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Traditional food uses of wild plants among the Karlıova (Bingöl-Turkey)

Muharrem Nadiroğlu*[1], Lütfi Behçet[2]

[1]*Bingöl University, Department of Biology, Bingöl, Turkey, orcid.org/0000-0002-6262-8237,*

**Corresponding author; muharremnadiroglu@gmail.com*

[2]*Bingöl University, Department of Biology, Bingöl, Turkey, orcid.org/0000-0001-8334-7816*

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Abstract

The information provided by this kind of research aims to record accumulation of knowledge on plants which are used as food by native people of Karlıova (Eastern Anatolia - Turkey). Study area was located on the east of Anatolian diagonal, in the Eastern Anatolia Region. Field study was carried out over a period of approximately 4 yrs (2013-2016). In this study, a total of 53 wild food plant taxa belonging to 25 families were established and also plant parts used, ethnobotanic data related to local names, traditional use were recorded. Family Rosaceae is represented by the highest number of taxa (10), followed by Apiaceae (6 plants), Lamiaceae (6 plants), Liliaceae (6 plants), Polygonaceae (6 plants). The study showed that the plants used are either eaten raw, cooked vegetable dish; added into pie and cakes, as herbal tea, as spice, jam is made, leaves eaten in salads, used as stuffing leaves from fresh leaves etc. This study reveals that the rural populations in Eastern Anatolia have a rich knowledge of forest-based natural resources and consumption of wild food plants is still part of their socio-cultural life.

Keywords: Traditional use, Food plants, Ethnobotany, Karlıova, Bingöl, Turkey.

1. Introduction

Ethnobotanical knowledge is one of the precious cultural heritage parts of an area that involves the interaction between plants and people and foremost among these are the management of plant diversity by indigenous communities and the traditional use of plants (Ishtiaq et al., 2007). Nowadays, wild food plants are generally known to have high nutritional values, higher fibre and polyphenol contents, and greater antioxidant capacity than

the corresponding cultivated species (Leonti et al., 2006). Indigenous communities of different localities of the world have developed their own specific knowledge on plant resources, uses, natural resource management and conservation (Cotton, 1996).

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 (Mittermeier et al., 2005). Last years, a number of summarizing ethnographic studies on food and the nutrition about Turkey were published, based on document collections, regional folklore studies, etc. (Ertuğ, 2004; Kaval et al., 2014a; Korkmaz et al., 2016b). 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 (Polat, 2012a; 2013; 2015). Some 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 (Polat, 2012b; 2013). In the Eastern Anatolia Region, most ethnobotanic studies have been conducted in Elazığ, Erzurum and Van (Polat, 2012b). 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.

2. Materials and methods

2.1. Study area

Karlıova (Fig. 1) is located in the South-East of Turkey. Karlıova belongs to the Iran–Turan Plant Geography Region and falls within the B8 grid square according to the Grid classification system developed by Davis. It is at the South-East of the Anatolian Diagonal, which is one of the main endemism centers in Turkey (Davis, 1965-1985).

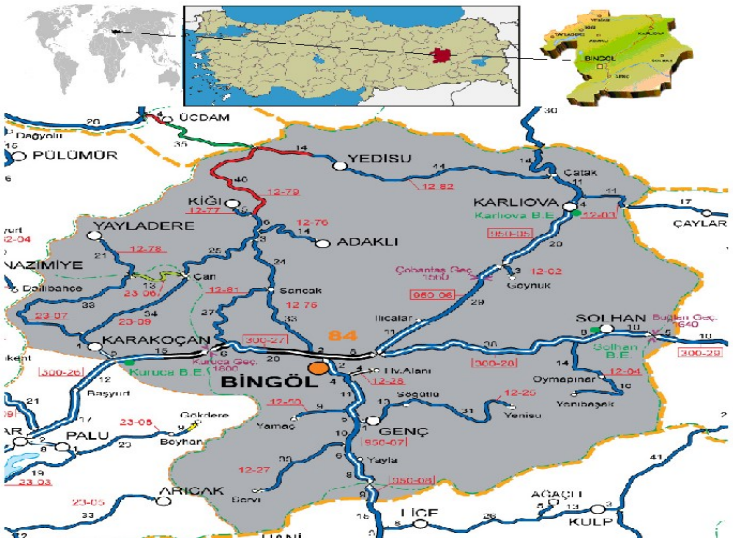

Figure1. Geographical location of the study area.

According to the data obtained from the website of Karlıova District Administration (http://www.karliova.gov.tr/), Karlıova has 47 villages and 26 sub-village. Surface area of the sub-province is 1392 km^2 and is 1940 m high from sea level. It is located on the high plateaus of Eastern Anatolian Region. Karlıova was added to the Ottoman territories after the triumph of Çaldıran War in 1514. It remained dependent on Muş province after the Proclamation of the Republic in 1923 until 1936 and then became the district of Bingöl province. It is 70 km distant from the city center. It is possible to clearly and perfectly watch the "Sun Rise" within the boundaries of this district.

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. In the region, Bingol is known as Çewlig and Çolig. Bingöl is neighbour to Muş in the east, Erzincan and Erzurum in the north, Tunceli in 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 (Bakoğlu, 2004). 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 belongs to the Iran-Turan Plant Geography Region and falls within the B8 grid square according to the Grid classification system developed by (Davis, 1965-1985; Davis et al., 1988; Şengün, 2007).

According to population census results conducted in 2013, total population of Karlıova is 32.212. Within the scope of the research, interviews were conducted with Kurdish people

and people of Zaza ethnic origin. The Kurdishs are of the major ethnic group in the region. The Zazas mostly live in the Eastern Anatolia Region of Turkey (Arakelova, 1999).

Study permit was obtained from the Karlıova District Administration and Gendarmerie for the questionnaire administered to the citizens of the towns and villages affiliated to Eastern Anatolia.

2.2. Plant materials

Fieldwork was carried out over a period of approximately 4 yrs (2013–2016). Plant samples (fresh plants, dried plants and sometimes herbal preparations) were collected at informants' homes or nearby areas. When possible, more knowledgeable informants were followed into the field to show us the reported plants.

During this period, 53 vascular plant specimens were collected. The plants were pressed in the field and prepared for identification. The plants collected within the scope of the study were identified by the authors, rendered herbarium materials. The names of plant families were listed in alphabetic order.

2.3. Interviews with local people

A questionnaire was administered to the local people, through face-to-face interviews (Appendix A) (Fig. 2). Interviews were made on the busy hours of the common areas (bazaars, gardens, tea houses, etc.) visited by the citizens of Karlıova District. In Karlıova, people we selected from towns, and villages were first informed about our research and only upon their consent the interviews took place. During interviews, only those persons who were observed to have knowledge regarding wild food plants were invited to a survey study. In order to obtain detailed information from people who had knowledge of plants, they were visited at least two times; and one of these visits took place particularly in their houses. During the interviews, demographic characteristics of the study participants, and local names, utilized parts and preparation methods of the plants were recorded.

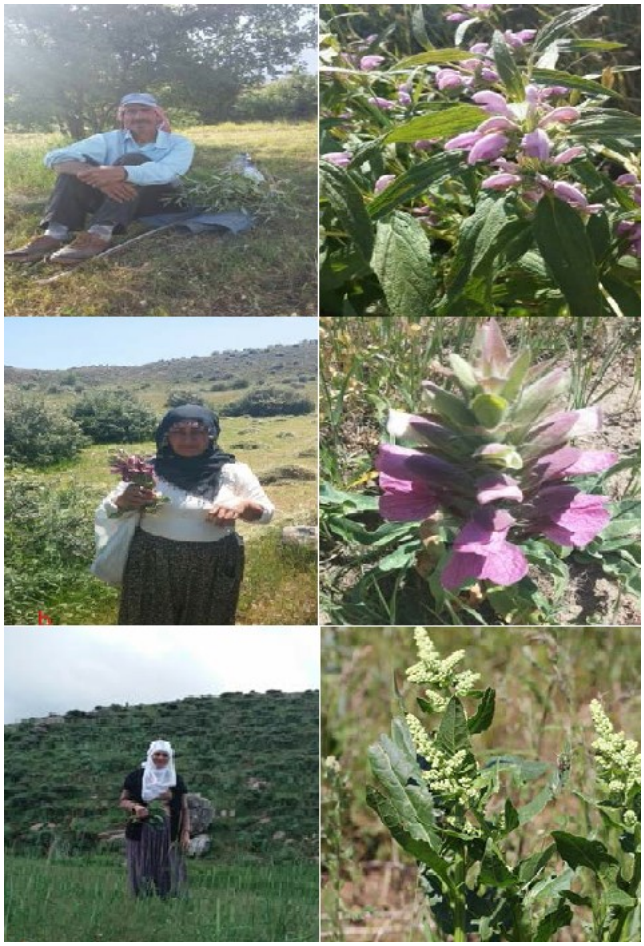

Figure 2. Interviews with native people.

2.4. Calculations

The use value (Trotter and Logan, 1986) 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.

3. Results and discussion

3.1. Demographic characteristics of study participants

The people who served as source for this study consist of those who live in Karlıova and the villages attached to the Centre. The source people have mostly Kurd-Zaza origins. Data was collected from 59 informants (26 female and 33 male). Average age 53, who have used wild food plants in Karlıova. 31 of those source people have never received regular education. A total of 26 of the participants were primary and secondary school graduate, 1 were high school graduate and 1 were university graduates.

3.2. Use of wild plants as food

The names of plant families were listed in alphabetic order by Latin name and includes data on species, voucher specimen, vernacular name(s) in Karlıova, edible parts, utilization methods and UV (Table 1). Aerial parts, branches, bulb, flowers, fruits, leaves, latex, roots, seeds, stems, tubers, and whole plant 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 jam, tea by preparing syrups. They can be used as fruit-or spice by boiling them with water, meat and egg or as a filling ingredient for pies. They are also stuffed or soups are made from them.

The studies on plants and mushroom in different regions of Turkey has increased (Çakılcıoğlu and Türkoglu, 2007; Behçet and Arık, 2013; Kaval et al., 2014; Korkmaz et al., 2014; 2016a; Paksoy et al., 2016; Erdem et al., 2017; Erecevit and Kırbağ, 2017; Yüce Babacan and Bagcı, 2017; Tüzün et al., 2018). Interviews with the local people living in Karlıova and villages in the study area indicated that 53 plants were used for food purposes. The most common families are: Rosaceae (10 plants), Apiaceae (6 plants), Lamiaceae (6 plants), Liliaceae (6 plants), Polygonaceae (6 plants).

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), Amaryllidaceae (4 plants), Fabaceae (4 plants) (Mükemre, 2016) are widely used by local people living in the region. The most commonly used species are *Urtica dioica* L., *Rosa canina* L., *Portulaca oleracea* L., *Rheum ribes* L., *Mentha longifolia* L. (L.), *Allium cepa* L., and *Thymus kotschyanus* Boiss & Hohen. These plants are very common among the local communities in terms of food preparation in Karlıova (Table1).

Areial 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 (*Allium sativum* L*., Cardamine uliginosa* M. Bieb., *Mentha longifolia* L. (L.), *Ocimum basilicum* L., *Portulaca oleracea* L., *Rumex acetosella* L.) Some of them consumed as cooked vegetable dish (*Amaranthus chlorostachys* Willd., *Anchusa azurea* Mill., *Anthriscus nemorosa* (M.Bieb.) Sprengel, *Arum elongatum* Steven, *Beta* sp., *Cerinthe minor* L., *Chenopodium album* L., *Eremurus spectabilis* M.Bieb., *Heracleum persicum* Desf., *Ononis spinosa* L., *Pimpinella anthriscoides* Boiss., *Prangos pabularia* Lindl., *Rumex alpinus* L., *Urtica dioica* L.).

Table 1. Wild food plants in Karlıova.

Plant No.	Family	Plant species, voucher specimen	Vernacular name	Edible parts[a]	Utilization methods[b]	UV
1.	Amaranthaceae	*Amaranthus chlorostachys* Willd. MN97	Sılmastık	Aer	Lco	0.02
2.	Apiaceae	*Anthriscus nemorosa* (M.Bieb.) Sprengel MN51	Xitok	Lea, Flo	Lco	0.02
3.		*Chaerophyllum crinitum* Boiss. MN128	Xilok	Roo	Eaf	0.03
4.		*Eryngium billardieri* Delar. MN88	Kereng nebi, Kerenge kera	Ste	Eaf	0.08
5.		*Heracleum persicum* Desf. MN69	So, Helerg	Ste, Lea	Lco, Ust	0.06
6.		*Pimpinella anthriscoides* Boiss. var. *anthriscoides* MN10	Pıngi, Masterek, Mendık	Aer	Lco	0.10
7.		*Prangos pabularia* Lindl. MN18	Zıvrık, Cağık, Cağ	Aer	Lco, Ust	0.09
8.	Araceae	*Arum conophalloides* Kotschy ex Schott var. *conophalloides* MN33	Kardi	Aer	Sop	0.04
9.		*Arum elongatum* Steven subsp. *detruncatum* (C.A.Mey. ex Schott) Riedl. MN32	Kardi, Kari	Aer	Lco, Sop	0.06
10.	Asteraceae	*Gundelia tournefortii* L. MN11	Kinger, kereng	Who	Eaf	0.21
11.		*Scorzonera latifolia* (Fisch. & C.A.Mey.) DC. MN68	Kanıke benişt	Lat	Lac	0.03
12.		*Tussilago farfara* L. MN54	Kelsım, Pelli kesım	Lea	Uss	0.04
13.	Boraginaceae	*Anchusa azurea* Mill. var. *azurea* MN44	Gurız, Gerzun	Aer	Lco	0.17
14.		*Cerinthe minor* L. subsp. *auriculata* (Ten.) Domac MN126	Sisık	Aer	Lco	0.03
15.	Brassicaceae	*Cardamine uliginosa* M. Bieb. MN2	Kıji, Kıçi	Aer	Les	0.02
16.	Chenopodiaceae	*Beta lomatogona* Fisch. & C.A. Mey. MN59	Sılk, Sılka beci, Sılkık	Aer	Lco, Uss	0.08

17.		*Beta trigyna* Waldst. & Kit. MN131	Sılk	Aer	Lco	0.05
18.		*Chenopodium album* L. subsp. *album* var. *album* MN98	Kalğatun	Aer	Lco	0.11
19.		*Chenopodium foliosum* (Moench.) Asch. MN83	Tuye kera	Fru	Eaf	0.04
20.	Fabaceae	*Ononis spinosa* L. MN101	Goştberğık	Lea	Lco	0.03
21.	Juglandaceae	*Juglans regia* L. MN140	Çeviz, Goz	See	Adi, Eaf	0.29
22.	Lamiaceae	*Mentha longifolia* L. (L.) MN28	Pung, Pınge, Puni, Pünk, Dere nanesi	Lea	Ass	0.34
23.		*Ocimum basilicum* L. MN110	Ruhan	Aer	Ass, Les	0.27
24.		*Phlomis armeniaca* Willd. MN57	Pazağ	Lea	Lco	0.04
25.		*Stachys lavandulifolia* Vahl var. *lavandulifolia* MN63	Gihaye zerıke	Lea	Aht	0.02
26.		*Teucrium chamaedrys* L. subsp. *sinuatum* (Celak) Rech. f. MN66	Çaya şıvanan	Lea	Aht, Ass	0.05
27.		*Thymus kotschyanus* Boiss & Hohen var. *glabrescens* Boiss. MN65	Anığ	Aer	Ass	0.31
28.	Liliaceae	*Allium cepa* L. MN119	Pivaz	Bul	Adb, Ass	0.33
29.		*Allium sativum* L. MN122	Sir	Bul, Lea	Adb, Ass, Les	0.27
30.		*Allium vineale* L. MN3	Sırım, Sirmok, Sira Çole	Who	Lco, Ust	0.11
31.		*Colchicum szovitsii* Fisch & C.A.Mey. MN1	Pivok	Who	Eaf	0.03
32.		*Eremurus spectabilis* M.Bieb. MN5	Gullık, Yelıng	Bra	Lco, Cos, Sop	0.12
33.		*Ornithogalum narbonense* L. MN81	Zul	Tub	Pim	0.10
34.	Moraceae	*Ficus carica* L. MN141	Yabani incir	Fru	Eaf, Jam	0.17
35.		*Morus nigra* L. MN142	Karadut	Fru	Eaf, Jam	0.21
36.	Polygonaceae	*Polygonum cognatum* Meisn. MN96	Levlevık	Who	Lco	0.20

37.		*Rheum ribes* L. MN20	Rıbez, Içkın	Ste	Eaf	0.36
38.		*Rumex acetosella* L. MN37	Tırşo, Tırşık	Aer	Les, Ust	0.26
39.		*Rumex alpinus* L. MN109	Pijek	Lea	Lco	
40.		*Rumex scutatus* L. MN23	Tırşık, Tirşo	Aer	Syr, Uss	0.21
41.		*Rumex tuberosus* L. subsp. *horizontalis* (Koch.) Rech MN27	Tırşoy ga, Pelle ga	Lea	Uss	0.28
42.	Portulacaceae	*Portulaca oleracea* L. MN111	Pımpar, Semiz otu	Aer	Coo, Les	0.39
43.	Rosaceae	*Crataegus orientalis* Pall. ex M.Bieb. subsp.*orientalis* MN46	Guvij, Sez	Flo, Fru	Eaf	0.27
44.		*Cydonia oblonga* Mill. MN95	Ayva	Fru	Eaf	0.18
45.		*Geum urbanum* L. MN114	Kurfil	Roo	Aht	0.02
46.		*Malus slyvestris* Mill. subsp. *orientalis* var. *orientalis* MN58	Sev	Fru	Eaf	0.07
47.		*Prunus divaricata* Ledeb. subsp. *ursina* (Kotschy) Browicz MN17	Mamoğ, Hurtışık	Fru	Eaf, Jam	0.06
48.		*Pyrus elaeagnifolia* Pall. subsp. *kotschyana* (Boiss.) Browicz MN25	Hırmi	Fru	Eaf	0.09
49.		*Rosa canina* L. MN34	Şilan	Fru	Aht, Jam	0.41
50.		*Rosa heckeliana* Tratt. subsp. *vanheurckiana* (Crepin) O. Nillson. MN120	Şilan	Fru	Aht, Jam	0.09
51.		*Rubus caesius* L. MN112	Dırık, Böğürtlen	Fru	Aht, Eaf	0.12
52.		*Sorbus torminalis* (L.) Crantz var. *pinnatifita* Boiss. MN121	Kırmut	Fru	Eaf	0.02
53.	Urticaceae	*Urtica dioica* L. MN15	Gezgezok	Lea	Aht, Lco	0.45

The abbreviation; [a] Plant part(s) used: Aer, aerial parts; Bra, branches; Bul, Bulb; Flo, flowers; Fru, fruits; Lea, leaves; Lat, latex; Roo, roots; See, seeds; Ste, stems; Tub, tubers; Who, whole plant.

[b] Adi, Added into pie and cakes; Adb, Added to foods by milling its buls; Aht, As herbal tea; Ass, As spice; Coo, Cooked vegetable dish; Cos, Cooked as a stew or egg-vegetable dish; Eaf, Eaten fresh; Jam, Jam is made; Lac, Latex, chewed and sucked; Lco, Leaves cooked as vegetable or egg-vegetable dish; Les, Leaves eaten in salads; Pim, Pilaf is made; Sop, soup is made; Syr, Syrup is prepared; Ust, Used in patty; Uss, Used as stuffing leaves from fresh leaves.

Among the various gathered parts of wild edible plants, fruits (12 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 (*Chenopodium foliosum* (Moench.) Asch., *Crataegus orientalis* Pall. ex M. Bieb., *Cydonia oblonga* Mill., *Ficus carica* L., *Malus sylvestris* Mill., *Morus nigra* L., *Prunus divaricata* Ledeb., *Pyrus elaeagnifolia* Pall., *Rubus caesius* L., *Sorbus torminalis* (L.) Crantz) and dried (*Rosa canina* L, *Rosa heckeliana* Tratt., *Cydonia oblonga* Mill.). Fresh or dried fruit may be cooked in water until tender and used to make jams, marmalade (*Ficus carica* L., *Morus nigra* L., *Prunus divaricata* Ledeb., *Rosa canina* L, *Rosa heckeliana* Tratt.). The fruits gathered during the summer or autumn (*Cydonia oblonga* Mill., *Ficus carica* L., *Malus sylvestris* Mill., *Morus nigra* L., *Prunus divaricata* Ledeb.,) are cut in slices and dried (Fig. 3). They are consumed directly or stewed and sweetened in the winter.

Figure 3. a: *Pyrus elaeagnifolia* Pall. **b**: *Rosa canina* L. **c**: *Malus sylvestris* Mill.

Flowers and branches are most used as herbal tea (6 species) or as spice (6 spices). Species of *Allium cepa* L., *Allium sativum* L., *Mentha longifolia* L. (L.), *Ocimum basilicum* L., *Thymus kotschyanus* Boiss & Hohen, *Teucrium chamaedrys* L. are used as spice in Karlıova. It is very common to consume wild plants as tea. Species of *Rosa canina* L., *Rubus caesius* L., *Rosa heckeliana* Tratt., *Stachys lavandulifolia* Vahl, *Teucrium chamaedrys* L., *Urtica dioica* L. are consumed as herbal tea in Karlıova.

It was observed that some wild food plant taxa were extensively used for commercial purposes in Karlıova (Fig. 4). *Anchusa azurea* Mill., *Gundelia tournefortii* L., *Crataegus orientalis* Pall. ex M.Bieb., *Eremurus spectabilis* Bieb., *Mentha* sp., *Morus nigra* L., *Ocimum basilicum* L., *Rheum ribes* L., *Rosa canina* L., *Stachys lavandulifolia* Vahl, *Thymus* sp., and *Urtica dioica* L. are among the herbs extensively collected and traded in the area.

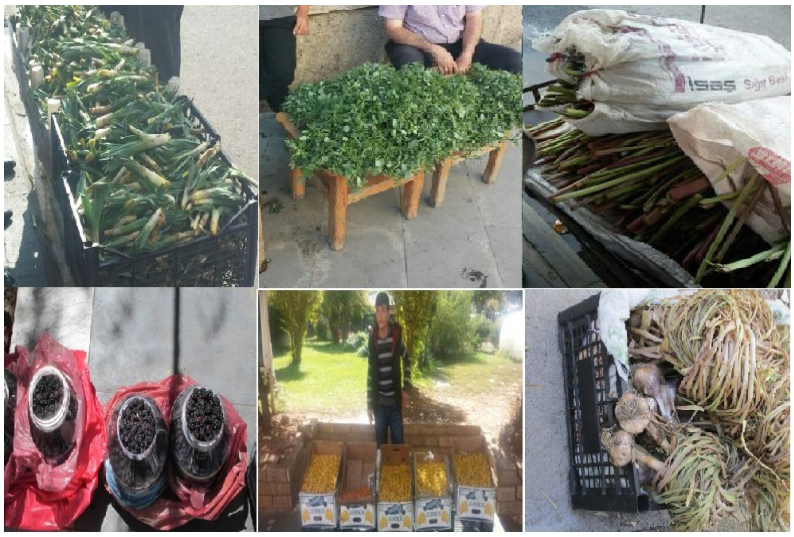

Figure 4. Local markets.

In Turkey, local plant names display differences especially due to local dialects (Polat et al., 2013). The plants used in Karlıova are known by the same or different local names in various parts of Anatolia. For example, the local names of *Eryngium billardieri* Delar. (tüsü), *Heracleum persicum* Desf. (soy), *Scorzonera latifolia* (Fisch. & C.A.Mey.) DC. (nerment), *Anchusa azurea* Mill. var. *azurea* (mıjmejok), *Ononis spinosa* L. (semisk), *Phlomis armeniaca* Willd. (çalba) (Mükemre, 2015) are different from the local names used in Karlıova.

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 (Luczaj, 2013).

3.3. Data analysis

According to the calculation made on the basis of the use-value UV (Trotter and Logan, 1986) *Urtica dioica* L. (0.45), *Rosa canina* L. (0.41), *Portulaca oleracea* L. (0.39), *Rheum ribes* L. (0.36), *Mentha longifolia* L. (L.) (0.34), *Allium cepa* L. (0.33), and *Thymus kotschyanus* Boiss. & Hohen (0.31) were reported to be of the highest use value (Table 1). Knowing the use value of a kind may be useful in determining the use reliability of the related plant (Cakilcioglu and Turkoglu, 2010).

4. Conclusion

This study shows the contimued interest in the use of wild plants as food by the native people in villages of Karlıova. Within the scope of this study, edible 25 families and 52 plant taxa have been determined. Used parts, preparation and use of those plants are recorded. In the case of food use of those plants, it is found out that they are either used in cooking or consumed without cooking. The present studys shows the value of further ethnobotanical investigations in Turkey, where most of knowledge on popular food plants are still undiscovered.

Geographical structure of our study area, insufficient facilities of health and transportation in the past, stockbreeding and nomad lifestyle of the local community have all necessitated them to use wild plants. Information about plant use culture have rapidly started to be forgotten due to the increasing migration from rural to urban areas in recent years. It has been determined that the rate of plant use is lower in villages on Bingöl-Erzurum highway within our study area and higher in villages far from the highway, which might support our claim on the plant use culture. Thus, it is very important to record this culture which has been merely shaped within centuries.

The present study showed the function of wild edible plants as a sign of the cultural identity of Karlıova peoples but also reveals the vital importance of wild plants to building the typical taste and characteristic methods of preparing and eating food. The present studys shows the value of further ethnobotanical investigations in Turkey, where most of knowledge on popular food plants are still undiscovered.

The data we have presented here showed that gathering, processing and consuming wild edible plants are still important activities in the Karlıova. Therefore, this study may be an important and suggestive source for further ethnobotanical studies in the region.

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