	Aerial parts	Cooked as meal	0.49	F [28]; M [24,28]

Tab. 1 Continued

Scientific name and family; herbarium number (ISTE)	Local names	Edible parts	Utilization method	CI	Previous ethnobotanical literature records in Turkey
<i>Peucedanum longifolium</i> Waldst. & Kit. (Apiaceae); 85835	Çaşı(u)r	Aerial parts	Pickled	0.57	M [5]
<i>Plantago major</i> L. subsp. <i>intermedia</i> (Gilib.) Lange (Plantaginaceae); 85778	Bağa yaprağı, belhavis	Leaves	Eaten raw, stuffed	0.90	F [9,13,18,27,28,37,40,47,51,60,66]; M [5,6,10,12,20–22,24,25,27,28,30–34,41,46,49,50,52,53,55,56,58,62–64,68]
<i>Podospermum canum</i> C. A. Mey. (Asteraceae); 84501	Yelmik	Leaves	Eaten raw, as salad	1.05	F [16,17,22,23,33,47,56]; FD [22]
		Petiole	Eaten raw	0.64	
<i>Podospermum laciniatum</i> (L.) DC. (Asteraceae); 84504	Yelmik	Leaves	Eaten raw, as salad	1.03	F [38]; FD [7]
		Petiole	Eaten raw	1.25	
<i>Polygonum aviculare</i> L. (Polygonaceae); 84594	Kuşdili	Aerial parts	Eaten raw, roasted, cooked with yogurt and bulgur	2.24	F [27,43,47]; M [5,6,12,24,30]
<i>Polygonum cognatum</i> Meissn. (Polygonaceae); 85476	Kuşdili	Aerial parts	Eaten raw, roasted, cooked with yogurt and bulgur	1.22	F [6,11,14–17,22,28,33,38,43,45,47,51,56,59,60,66,67]; M [5,10,31,48,50,53,55,56,58,64,68]; FD [22]; D [48]
<i>Prangos ferulacea</i> (L.) Lindl. (Apiaceae); 85647	Sarıçaşır	Leaves	Eaten raw, as salad	0.97	F [14,42,45,47]; M [5]
<i>Primula auriculata</i> Lam. (Primulaceae); 84461	Mustafa çiçeği	Petioles	Eaten raw	0.20	F [35]; M [5]
<i>Primula veris</i> L. subsp. <i>macrocalyx</i> (Bunge) Lüdi (Primulaceae); 84463	Ayrançiçeği	Petioles	Eaten raw	0.54	F [18]; M [6]; O [47]
<i>Prunus dulcis</i> (Mill.) D. A. Webb. (Rosaceae); 84618	Badem	Seed	Eaten fresh or dried	1.49	F [6,10,22]; M [5,12,21,30,32,36,48,51–54]; D [48]
<i>Pseudomuscari forniculatum</i> (Fomin) Garbari (Asparagaceae); 84405	Yağlıca	Bulbs	Eaten raw	0.12	Not reported
		Leaves	Cooked with milk and rice	0.13	
<i>Puschkinia scilloides</i> Adams (Asparagaceae); 84417	Kardelen	Leaves	Eaten raw, as salad	0.26	F [43,47]
<i>Ranunculus arvensis</i> L. (Ranunculaceae); 85296	Mustafa çiçeği	Flowers	Cooked with rice	0.53	M [5]
<i>Ranunculus sommieri</i> Albov (Ranunculaceae); 85319	Mustafa çiçeği	Flowers	Cooked with rice	0.52	F and M [28]
<i>Ranunculus oreophilus</i> Bieb. (Ranunculaceae); 85558	Mustafa çiçeği	Flowers	Cooked with rice	0.09	M [5]
<i>Rapistrum rugosum</i> (L.) All. (Brassicaceae); 84553	Türpenk	Stem	Eaten raw after bark is peeled	0.96	F [16]; M [5]
<i>Rheum ribes</i> L. (Polygonaceae) in open market	İşgın	Root	As hot drink	0.22	F [6,13,14,16–18,27,28,35,45,47,51]; M [5,12,28,30,32,34,41,46,50,62–64]
		Stem	Eaten raw after bark is peeled	1	

Tab. 1 Continued

Scientific name and family; herbarium number (ISTE)	Local names	Edible parts	Utilization method	CI	Previous ethnobotanical literature records in Turkey
<i>Rosa canina</i> L. (Rosaceae); 84574	İtburnu	Fruit	Eaten raw, prepared as marmalade, as hot drink	2	F [6,11,15,20,22,27,37,38,40,43,47,51,61,66,67]; M [5,12–14,19–22,24,25,27,28,30–32,34,36,41,44,46,47,49,50,52–58,60,62–64,68]; FD [22]
<i>Rosa hemisphaerica</i> J. Herrm. (Rosaceae); 85526	Yemişen	Fruit	Eaten raw, as hot drink	0.48	F [10,43,66]; M [5,60]; O [47]
<i>Rosa xanthina</i> Lindl. (Rosaceae); 85730	Koyungözü	Fruit	Eaten fresh, prepared as marmalade, as hot drink	0.35	F [27,28,45]; M [5,27,28]; O [43]
<i>Rosularia sempervivoides</i> (Fischer ex M. Bieberstein) Boriss. (Crassulaceae); 85802	Çobandürmeği	Leaves	Eaten raw	0.12	F [14,45]
<i>Rumex acetosella</i> L. (Polygonaceae); 85485	Çimenturşusu	Aerial parts	Eaten raw	0.77	F [6,10,14–18,20,22,23,27,37,43,47,49,67]; M [5,12,36,50,55,64,68]; FD [22]
<i>Rumex crispus</i> L. (Polygonaceae); 85680	Adameveliği	Leaves	Stuffed, cooked with bulgur and legumes	1	F [6,10,15,16,22,27,28,33,38,40,45,47,56,59]; M [5,19,24,31,46,48,55,56,62,68]; FD [22]; D [48]
<i>Rumex patientia</i> L. (Polygonaceae); 85606	Ateveliği	Leaves	Cooked with bulgur and legumes	0.83	F [5,10,14–18,28,60,67]; M [28,48,64]; D [48]
<i>Rumex scutatus</i> L. (Polygonaceae); 85553	Daşturşusu	Aerial parts	Eaten raw	0.57	F [6,9,22,27,33,43,45,47,60,61,67]; M [5,10,14,22,27,32,38,44,62]; FD [22]
<i>Rumex tuberosus</i> L. subsp. <i>horizontalis</i> (Koch) Rech. (Polygonaceae); 85691	Kömeturşusu	Leaves	Eaten raw	0.6	F [6,9,18,20,27,43,45,67]; M [5,10,19,20,27,29,34,35,48,50,62,65]; D [57]
		Stem	Eaten raw after bark is peeled	0.49	
<i>Salvia aethiopsis</i> L. (Lamiaceae); 85761	Maldili	Leaves	Cooked with yogurt	0.09	M [6]
		Stem	Eaten raw after bark is peeled	0.06	
<i>Salvia brachyantha</i> (Bordz.) Pobed. (Lamiaceae); 85312	Gazangulpu	Leaves	Stuffed	0.09	Not reported
<i>Salvia limbata</i> C. A. Meyer (Lamiaceae); 85532	Maldili	Stem	Eaten raw after bark is peeled	0.11	Not reported
<i>Salvia staminea</i> Montbret & Aucher ex Benthham (Lamiaceae); 85672	Gazankulpu	Leaves	Cooked with bulgur	0.10	M [28]
<i>Scorzonera szovitzii</i> DC. (Asteraceae); 84489	Dombalan	Leaves	Eaten raw, as salad	1.01	F [6,14,27,35,36,43,47,56,60,66,67]; M [5,36,50]
		Root	Eaten raw after bark is peeled	0.37	

Tab. 1 Continued

Scientific name and family; herbarium number (ISTE)	Local names	Edible parts	Utilization method	CI	Previous ethnobotanical literature records in Turkey
<i>Scorzonera suberosa</i> K. Koch (Asteraceae); 84502	Gızbaldırı	Leaves	Eaten raw, as salad	0.57	F [6,43,66]; M [5]
		Root	Eaten raw after bark is peeled	0.3	
<i>Sedum telephium</i> L. (Crassulaceae); 85442	Camışgulağı	Leaves	Eaten raw	0.16	M [6]
<i>Sempervivum armenum</i> Boiss. & Huet (Crassulaceae); 85697	Çobandürmeği	Leaves	Eaten raw	0.48	F [22]
<i>Silene compacta</i> Fischer (Caryophyllaceae); 85745	Horuzpipiği	Leaves	Cooked with bulgur, roasted with egg	0.18	F [14]
<i>Silene vulgaris</i> (Moench) Garcke (Caryophyllaceae); 84539	Gıvışgan	Aerial parts	Roasted with egg	0.52	F [6,10,14–16,22,23,29,38,42,44,60,67]; M [12,36,44,50]; FD [22]
<i>Taraxacum androssovii</i> Schischk. (Asteraceae); 85269	Zeze	Leaves	Boiled and cooked as meal	0.5	M [5]
<i>Taraxacum fedtschenkoi</i> Hand.-Mazz. (Asteraceae); 84498	Acıgıcı	Leaves	Boiled and cooked as meal	0.36	M [5]
<i>Taraxacum macrolepium</i> Schischk. (Asteraceae); 84494	Acıgıcı	Leaves	Boiled and cooked as meal	0.48	M [5,28]
<i>Thalictrum minus</i> L. (Ranunculaceae); 84473	Gaytaran	Aerial parts	Boiled and eaten with yogurt and bulgur	0.32	M [28,47,58]
<i>Thymus fallax</i> Fisch. & C. A. Mey. (Lamiaceae); 84513	Kekotu	Aerial parts	As spice and hot drink	0.98	F [45,47]; M [5]
<i>Thymus kotschyanus</i> Boiss. & Hohen. (Lamiaceae); 85794	Kekotu	Aerial parts	As spice and hot drink	0.91	F [14,35,42,47,51,67]; M [5,12,34,41,48,50]; D [48]
<i>Thymus migricus</i> Klokov & Des.-Shost. (Lamiaceae); 84516	Kekotu	Aerial parts	As spice and hot drink	0.79	F [42,47]; M [5,64]
<i>Thymus praecox</i> Opiz. subsp. <i>grossheimii</i> (Ronniger) J alas var. <i>grossheimii</i> (Lamiaceae); 85486	Kekotu	Aerial parts	As spice and hot drink	1.04	F [6,15]; M [5,25]
<i>Thymus transcaucasicus</i> Ronniger (Lamiaceae); 85492	Kekotu	Aerial parts	As spice and hot drink	1	M [5,28]
<i>Tragopogon coloratus</i> C. A. Mey. (Asteraceae); 84503	Atyemliği	Aerial parts	Eaten raw	0.40	F [47]; M [5]
<i>Tragopogon dubius</i> Scop. (Asteraceae); 85622	Atyemliği	Aerial parts	Eaten raw	0.73	F [6]; M [5]
<i>Tragopogon orientalis</i> L. (Asteraceae); 85291	At yemliği	Aerial parts	Eaten raw	0.69	F [6]; M [5]
<i>Tragopogon reticulatus</i> Boiss. & Huet (Asteraceae); 84505	Atyemliği	Aerial parts	Eaten raw	0.66	M [5,50]
<i>Trifolium ambiguum</i> M. Bieb. (Fabaceae); 85699	Almaotu	Flowers	Eaten raw	0.68	M [5]

Tab. 1 Continued

Scientific name and family; herbarium number (ISTE)	Local names	Edible parts	Utilization method	CI	Previous ethnobotanical literature records in Turkey
<i>Trifolium campestre</i> Schreb. (Fabaceae); 85822	Üzüm	Flowers	Eaten raw	0.79	M [65]; FD [40]
<i>Trifolium pratense</i> L. (Fabaceae); 84431	Almaotu	Flowers	Eaten raw	0.75	F [27,51]; M [5,6,12,32,50,58]
<i>Trifolium repens</i> L. (Fabaceae); 84430	Almaotu	Flowers	Eaten raw	0.49	F [27,42,43,47]; M [5,6,12,32,34,36,47]
<i>Trifolium spadicum</i> L. (Fabaceae); 85694	Üzüm, tut	Flowers	Eaten raw	0.09	Not reported
<i>Urtica dioica</i> L. (Urticaceae); 85582	Gizirkan	Aerial parts	Eaten raw, cooked with bulgur	1.26	F [6,7,11,13,14,16,18,22,23,27,28,33,35,37,38,40,43–45,47,49,51,59–61,67]; M [5,12,19–22,24,25,27,28,30–34,36,41,43,46,48,50,55,56,58,60–65]; FD [40]; D [48]
<i>Viburnum lantana</i> L. (Caprifoliaceae); 85729	Germeşo	Fruit	Eaten raw, as hot drink	0.56	F [27]; M [5,6,27]; O [6,27]
<i>Vicia cracca</i> L. (Fabaceae); 85518	Gürül	Seeds	Eaten raw	0.87	F [10,35]; M [5,32]; FD [10,22,33,40]
<i>Ziziphora clinopodioides</i> Lam. (Lamiaceae); 85747	Merze	Aerial parts	As a spice and hot drink	0.46	F [6,14,42,47,67]; M [5,6,64]
<i>Ziziphora taurica</i> M. Bieb. (Lamiaceae); 85655	Merze	Aerial parts	As a spice and hot drink	0.39	F [6,23]; M [5,53,55]
<i>Zosima absinthifolia</i> Link (Apiaceae); 85656	Pölük	Leaves	Boiled and roasted, pickled	0.75	F [42,43,47]; M [5]
		Stem	Eaten raw after bark is peeled	0.40	

ISTE – The Herbarium of Istanbul University, Faculty of Pharmacy; CI – cultural importance index. Food: M – medicinal; FD – fodder; D – dye; O – ornamental.

Cooked consumption

A large number of taxa are used, with several kinds of cooking methods, but two kinds of dish are particularly popular. The first common dish is called “ayranaşı”. It is prepared with plants like the aerial parts of *Anthriscus* species, *Chenopodium* species, *Convolvulus arvensis*, *Falcaria vulgaris*, *Malabaila dasyantha*, and *Polygonum aviculare*. Firstly, the aerial parts of the plants are boiled in water with bulgur, then yoghurt is added. It is usually consumed for lunch or dinner in summer. The second dish is called “sütaşı” or “sabahaşı” and it is prepared with the leaves of *Pseudomuscari forniculatum* or *Bellevalia* species. They are boiled with milk and usually eaten for breakfast.

Another consumption category is stuffed foods. The leaves of *Arctium platylepis*, *Heracleum trachyloma*, *Plantago major*, *Rumex crispus*, and *Salvia brachyantha* are stuffed with meat and bulgur. The dish is prepared by women. Another one of the cooking methods is roasting. Leaves of some of the Asteraceae and Chenopodiaceae species are thinly sliced before frying, then egg and onions are added. Sometimes they are put into pies. Another interesting consumption method is the preparation of poisonous plants as food. *Caltha palustris*, *Ficaria vascicularis*, and *Thalictrum minus*, all of which have a bitter taste and toxic ingredients [77], are boiled in water, and the aqueous part is discarded. The poultice is always served with yoghurt. Local people do not consume these kinds of poisonous plants without yoghurt, which is used in order to reduce the



Fig. 4 Meal of *Caltha palustris* petioles with yoghurt.

risk of poisoning after boiling and discarding the water (Fig. 4). A practical and common method for the storage and the consumption of plants in winter is using them as pickles. Aerial parts of some Apiaceae species (*Ferula caspica*, *F. rigidula*, *Peucedanum longifolium*, and *Zosima absinthifolia*) are treated with salt and vinegar and prepared as a pickle. Cooking marmalade or jam with fruits is very popular among local women in the province. Fruits of *Crataegus* species, *Rosa canina*, and *R. xanthina* are boiled with sugar and consumed as jam or marmalade. Several aromatic wild plants are used as flavoring, *Mentha longifolia* and *Thymus* species are the most common spices which are used to flavor meat dishes and soups. Some of the taxa are used as recreational teas, to be drunk in the absence of any health problem. The aerial parts of *Rheum ribes*, and the fruits of *Viburnum lantana* and Rosaceae species are used as hot drinks (Tab. 1).

Discussion

The data presented in this paper was compared with some published ethnobotanical studies in Turkey [5–68]. Twenty-two of these studies [5,12,27,28,32,34–36,39,41–43, 45–47,50,51,58,62–64,67] were carried out in the same geographical region, East Anatolia. The results of this comparison are presented in Tab. 1. According to this comparison, *Urtica dioica* (26 references), *Chenopodium album* (22 references), *Mentha longifolia* (21 references), *Polygonum cognatum* (19 references), *Capsella bursa-pastoris* (17 references), *Malva neglecta* (17 references), *Rumex acetosella* (16 references), *Rosa canina* (15 references), *Rumex crispus* (14 references), and *Silene vulgaris* (13 references) have prevalent distribution and similar utilization in Iğdır and other literature in Turkey [6,7, 9–18,20,22,23,27,28,33,35,37,38,40,42–45,47,49,51,56–61,66,67].

Comparisons between the traditional uses of plants in Turkey, as found in the ethnobotanical literature [5–68], also revealed that *Allium flavum*, *Bellevalia paradoxa*, *Chaerophyllum angelicifolium*, *C. aureum*, *Cymbocarpum anethoides*, *Gladiolus kotschyianus*, *Leontodon asperrimus*, *Nonea stenosolen*, *Onosma bornmuelleri*, *O. nigri-caulis*, *Ornithogalum montanum*, *Pedicularis comosa*, *Persicaria alpina*, *Pseudomuscari forniculatum*, *Salvia brachyantha*, *S. limbata*, and *Trifolium spadiceum* were recorded for the first time in this study. On the other hand, other species of *Allium*, *Chaerophyllum*, *Gladiolus*, *Onosma*, *Ornithogalum*, *Salvia*, and *Trifolium* were recorded as edible in the literature [5–68]. What is more, *Achillea tenuifolia*, *Alcea striata* subsp. *rufescens*, *Alkanna orientalis*, *Artemisia austriaca*, *Asparagus persicus*, *Beta corolliflora*, *Bunias orientalis*, *Convolvulus scammonia*, *Cyanus cheiranthifolius*, *Diplotaxis tenuifolia*, *Echium vulgare*, *Ferula caspica*, *Iris iberica* subsp. *elegantissima*, *Jurinella moschus* subsp. *pinnatisecta*, *Malabaila secacul*, *Nonea macrosperma*, *Peucedanum longifolium*, *Ranunculus arvensis*, *R. oreophilus*, *Salvia aethiopsis*, *S. staminea*, *Sedum telephium*, *Taraxacum androssovii*, *T. fedtschenkoi*, *T. macrolepium*, *Thalictrum minus*, *Thymus transcaucasicus*, *Tragopogon*

reticulatus, *Trifolium ambiguum*, and *T. campestre* were not previously recorded as edible. *Achillea*, *Alcea*, *Alkanna*, *Artemisia*, *Asparagus*, *Beta*, *Bunias*, *Convolvulus*, *Echium*, *Ferula*, *Iris*, *Malabaila*, *Nonea*, *Peucedanum*, *Salvia*, *Sedum*, *Taraxacum*, *Thymus*, *Tragopogon*, and *Trifolium* are other species and commonly used as food [5–68]. The consumption of *Convolvulus*, *Sedum*, *Tragopogon*, and *Trifolium* species fresh, *Ferula* and *Peucedanum* species as pickle, and *Thymus* species as spices is very common in the eastern part of Turkey [27,28,35,39,42,43,45–47,51,67].

If we compare this data with other edible plant literature in Turkey [14–18,23,29,35,37,38,51,66], this study comprises probably the richest heritage ever recorded in Turkey in terms of the diversity of wild food plants still gathered and consumed.

According to the calculation of the cultural importance index (CI) [75,76], the 20 most culturally important species in Iğdır Province are shown in Fig. 5. *Mentha longifolia* has the highest value and *Cymbocarpum anethoides* has the lowest.

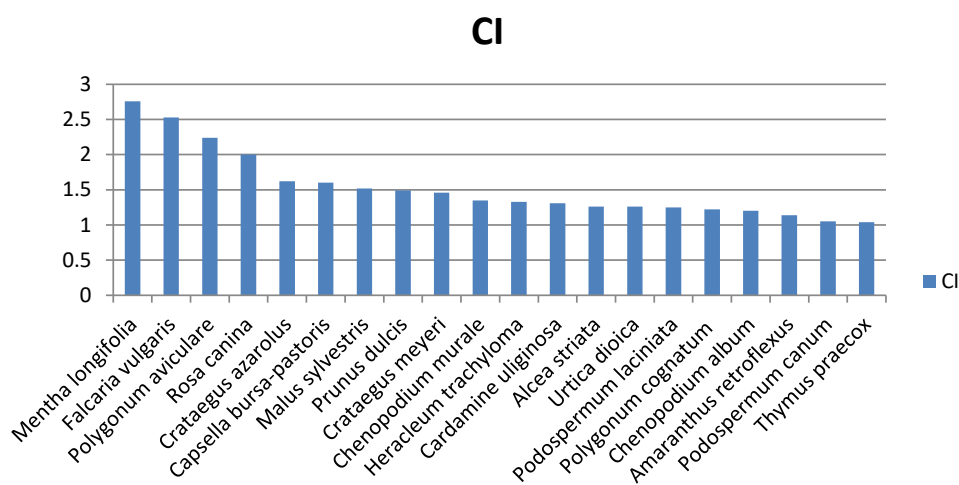


Fig. 5 Cultural importance index (CI) of the 20 most relevant species.



Fig. 6 *Pseudomuscari forniculatum*; an endemic species.

Twenty of the wild edible plants consumed in the area are considered to be poisonous [77]. These are *Diploaxis tenuifolia*, *Echium italicum*, *E. vulgare*, *Ferula caspica*, *F. rigidula*, *Ficaria fascicularis*, *Heracleum trachyloma*, *Ornithogalum narbonense*, *O. montanum*, *O. oligophyllum*, *Papaver lacerum*, *P. orientale*, *Primula auriculata*, *P. veris*, *Prunus dulcis*, *Ranunculus arvensis*, *R. sommieri*, *R. orephilus*, *Thalictrum minus*, and *Urtica dioica*.

Among all the edible plants in the province, there are eight endemic taxa: *Allium armenum*, *Pseudomuscari forniculatum* (Fig. 6), *Nonea macrosperma*, *N. stenosolen*, *Onosma argentatum*, *O. bornmuelleri*, *O. nigricaula*, and *Sempervivum armenum*. Uncontrolled collection of these endemic plants poses a big threat to their populations because the parts eaten are the bulbs (e.g., *Allium armenum*) or flowers (e.g., *Onosma* species).

The study shows that people who live far away from the town, in mountain villages, use wild plants more often. Wild edible plants are still recognized both by the elderly and by some young local people in the villages of Iğdır Province, despite migration from villages to metropolitan cities like Istanbul, Ankara, and İzmir.

Extensive investigations are needed to discover and track those wild plants, which have been used for centuries in these rural regions, and their effects on human life.

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