

## Survey of wild food plants for human consumption in Bingöl (Turkey)

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This study focused on the wild plants traditionally used for human consumption in Bingöl and its aim is to present data about the folk botanical knowledge and to give about their development in relation to plant resources and traditionally food culture. The information about the use of wild edible plants was collected from 6 different open-air-markets and 13 villages in the city during two-year period (2012-2013), through unstructured interviews. In this study, a total of 61 wild food plant taxa belonging to 25 families were established and also plant parts used, ethnographic data related to vernacular names, traditional use were recorded. Family *Rosaceae* is represented by the highest number of taxa (9), followed by *Lamiaceae* (8), *Astaraceae* (7), *Apiaceae* (6), *Fabaceae* (4) and *Polygonaceae* (3). The study showed that the plants used are either eaten raw, cooked by boiling in water, frying in oil or baked to be served as dishes such as stew, *salad* as hot drink. During this ethnobotanical research, it was verified that wild edible plants play an important role in diet in Bingöl. Furthermore, during our study *Heracleum pastinacifolium* C. Koch, *Origanum acutidens* (Hand.-Mazz.). Letsw., *Prunus kurdica* Fenzl ex Fritsch, *Quercus petraea* subsp. *pinnatiloba* (K. Koch) Menitsky has been recorded as endemic wild food plant taxa from Bingöl.

**Keywords:** Wild food plants, Ethnobotany, Bingöl, Turkey

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The livelihood of the rural people does not depend only on the agricultural and animal products, but also on other natural resources, such as plants and the forests<sup>1,2</sup>. Traditional knowledge of plants and their properties has always been transmitted from generation to generation through the natural course of everyday life. However, the continuation of this knowledge is endangered when transmission between the older and younger generation is no longer assured<sup>3</sup>. It is known that wild plants are richer in minerals compared to cultivated ones. The study of nutrient composition of such plants has become common in different parts of world<sup>4</sup>. Wild edible flora did not play a major role in the population's survival in ancient times. Wild edible plants may satisfy the daily human need for elementary nutrition sources, particularly those of vitamins C and A, and for some minerals, according to WHO regulations<sup>5</sup>.

Turkey hosts more than 3000 endemic plant species, has high diversity of other taxa, and is almost entirely covered by three of the world's 34 biodiversity hotspots<sup>6</sup>. Over the past decade, a

number of summarizing ethnographic studies on food and the nutrition about Turkey were published, based on document collections, regional folklore studies, etc.<sup>5,7,8</sup>. They draw attention to historical aspects of food and nutrition, the relationship between cooking and the gender roles of women and men in daily food preparation<sup>8,9,10</sup>. Several previous studies have described the traditional knowledge about the plants in the research area and the uses and different needs for them such as medicine, local markets and more<sup>10,11</sup>. In the Eastern Anatolia Region, most ethnobotanic studies have been conducted in Elazığ, Erzurum & Van<sup>4</sup>. In the Bingöl area there is only one study subject matter of which is about local bazaar<sup>8</sup>. The aim of present study is to evaluate the traditional uses of local wild food plants to provide safe and efficient information for people and to preservation of culture, tradition, conservation and sustainable utilization of medicinal plants. This study was also conducted to serve as a source for scientists for the purpose of determining the nutritional value of edible wild plants by comparing information obtained in ethnobotany studies, and researching the safety of the use of these plants.

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## Materials and methods

### Study area

Bingöl, which is located in the Upper Euphrates Section of Eastern Anatolian Region, lies between 38° 27' and 40° 27' eastern longitudes and 41° 20' and 39° 54' northern latitudes (Fig. 1). Bingöl is neighbour to Muş in the East, Erzincan and Erzurum in the North, Tunceli in the West and Diyarbakır in the South. Mean daily temperature is 12.1 °C. Annual rainfall is 873.7 mm and the number of days on which it snows is 24.5 days<sup>12</sup>. Study area was located on the East of Anatolian diagonal, in the skirts of South-Eastern Taurus Mountains in the Upper Euphrates Region of the Eastern Anatolia Region<sup>13</sup>. Belongs to the Irano-Tueanian Plant Geography Region and falls within the B8 grid square according to the Grid classification system developed by Davis<sup>14</sup>. According to the data obtained from the website of Bingöl Provice Administration (<http://www.bingol.gov.tr/>). Bingöl is very mountainy area. There are mountains heights of which reach 3000 m (Bingöl Mountains 3250 m, Çötele Mountains 2940 m, Şeytan Mountains 2906 m). The heights of the plateaus and plains on the mountains do not fall down less than 2000 m. Even heights of the places like meadows do not fall down less than 1000 m. Climax and glacial lakes cover the highest parts of the mountains; skirts of the mountains are covered by moraine. Mountains are generally covered by straggly forests; some parts of the South regions are stark. Oak forests are found at

the parts which are lower than 1800 m. The total population is 256 thousand while the central population is around 90 thousand according to population census in 2009. According to the data from Turkish Statistical Institute (<http://tuikapp.tuik.gov.tr/adnksdagitapp/adnks.zul>) Turkey's population is 73.722.988 and Bingöl's population is 255.170 as of the date of 31<sup>th</sup> December 2010. The *Zazas* are of the major ethnic group in the region, with small minorities of *Turkish* and *Kurdish* groups in the province. *Zazaish* people are a community who honorably preserved their own identity and adopted being neither *Turkish* nor *Kurdish*. However, a significant part of *Zazaish* people adopt *Kurdish* upper identity today<sup>15</sup>.

### Plant materials

Field study was carried out over a period of approximately 2 yrs (2012-2013). Special attention was paid to conduct the field trips together with the resource people on most of the field visits. Plant diagnosis has been made from the samples prepared for herbarium. The plants were pressed in the field and prepared for identification. Plants were identified using the standard text, "Flora of Turkey and the East Aegean Islands"<sup>14</sup>, and plant samples are being kept in Giresun University Herbarium (GUH). The names of plant families were listed in alphabetic order. Scientific names of plant species were identified according to the plant list (<http://www.theplantlist.org>-<http://www.ipni.org>). After the taxon names were identified, instances of endemism and hazard categories<sup>16</sup> were specified.

### Interviews with local people

Field research was conducted by collecting ethnobotanical information during structured and semi-structured interviews with knowledgeable people native in 13 village and city centers. A questionnaire was administered to the local people, through face to face interviews (Fig. 2). The local community was informed and their permissions were received before applying the questionnaire. Avarage age of the respondents was 50 yrs (in 18-97 yrs range). Interviews were made on the busy hours of the common areas (bazaars, tea houses, farms, gardens, etc). The questionnaire was generally administered to people over 35 who know more knowledge about plants. The people who had knowledge of plants were visited at least for two times; one of these visits is particularly paid to their houses. During the interviews,



Fig. 1 — Geographical location of the study area



Fig. 2 — Interviews with native people

demographic characteristics of the study participants, and local names, utilized parts and preparation methods of the wild food plants were recorded. The people who participated in the study were requested to show the wild plants they used.

### Calculations

The use value<sup>17</sup>, a quantitative method that demonstrates the relative importance of species known locally, was also calculated according to the following formula:  $UV = U/N$ .

Where, UV refers to the use value of a species; U to the number of citations per species; and N to the number of informants.

### Results and discussion

#### Demographic characteristics of study participants

The people who served as source for this study consist of those who live in Central Bingöl and the villages attached to the Centre. The source people have mostly Kurd-Zaza origins. Data was collected from 117 informants (72 female and 45 male). Average age 50, who have used wild plants in their diet under varied circumstances and sold these plants in the local markets of Bingöl. 27 of those source people have never received regular education. A total

of 42 of the participants were primary school graduate, 23 were secondary school graduate, 16 were high school graduate and 9 were university graduates.

#### Use of wild plants as food

The list of species is presented in alphabetical order by Latin name and includes data on family, local name(s), parts used, and mode of preparation (Table 1). Aerial parts, branches, flowers, fruits, leaves, roots, seeds, stems, and tubers are used as food. In general, wild plants are used uncooked and without any processing, by preparing salads from them. They are also used as pickles, jam, tea by preparing syrups. They can be used as fruit-or spice by boiling them with water, rice, meat and egg or as a filling ingredient for pies. They are also stuffed or soups are made from them.

Ethnobotanical studies carried out for determining the traditional use of plants have increased in different parts of Turkey and in the world<sup>18-31</sup>. Interviews with the local people living in Bingöl and villages in the study area indicated that 61 plants were used for food purposes. The most common families are: Rosaceae (9 plants), Lamiaceae (8 plants), Asteraceae (7 plants), Apiaceae (6 plants), Fabaceae (4 plants). Asteraceae (9 plants), Rosaceae (8 plants), Lamiaceae (8 plants), Brassicaceae (4 plants), Fabaceae (4 plants) were found out in a study conducted in the vicinity of our research<sup>9</sup>.

In a study carried out in Çatak (Van), it was found out that plants belonging to the families of Apiaceae (15 plants), Asteraceae (13 plants), Rosaceae (10 plants), Amariyllidaceae (4 plants), Fabaceae (4 plants)<sup>32</sup>, and Asteraceae, Lamiaceae, Rosaceae, and Fabaceae, in Erzincan<sup>33</sup> are widely used by local people living in the region. Four of those plant are endemic. The most commonly used species are *Urtica dioica* L., *Malva neglecta* Wallr., *Eremurus spectabilis* Bieb., *Plantago major* L., *Gundelia tournefortii* L., *Mentha longifolia* (L.) L., *Rosa canina* L., *Rubus sanctus* Schreber, *Anchusa azurea* Mill., *Rheum ribes* L., *Rhus coriaria* L., *Creatagus* sp., *Thymus* sp. These plants are very common among the local communities in terms of food preparation in Bingöl (Table1).

Aerial parts stem and leaves are most often used in food preparation as leafy vegetables. Some of these plants parts gathered mainly during the spring and used as vegetables (*Nasturtium officinale*, *Trifolium pratense*, *Rheum ribes*, *Tragopogon pterocarpus*, *Gundelia tournefortii*, *Scorzonera semicana*). Some of them consumed as cooked vegetable dish

Table 1 — Wild food plants in Bingöl

Plant No.	Family	Plant species, voucher specimen	Vernacular name in Bingöl	Edible parts <sup>a</sup>	Utilization methods <sup>b</sup>	UV
1	Amaranthaceae	<i>Amaranthus retroflexus</i> L. RP-370	<i>Tar, Tar gor, Leğendur</i>	Aer	Lco, Coo	0.29
2	Amaryllidaceae	<i>Allium</i> sp. RP-472	<i>Sir, Kahar, Kar</i>	See, Lea	Add, Ass, Les	0.34
3	Anacardiaceae	<i>Rhus coriaria</i> L. RP-492	<i>Sumak</i>	Fru	Ass, Pss, Stv	0.51
4	Apiaceae	<i>Ferula orientalis</i> L. RP-493	<i>Kırkor, Kınkor, Kaşkoruk</i>	Ste	As pickles	0.12
5		<i>F. rigidula</i> Fisch ex DC. RP-494	<i>Heliz</i>	Ste	As pickles	0.12
6		<i>Heracleum pastinacifolium</i> C.Koch RP-491	<i>Helelg, Lerg</i>	Ste	Cos	0.27
8		<i>Anthriscus</i> sp. RP-47	<i>Mende, Mendu</i>	Aer	Cos	0.17
9		<i>Sium sisarum</i> L. RP-497	<i>Vinye, Vınık, Tırvaş</i>	Aer	Cos	0.15
10	Araceae	<i>Arum elognatum</i> Steven. RP-334	<i>Kardun, Kardu, Kardu</i>	Lea	Les	0.16
11	Asparagaceae	<i>Asparagus persicus</i> Baker RP-511	<i>Melcü, Melji, Kuşkonmaz</i>	Ste	Cos	0.22
12	Asphodelaceae	<i>Eremurus spectabilis</i> Bieb. RP-409	<i>Yelg, Gullık, Guling, Çiriş</i>	Lea	Lcv	0.40
13	Asteraceae	<i>Anthemis</i> sp. RP-41	<i>Papatya</i>	Flo	Aht	0.20
14		<i>Bellis perennis</i> L. RP-49	<i>Papatya</i>	Flo	Aht	0.08
15		<i>Gundelia tournefortii</i> L. var. <i>tournefortii</i> RP-380	<i>Kinger, Kenger</i>	Aer	Cos, Ear, Obt	0.44
16		<i>Helianthus tuberosus</i> L. RP-487	<i>Say erd, Yer elması</i>	Tub	Eaf	0.34
17		<i>Scorzonera mollis</i> M. Bieb. RP-385	<i>Şing, Vil</i>	Aer	Cos	0.17
18		<i>Tragopogon reticulatus</i> Boiss. & Huet RP-378	<i>Marşing</i>	Flo, Lea	Eaf, Pie	0.21
19	Boraginaceae	<i>Anchusa azurea</i> Mill. RP-392	<i>Gelezun, Gelezun</i>	Lea	Lcv	0.44
21	Brassicaceae	<i>Capsella bursa-pastoris</i> (L.) Medik. RP-433	<i>Pironek, Non mirçikon</i>	Aer	Cos	0.33
22		<i>Nasturtium officinale</i> R.Br. RP-303	<i>Kiji, Qije, Tujik</i>	Aer, Lea	Eaf, Les	0.17
23	Caryophyllaceae	<i>Silene vulgaris</i> (Moench) Gracke RP-382	<i>Masturek, Dulma Xatun</i>	Aer	Cos	0.12
24	Chenopodiaceae	<i>Chenopodium album</i> L. RP-160	<i>Selmi, Silmastık</i>	Lea	Cos	0.17
25	Fabaceae	<i>Cicer anatolicum</i> Alef. RP-505	<i>Nihe Keku, Nihe mirçikon</i>	Fru	Eaf	0.03
26		<i>Glycyrrhiza glabra</i> L. RP-479	<i>Bıyan, Meyan</i>	Roo	Roc, Trb	0.32
27		<i>Trifolium pratense</i> L. RP-130	<i>Argud, Nefil</i>	Aer	Eaf	0.34
28		<i>Quercus petraea</i> subsp. <i>pinnatiloba</i> (K.Koch) Menitsky RP-335 Endemic.	<i>Mazer, Welg</i>	Fru	Ifp	0.11
29	Iridaceae	<i>Iris reticulata</i> Bieb. RP-383	<i>Kilozık, Gul sosın, Kuelbıza</i>	Aer	Eaf	0.17
30		<i>Iris caucasica</i> Hoffm. RP-405 RP-83	<i>Kuelbıza, Tumane Keku</i>	Flo	Eaf	0.13
31	Juglandaceae	<i>Juglans regia</i> L. RP-135	<i>Çeviz, Goz</i>	See	Adi, Eaf	0.43
32	Lamiaceae	<i>Mentha longifolia</i> (L.) L. subsp. <i>typhoides</i> (Briq.) Harley RP-33	<i>Pune, Puni, Nane</i>	Lea	Aht, Ass, Les, Lcv	0.45
33		<i>Origanum vulgare</i> L. RP-474	<i>Onix, Anix, Kekik</i>	Lea, Flo	Aht, Ass	0.28
34		<i>O. acutidens</i> (Hand.-Mazz.) letsw. Endemic. RP-516	<i>Onix, Anix, Kekik</i>	Lea, Flo	Aht, Ass	0.28
35		<i>Stachys lavandulifolia</i> Vahl. RP-473	<i>Çaye qwe, Deme çole</i>	Flo	Aht	0.20
36		<i>Teucrium polium</i> L. RP-500	<i>Meyremxort</i>	Flo	Ass	0.18
37		<i>Teucrium chamaedrys</i> L. subsp. <i>sinuatum</i> (Celak.) Rech. f. RP-361	<i>Çaye qwe, Çaye çiya</i>	Flo	Aht	
38		<i>Thymus kotschyanus</i> Boiss. & Hohen. RP-301	<i>Onix, Anix, Kekik</i>	Lea	Ass	0.41
39		<i>T. sipyleus</i> Boiss. RP-308	<i>Onix, Anix, Kekik</i>	Aer	Ass	0.40

Contd

Table 1 — Wild food plants in Bingöl

Plant No.	Family	Plant species, voucher specimen	Vernacular name in Bingöl	Edible parts <sup>a</sup>	Utilization methods <sup>b</sup>	UV
40	Malvaceae	<i>Hibiscus trionum</i> L. RP-11	<i>Hatmi çiçeği</i>	Flo	Aht	0.23
41		<i>Malva neglecta</i> Wallr. RP-469	<i>Xemazek, Veraruejuk, Ebegümece, Duelik</i>	Bra, Lea	Coo	0.62
42	Moraceae	<i>Ficus carica</i> L. RP-15	<i>Yabani incir</i>	Fru	Eaf, Jam	0.36
43		<i>Morus nigra</i> L. RP-16	<i>Karadut</i>	Fru	Eaf, Jam	0.39
44	Papaveraceae	<i>Papaver rhoeas</i> L. RP-468	<i>Buk, Gelincik</i>	Flo	Cos	0.22
45	Plantaginaceae	<i>Plantago major</i> L. RP-331	<i>Pel hewes, Pelonbaş, Ominwaş</i>	Lea	Uss	0.60
46	Polygonaceae	<i>Polygonum cognatum</i> Meissn. RP-502	<i>Madımak</i>	Aer, Lea	Coo, Eaf, Les	0.32
47		<i>Rheum ribes</i> L. RP-460	<i>Ribes, Rewas, Kap, Işgın</i>	Aer	Cos, Eaf	0.38
48	Portulacaceae	<i>Rumex tuberosus</i> L. RP-462	<i>Tırşık</i>	Lae	Eaf	0.24
49		<i>Portulaca oleracea</i> L. RP-464	<i>Pirpirim</i>	Aer, Lea	Frs, Lcv	0.41
50		Rosaceae	<i>Amygdalus communis</i> L. RP-93	<i>Badem, Ajik, payam, Çagala</i>	See	Ead, Usp
51		<i>Cydonia oblonga</i> Miller RP-456	<i>Ayva</i>	Fru	Esf, Jam	0.23
52		<i>Crataegus azarolus</i> L. var. <i>aronia</i> L. RP-375	<i>Gunc</i>	Fru	Eaf	0.30
53		<i>C. atrosanguinea</i> Pojark. RP-374	<i>Sinz, Sez, Roğık</i>	Fru	Eaf	0.32
54		<i>C. orientalis</i> Pal. ex Bieb. RP-377	<i>Sinz, Sez, Risok</i>	Flo	Aht	0.32
55		<i>Prunus kurdica</i> Fenzl ex Fritsch. Endemic RP-388	<i>Momux, Mamux, Lektur</i>	Fru	Eaf	0.15
56		<i>Pyrus communis</i> L. RP-42	<i>Querç, Şekok, Herim</i>	Fru	Eaf, Jam	0.40
57		<i>Rosa canina</i> L. RP-326	<i>Sırgul, Şılan</i>	Flo	Aht, Jam, Syr	0.51
58		<i>Rubus sanctus</i> Schreber RP-504	<i>Dırık, Tiri</i>	Fru	Eaf, Jam	0.44
59	Ulmaceae	<i>Sorbus torminalis</i> (L.) Crantz.	<i>Gılguşar</i>	Fru	Eaf	0.03
60		<i>Celtis tournefortii</i> Lam. RP-373	<i>Tee, Dardağan</i>	Fru	Eaf	0.20
61		Urticaceae	<i>Urtica dioica</i> L. RP-454	<i>Derzinik, Gerzinik, Gezok, Yağij, Isırgan</i>	Lea	Aht, Cos

The abbreviation; <sup>a</sup> Plant part(s) used: Aer, aerial parts; Bra, branches; Flo, flowers; Fru, fruits; Lea, leaves; Roo, roots; See, seeds; Ste, stems; Tub, tubers. <sup>b</sup> Adi, Added into pie and cakes; Add, Added to foods by milling its seeds; Aht, As herbal tea; Ass, Ss spice; Coo, Cooked vegetable dish; Cos, Cooked as a stew or egg-vegetable dish; Eaf, Eaten fresh; Ead, Eaten as dried nuts; Ear, Eaten by removing its awns; Frs, Fresh as salad or cooked plant is with yogurt; Ifp, It is fried in pan then their acorn is eaten; Jam, Jam is made; Lco, Leaves cooked as vegetable or egg-vegetable dish; Lcv, Leaves cooked as vegetable; Les, Leaves eaten in salads; Obt, Obtained gum is chewed; Pie, Pie is made from its leaves; Pss, Prepared sour souce is added to food; Roc, Roots, chewed and sucked; Stv, Stuffed vegetables and salads; Syr, Syrup is prepared; Trb, Their root is boiled and soup is made; Usp, Used in pie making; Uss, Used as stuffing leaves from fresh leaves.

(*Amaranthus retroflexus*, *Silene vulgaris*, *Arum elognatum*, *Gundelia tournefortii*, *Capsella bursa-pastoris*, *Chenopodium album*, *Eremurus spectabilis*, *Malva neglecta*, *Papaver rhoeas*, *Polygonum cognatum*, *Portulaca oleracea*, *Urtica dioica*).

Among the various gathered parts of wild edible plants, fruits (14 species) are gathered most by consumers of these communities and are usually eaten raw. Fruits were obtained, mostly from Rosaceae. They can be consumed fresh (*Crataegus* sp., *Rubus sanctus*, *Pyrus communis*, *Prunus kurdica*, *Celtis tournefortii*, *Sorbus torminalis*) and dried (*Rosa canina*, *Cydonia oblonga*). Fresh or dried fruit may be cooked in water until tender and used to make

jams, marmalade (*Crataegus monogyna*, *Rosa canina*, *Rubus sanctus*). The fruits gathered during the summer or autumn (apples, plums, and pears) are cut in slices and dried. They are consumed directly or stewed and sweetened in the winter.

Flowers and branches are most used as herbal tea (11 species) or as spice (9 species). Species of *Mentha longifolia*, *Origanum acutidens*, *Origanum vulgare*, *Rhus coriaria*, *Teucrium polium*, *Thymus sipyleus*, *Thymus kotschyanus* are used as spice in Bingöl. It is very common to consume wild plants as tea. Species of *Rosa canina*, *Rubus sanctus*, *Anthemis* sp. *Bellis perennis*, *Stachys lavandulifolia*, *Crataegus* sp., *Hibiscus* sp., *Origanum vulgare*, *Urtica dioica* are consumed as herbal tea in Bingöl.



Taxa such as, *Arum elognatum* Steven, *Chaerophyllum bulbosum* L., *Silene vulgaris* (Moench) Gracke, *Iris caucasica* Hoffm., *Stachys lavandulifolia* Vahl., etc., whose edible use has been documented, but have not been recorded in the nearby areas. *Heracleum pastinacifolium* C. Koch, *Origanum acutidens* (Hand.-Mazz.) letsw., *Prunus kurdica* Fenzl ex Fritsch, *Quercus petraea* subsp. *pinnatiloba* (K. Koch) Menitsky were found to be the endemic plants used for food purposes in Bingöl, Turkey.

It was observed that some wild food plant taxa were extensively used for commercial purposes in Bingöl. *Rosa canina* L. (*sırgul*, *şilan*), *Rhus coriaria* L. (*sumax*), *Gundelia tournefortii* L. (*kinger*, *kereng*), *Crataegus* ssp. (*sinz*, *sez*, *gunc*), *Eremurus spectabilis* Bieb. (*yelg*, *gulık*), *Malva neglecta* Wallr. (*xemazek*, *tollık*, *veraruejk*), *Anchusa azurea* Mill. (*gelzun*), *Plantago major* L. (*pel hewes*, *omulwaş*), *Urtica dioica* L. (*derzink*, *gerzink*, *yeğıç*), *Rheum ribes* L., (*ribes*, *riwes*, *rewas*), *Onopordum acanthium* L. (*kinger heron*), and *Stachys lavandulifolia* Vahl. (*çaye qwe*, *çaye çiya*, *deme çole*). Are among the herbs extensively collected and traded in the area. Collecting and trading these species that grow in vast localities in the region have become the source of income for hundreds of local people.

In Turkey, local plant names display differences especially due to local dialects<sup>34</sup>. The plants used in Bingöl are known by the same or different local names in various parts of Anatolia. For example, the local names of *Rumex tuberosus* L. (*tırsoka kera*), *Plantago major* L. (*belghevizar*), *Malva neglecta* Wallr. (*tolga küvi*)<sup>35</sup> are different from the local names used in Bingöl.

The use of wild plants by the population reflects the social structure of society and, therefore, the social differentiations in nutrition. Along with cultural and socio-economic development, attitudes toward wild food sources are changing. For a long period after the sixties of the last century, the use of wild edible plants was considered a sign of poverty and low social status<sup>36</sup>.

### Data analysis

According to the calculation made on the basis of the use-value UV<sup>17</sup> *Malva neglecta* Wallr. (0.62), *Urtica dioica* L. (0.62), *Plantago major* L. (0.60), *Rosa canina* L. (0.51), *Anchusa azurea* Mill. (0.44), *Gundelia tournefortii* L. (0.42), *Eremurus spectabilis* Bieb. (0.40), *Rheum ribes* L. (0.38), *Crataegus* spp.

(0.32), *Arum* sp. (0.22) and *Stachys lavandulifolia* Vahl. (0.20) were reported to be of the highest use value (Table 1).

### Conclusion

Collecting information about how people deal with their natural surrounding is not only important for the recording of local cultural traditions and the richness of this heritage, but also gives us some of the information necessary to protect our natural habitat in the long term.

The present study showed the function of wild edible plants as a sign of the cultural identity of Bingöl peoples but also reveals the vital importance of wild plants to building the typical taste and characteristic methods of preparing and eating food. Within the scope of this study, edible 25 families and 61 plant taxa have been determined. In the study, it is observed that uses of some of wild food plants used are as indicated in literature while some of them are new records. In literature research, there were no findings that 7 of those taxa are used as food plant. Among all the edibles, we recorded four endemic species for Turkey. While, *Heracleum pastinacifolium* C. Koch stems used for consumed as cooked vegetable dish, the acorn of *Quercus petraea* subsp. *pinnatiloba* (K. Koch) Menitsky are eaten heated. *Origanum acutidens* (Hand.-Mazz.) letsw. leaves use as herbal tea and spice in the region. *Prunus kurdica* Fenzl ex Fritsch fruits are edible, and eaten mostly fresh by children.

The data we have presented here showed that gathering, processing and consuming wild edible plants are still important activities in the Bingöl. Due to geographical structure and local problems faced in East of Turkey, there is hardly ever any study carried out on plants. Therefore, this study may be an important and suggestive source for further ethnobotanical studies in the region.

### References

- 1 Sundriyal M & Sundriyal RC, Wild edible plants of the Sikkim Himalaya: Nutritive values of selected species, *Econ Bot*, 55 (2001) 377-390.
- 2 Alam N, Shinwari ZK, Ilyas M & Ulah Z, Indigenous knowledge of medicinal plants of Chagharzai Valley, District Buner, Pakistan, *Pak J Bot*, 43 (2) (2011) 773-780.
- 3 Kargioğlu M, Cencki S, Serteser A, Evliyaoğlu N, Konuk M, Kök MŞ & Bağcı Y, An ethnobotanical survey of inner-West Anatolia, *Turkey, Hum Ecol*, 36 (2008) 763-77.
- 4 Doğan Y, Başlar S, Ay G & Mert HH, The use of wild edible plants in western and central Anatolia (Turkey), *Econ Bot*, 58 (4) (2003) 684-690.

- 5 Kaval İ, Behçet L & Çakılcıoğlu U, Survey of wild food plants for human consumption in Geçitli (Hakkari/Turkey), *Indian J Tradit Knowle*, 14 (2) (2014) 183-190.
- 6 Mittermeier RA, Gil PR, Hoffman M, Pilgrim J, Brooks T, Mittermeier JC, Lamoreux J, & da Fonseca G AB, Hotspots Revisited: Earth's biologically richest and most endangered terrestrial ecoregions, Amsterdam University Press, Amsterdam; 2005.
- 7 Polat R, Çakılcıoğlu U, Ertuğ F & Satıl F, An evaluation of ethnobotanical studies in Eastern Anatolia, *Biol Divers Conserv*, 5 (2) (2012) 23-40.
- 8 Ertuğ F, Wild edible plants of the Bodrum Area (Muğla, Turkey), *Turk J Bot*, 28 (2004) 161-174.
- 9 Polat R, Çakılcıoğlu U, Uluhan MS & Paksoy MY, Survey of wild food plants for human consumption in Elazığ (Turkey), *Indian J Tradit Knowle*, 1 (1) (2015) 69-75.
- 10 Polat R, Selvi S, Çakılcıoğlu U & Açar M, Investigations of ethnobotanical aspect of wild plants sold in Bingöl (Turkey) local markets, *Biol Diver Conserv*, 5 (3) (2012) 155-161.
- 11 Polat R, Cakilcioglu U & Satıl F, Traditional uses of medicinal plants in Solhan (Bingöl-Turkey), *J Ethnopharmacol*, 148 (2013) 951-63.
- 12 Bakoğlu A, Bingöl ve Elazığ illerinde tarımsal yapı, *DAUM*, 2 (3) (2004) 138-143.
- 13 Şengün MT, The effect of Keban Dam Lake to Elazığ climate under the last valuations light, *DAUM*, 5 (2007) 116-121.
- 14 Davis PH, *Flora of Turkey and the East Aegean Islands*, Vol.1-9, (Edinburgh: Edinburgh University Press), 1965-1985.
- 15 Önder AT, *Türkiye'nin etnik yapısı*, (Ankara: Önderler Publication), 1999.
- 16 Ekim T, Koyuncu M, Vural M, Duman H, Aytaç Z & Adıgüzel N, Red Data Book of Turkish Plants (Pteridophyta and Spermatophyta), (Turkish Association for the Conservation of Nature, Ankara), 2000.
- 17 Trotter RT & Logan MH, Informant consensus: a new approach for identifying potentially effective medicinal plants, In: *Plants in Indigenous Medicine and Diet, Behavioural Approaches*, edited by Etkin N L, (Redgrave Publishing Company, Bredford Hills, NY), 1986.
- 18 Akgül G, Yılmaz N, Celep A, Celep F & Çakılcıoğlu U, Ethnobotanical purposes of plants sold by herbalists and folk bazaars in the center of Cappadocia (Nevşehir, Turkey), *Indian J Tradit Knowle*, 15 (1) (2016) 103-108.
- 19 Korkmaz M, Kandemir A & Karacan S, A survey on determining the plant taxa of Zetrin spice used in Kemaliye District (Erzincan, Turkey), *Bothalia*, 44 (3) (2014) 101-118.
- 20 Paksoy MY, Selvi S & Savran A, Ethnopharmacological survey of medicinal plants in Ulukışla (Niğde-Turkey), *J Herbal Med*, 6 (2016) 42-48.
- 21 Masafu MM, Mbajjorgu CA, Nemadodzi LE & Kabine ES, A study of natural habitats and uses of medicinal plants in Thulamela and JS Moroka Municipalities, South Africa, *Indian J Tradit Knowle*, 15 (3) (2016) 363-369.
- 22 Pattanayak S, Mandal TK & Bandyopadhyay SK, Ethnobotanical study on the medicinal plants traditionally used in southern districts of West Bengal, India, *Indian J Tradit Knowle*, 15 (3) (2016) 482-486.
- 23 Goswami D, Mukherjee PK, Kar A, Ojha D, Roy S & Chattopadhyay D, Screening of ethnomedicinal plants of diverse culture for antiviral potentials, *Indian J Tradit Knowle*, 15 (3) (2016) 474-481.
- 24 Korkmaz M, Karakuş S, Selvi S & Çakılcıoğlu U, Traditional knowledge on wild plants in Üzümlü (Erzincan-Turkey), *Indian J Tradit Knowle*, 15 (4) (2016) 538-545.
- 25 Korkmaz M & Karakurt E, Medicinal plants sold in the herbal markets in Kelkit (Gümüşhane), *Suleyman Demirel Univ J Nat Appl Sci*, 18 (3) (2014) 60-80.
- 26 Korkmaz M & Karakuş S, Traditional uses of medicinal plants of Üzümlü district, Erzincan, Turkey, *Pak J Bot*, 47 (1) (2015) 125-134.
- 27 Figueiredo GM, Leitao-Filho HF & Begossi A, Ethnobotany of Atlantic Forest Coastal Communities: II. diversity of plant uses at Sepetiba Bay (SE Brazil), *Hum Ecol*, 25 (2) (1997) 353-360.
- 28 Albuquerque UPD, Re-examining hypotheses concerning the use and knowledge of medicinal plants: a study in the Caatinga vegetation of NE Brazil, *J Ethnobiol Ethnomed*, 2 (2006) 30.
- 29 Albuquerque UPD, Monteiro JM, Ramos MA & Amorim ELCD, Medicinal and magic plants from a public market in northeastern Brazil, *J Ethnopharmacol*, 110 (2007) 76-91.
- 30 Lucena RFP, Nascimento VT, Araújo EL & Albuquerque UPD, Local uses of native plants in an area of Caatinga Vegetation (Pernambuco, NE Brazil), *Ethnobot Res Appl*, 6 (2008) 3-13.
- 31 Çakılcıoğlu U & Türkoğlu İ, 2007. Plants used for hemorrhoid treatment in Elazığ central district, *Acta Horticulturae* 826 (2007) 89-96.
- 32 Mükemre M, Behçet L & Çakılcıoğlu U, Survey of wild food plants for human consumption in villages of Çatak (Van-Turkey), *Indian J Tradit Knowle*, 15 (2) (2016) 181-191.
- 33 Korkmaz M, Karakuş S, Özçelik H & Selvi S, An ethnobotanical study on medicinal plants in Erzincan, Turkey, *Indian J Tradit Knowle*, 15 (2) (2016) 192-202.
- 34 Polat R, Cakilcioglu U & Satıl F, Traditional uses of medicinal plants in Solhan (Bingöl-Turkey), *J Ethnopharmacol*, 148 (2013) 951-963.
- 35 Kaval I, Behçet L & Cakilcioglu U, Ethnobotanical study on medicinal plants in Geçitli and its surrounding (Hakkari-Turkey), *J Ethnopharmacol*, 155 (2014) 171-184.
- 36 Luczaj L, Kohler P, Piroznikow E, Graniszewska M, Pieroni A & Gervasi T, Wild edible plants of Belarus: from Rostafiński's questionnaire of 1883 to the present, *J Ethnobiol Ethnomed*, 9 (2013) 21.