Bangladesh J. Plant Taxon. **27**(2): 377-389, 2020 (December)

A STUDY ON WILD EDIBLE PLANTS FOR HUMAN CONSUMPTION IN HIZAN COUNTY OF BITLIS, TURKEY

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Keywords: Bitlis; Hizan; Traditional uses; Turkey; Wild edible plants.

Abstract

This study covers the edible plants in Hizan where there is a rich culture of plant consumption. The study was conducted between 2018 and 2019 to record the culture of traditional food plant use of the local people in Hizan. In this regard, the face-to-face interviews with the local people were made, and the relevant plants used were collected and identified. A total of 65 species of wild edible plants belonging to 24 families were identified, and their different traditional usages were categorized as cooked, cheese making, rennet, specie and gum producing, and as raw or beverages etc. In addition, the use-value (VU) index was calculated for each species. The mostly used species included *Rheum ribes* L. (UV: 0.70), *Gundelia tournefortii* L. (0.66), *Silene vulgaris* (Moench) Garcke, *Rosa canina* L. (0.64), *Urtica dioica* L. (0.63), *Malva neglecta* Wallr. (0.61), and *Pistacia khinjuk* Stocks (0.60). The culture of edible plant use is widespread throughout the Anatolia. However, traditional uses of many wild plants have not been recorded yet. Therefore, this research will be an important contribution to the preservation of the cultural heritage associated with traditional wild edible plants in this region.

Introduction

Wild plants have had an important role in prehistoric communities which supplied their own food needs by hunting and gathering (Baytop, 1999). Since the early ages, human beings have utilized plants found in their region for different purposes. Human beings have learned to make use of plants as food over time and have continued their lives by passing this knowledge from generation to generation and have tended to obtain more efficient and quality products by making the cultivation of highly consumed plants (Urhan *et al.*, 2016). However, only a part of the edible plant species found in nature have been cultivated. The number of species grown as food are around 3,000 while the number of wild plant species that have been used as food is over 10,000 (Baytop, 1999). Wild plants are the cheapest resource of nutrients, providing minerals, vitamins and essential fatty acids, enhancing taste and color in diets (Turan *et al.*, 2003; Green, 1992; Bianco *et al.*, 1998). These wild plants used as food can be grown as alternative crops in the future's agriculture and broadly used in human nutrition.

There are many evidences in Near Eastern regions relevant to the plant consumption of Neandertals (Madella *et al.*, 2002; Henry *et al.*, 2001). Plant products have always had a vital role in the Near East, they have been used as fuel, construction materials and medicines besides as food (Nesbitt, 1995).

In Anatolia, there has been a historical relationship between plant and human. Thus, a rich culture of wild plant use developed in Anatolia. Many wild edible plants that grow naturally, especially in eastern Anatolia, are gathered and consumed as food (Mükemre *et al.*, 2016; Kaval *et al.*, 2015; Polat *et al.*, 2015). Hizan of Bitlis province is a county in eastern Anatolia which was

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a home to many civilizations (Çiçek, 2016). Hizan is also a prominent vegetation area surrounded by high mountains reaching an altitude of about 3000 m (Kılıç *et al.*, 2016). Wild edible plants can be eaten freshly by public living in rural areas, as well as can be consumed as dry during hard winter periods. Along with urbanization, the culture of use of wild edible plants is reducing day by day. For this reason, it is very important that traditional knowledge of the plant use should be recorded before it disappears. This study aims to investigate and record the existing knowledge about wild plants used as food by the indigenous people residing in Hizan of Bitlis province of Turkey.

Materials and Methods

Study area

This research was carried out in the center of in the villages of Gayda, Aladana, Ürünveren, Akşar, Karbastı, Koçyiğit, Nurs, Sağınlı, Oymapınar, Ballı and Döküktaş (Kayaş) of Hizan district. Hizan is located in Eastern Anatolia Region and it is 1700 meter above average sea level. Hizan is neighbour to Gevaş and Bahçesaray (Van) in the east, Şirvan and Pervari (Siirt) in the south and Tatvan (Bitlis) in northwest (Fig. 1).

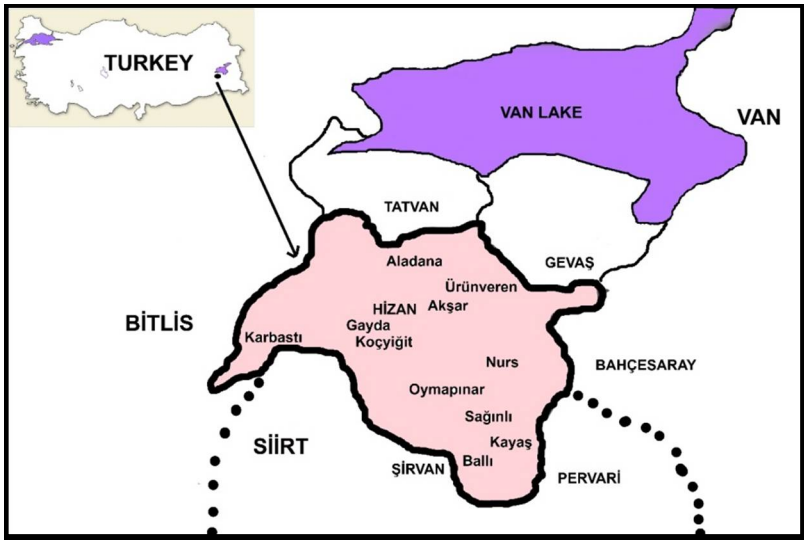

Fig. 1. Geographical location of the study area.

Hizan belongs to the Iran-Turan Plant Geography Region and falls within the B9 grid square according to the Grid classification system developed by Davis (Davis, 1965-1985). According to the results of address-based population census (https://biruni.tuik.gov.tr/ medas/? kn=95& locale=tr) conducted in 2019, the total population of Hizan district is 33.331. The ethnic composition of the district consists of Kurdish people.

Hizan has been a center of civilization since the Hittites. According to historical records, human settlements are known to be present there from the 2000s BC. Human settlements started with the Hittites and continued under Persian, Roman, Byzantine and Arab rule. It was ruled by Seljuks in the 11th century and by Ottomans period in the 16th century. Urartians were probably the first state using the name of "Arart" that is encountered on the records as Hizan's first name. The

name "Seherhizan", given later by the Persians, means "the wakeners in the dawn". This name, which was later shortened as "Hizan", has been recorded in history as "the place of the nation that wakens early" (Çiçek, 2016).

Plant materials

The field study was carried out over a period of approximately two years (2018-2019) and a total of 16 area studies were carried out in two years. During this period, plant materials were collected. The collected samples were prepared according to herbarium techniques, and stored in the Biology Department of Facultyof Arts and Sciences, Bitlis Eren University. Identification of plant taxa, was performed by using Flora of Turkey (Davis, 1965-1985; Güner *et al.*, 2000; Davis *et al.*, 1988). The scientific names of the plant samples were confirmed by using Web site of The Plant List (http://www.theplantlist.org). The taxonomic categories (family, species) of the identified samples were arranged in alphabetical order.

Interviews with native people

In 2018 and 2019, the face-to-face interviews were held with participants who have traditional knowledge and experience. The information was obtained through interviews with 110 people, including 62 women and 48 men. Interviews were mainly conducted with those who were more informative regarding the subject. The ethnic structure of the district consists of Kurds. Therefore, the interviews were in Kurdish. The questions on local name, parts of the plant used, and preparation procedure of the plant or plant part used were asked to the participants and the answers were recorded. In addition, information about the participants (name, surname, sex, age, education, job, etc.) were recorded. Participants generally live in rural areas, but some people usually live in the highlands on a seasonal basis.

Calculations

The use value (UV) index proposed by Phillips and Gentry (1993) has been widely used to quantify the relative importance of species.

The use value (VU) index was calculated for each species using the following Formula:

UV = U/N

UV = the use value of a species,

U = the number of citations per species and **N =** the number of informants.

Results and Discussion

Taxonomic identification of wild edible plants

In this study, 65 taxa belonging to 24 families that are used as food were recorded from Hizan district (Bitlis). Most of these plants belong toApiaceae (14%), followed by Asteraceae, Lamiaceae, Polygonaceae and Rosaceae (with 9% each), Amaryllidaceae (8%), Malvaceae (6%), and Boraginaceae (5%). The remaining plant families (total 31%) are represented by only one or two species (Fig. 2). The plants were categorized into various groups on the basis of their use in Hizan. These uses included those plants that are consumed as cooked vegetables, used in cheese making, used as rennet, spices and gums, and consumed as raw (salads, etc.) or beverages (tea, coffee).

In this study, conducted in Hizan County (Bitlis) during 2018-2019, the recorded uses of wild plants as food are given in Table 1 under the headings-edible parts and utilization methods, with the information regarding family, scientific name, voucher number, and vernacular names (Kurdish). The largest use category was vegetables consumed by cooking with 29 taxa, followed by those consumed as raw (salads, etc.) with 16 taxa, used in cheese making with nine taxa, used

as rennet with seven taxa, consumed seasonally with six taxa, and used as gums and beverages with four taxa each. But some species can be used for more than one purpose (such as *Pistacia khinjuk* used for making both coffee and cheese), thus 71 different uses have been determined.

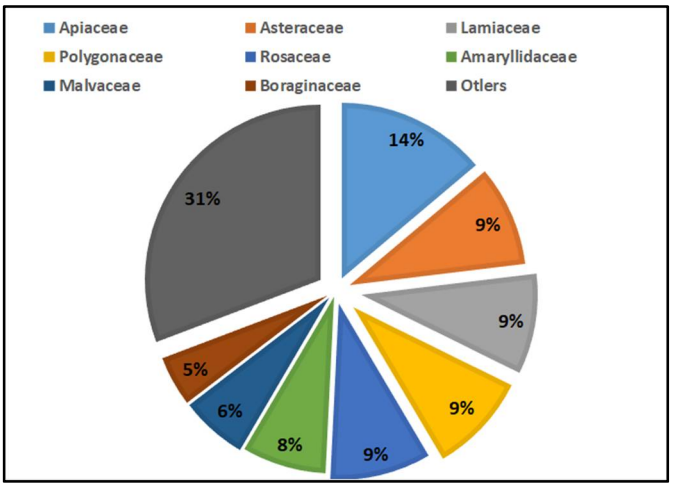

Fig. 2. The percentages of the used plant families

The cooked plant consumption

The largest category of wild edible plants used by local people in Hizan belongs to the cooked vegetables (29 taxa). This is consistent with the studies conducted in eastern Anatolia (Mükemre *et al*., 2016; Kaval *et al*., 2015; Polat *et al.*, 2017; Özçelik 1994). The use of plants in this category generally very as they are widespread. It can be said that they can grow in almost every habitat (roadside, field etc.). However, most of these plants are harmful, i.e. perform as weed in agricultural areas (Tepe, 2014). In the spring, some taxa are freshly picked, boiled and drained, and then they are usually cooked with eggs, or eaten with yogurt (*Centaurea solstitialis* L., *Anchusa azurea* Miller, *Chenopodium album* L., *Papaver clavatum* Boiss. & Hausskn. Ex Boiss. *Rumex angustifolius* subsp. *macranthus* (Boiss.) Rech. f., *Malva neglecta* Wallr., *Eremurus spectabilis*M. Biebetc.). Fresh leaves of some taxa are used as packaging material in "sarma" (*Alcea flavovirens* (Boiss. &Buhse) Iljin, *Alcea remotiflora* (Boiss. & Heldr.) Alef., *Rumex tuberosus* L. subsp. *horizontalis* (Koch.) Rech, *Rumex patientia* L.). Some are dried and stored. Some dried plants are consumed in pilaf or added to soup, especially in winter. (*Allium akaka* L., *Arum rupicola* Boiss, *Puschkinia scilloides* Adams, *Silene vulgaris* (Moench) Garcke, *Satureja macrantha* C.A. Mey. and *Urtica dioica* L.). The fresh shoots of the *Gundelia tournefortii* L. and *Ferula orientalis* L. species, which are widely consumed in Bitlis region, are picked and corned, and then stored for winter use.

The plants used in cheese making

There are extensive sheep and goat breeding in Hizan County. The milk of sheep and goats fed in high plateaus is generally used in cheese making, and edible wild plants are a part of this agricultural activity. The cheese made with various wild edible plants is called "herby cheese". Many taxa have been used in cheese production in Eastern Anatolia for centuries. In Turkey, herby cheese is produced only in the East Anatolian provinces: Van, Bitlis, Siirt, Hakkari, Bingöl and Tunceli (Özçelik, 1994). In spring, many taxa are collected from the high plateaus and added

Table 1. Edible parts, utilization methods and use values of wild edible food plants in Hizan County of Bitlis, Turkey.

Family	Plant species, Vouchers numbers	Vernacular name	Edible parts	Utilization methods	VU
Amaranthaceae	*Amaranthus retroflexus* L. İ.D. 2020	Tendernik	Aerial parts	Cooked as a vegetable	0.38
Amaryllidaceae	*Allium akaka* L. İ.D. 2037	Guhbızınok	Leaves	Cooked as a vegetable in bulgur pilaf	0.35
Amaryllidaceae	*Allium kharputense* Freyn & Sint İ.D. 2039	Soryaz	Aerial parts	Cooked as a vegetable in bulgur pilaf	0.41
Amaryllidaceae	*Allium scorodoprasum* subsp. *rotundum* (L.) Stearn İ.D. 2041	Kurad	Aerial parts	Used in cheese production	0.47
Amaryllidaceae	*Allium vineale* L. İ.D. 2025	Sirik	Wholeplant	Used in cheese production	0.51
Anacardiaceae	*Pistacia khinjuk* Stocks İ.D. 2024	Kızvan	Fruits	Used for making coffee /gum and cheese production	0.60
Apiceae	*Chaerophyllum bulbosum* L. İ.D.2042	Xitik	Aerial parts	Cooked with egg	0.38
Apiceae	*Chaerophyllum crinitum* Boiss İ.D. 2055	Xitik	Aerial parts	Cooked with egg	0.30
Apiceae	*Chaerophyllum macrospermum* (Sprengel) Fisch. &C.A. Mey. İ.D.2026	Mend	Aerial parts	Used in cheese production or cooked with egg	0.29
Apiceae	*Eryngium billardierei* F.İ.D. 2042	Tüsü	Freshshoots	Eaten raw	0.39
Apiceae	*Ferula orientalis* L. İ.D. 2048	Jağ	Freshshoots	Cooked with egg	0.57
Apiceae	*Heracleum crenatifolium* Boiss. İ.D. 2066	Sov	Freshshoots	Used in cheese production	0.51
Apiceae	*Heracleum persicum* Desf. İ.D. 2029	Sov	Freshshoots	Used in cheese production	0.52
Apiceae	*Pimpinella affinis* Ledeb. İ.D 2079	Agirok	Root	Used in rennet production	0.27
Apiceae	*Pimpinella kotschyana* Boiss.İ.D. 2062	Hêro	Root	Used in rennet production	0.52
Araceae	*Arum rupicola* Boiss. İ.D. 2050	Kari	1. Bulbs 2.Leaves	1. Used in rennet production 2.Cooked as a vegetable in bulgur pilaf	0.41
Asparagaceae	*Puschkinia scilloides* Adams İ.D. 2027	Serhişing	Aerial parts	Cooked as a vegetable in bulgur pilaf; Cooked as a stew vegetable with yogurt	0.57
Asteraceae	*Centaurea solstitialis* L. İ.D. 2028	Sitirok	Aerial parts	Cooked as a vegetable	0.22

Family	Plant species, Vouchers numbers	Vernacular name	Edible parts	Utilization methods	VU
Asteraceae	*Echinops phaeocephalus* Hand.-Mazz.İ.D. 2070	Ser topız	Receptakul um	Eaten fresh; fresh plant is eaten after peeling off the outer part	0.26
Asteraceae	*Gundelia tournefortii* L. İ.D. 2045	Kereng zer	Aerial parts,	Cooked as with egg; used in cheese production; used as gum production	0.66
Asteraceae	*Scorzonera latifolia* (Fisch. &C.A. Mey.) DC. İ.D. 2060	Nêrebend	Stems	Used as gumproduction	0.23
Asteraceae	*Scorzonera veratrifolia* Fenzl İ.D. 2071	Nêrebend	Stems	Used as gum production	0.22
Asteraceae	*Tragopogon buphthalmoides* var. *latifolius* Boiss. İ.D. 2072	Spıng	Freshleaves	Eaten fresh with salt	0.30
Betulaceae	*Corylus avellana* L. İ.D 2076	Bındeq	Fruit	Used in rennet production	0.26
Boraginaceae	*Anchusa azurea* Miller. var. *azurea* İ.D. 2028	Gurız	Aerial parts	Cooked as with egg	0.58
Boraginaceae	*Anchusa azurea* Miller. var. *kurdica* İ.D.2034	Gurız	Aerial parts	Cooked as with egg	0.42
Boraginaceae	*Echium italicum* L. İ.D. 2016	Gurüzok	Aerial parts	Cooked as with egg	0.30
Brassicaceae	*Barbarea vulgaris* R.Br. İ.D. 2056	Tuzık	Aerial parts	Eaten fresh or in salad	0.22
Brassicaceae	*Capsella bursa-pastoris* (L.) Medik. İ.D. 2047	Kıçi	Aerial parts	Eaten fresh	0.26
Caryophyllaceae	*Silene vulgaris* (Moench) Garcke İ.D. 2038	Nermedev	Aerial parts	Cooked as with egg	0.64
Chenopodiaceae	*Chenopodium album* subsp. *album* var. *album* İ.D. 2021	Berbezük	Aerial parts	Plant is with yogurt	0.32
Chenopodiaceae	*Chenopodium foliosum* (Moench.) Aschers İ.D. 2073	Tıryê rıvi	Fruits	Eatenf resh	0.20
Fabaceae	*Cicer arietinum* L. İ.D 2077	Noq	Fruit	Used in rennet production	0.52

Family	Plant species, Vouchers numbers	Vernacular name	Edible parts	Utilization methods	VU
Fagaceae	*Quercus infectoria* Oliv. İ.D. 2051	BerüyeHırçe	Nuts	Eaten Fresh or cooked	0.29
Lamiaceae	*Mentha longifolia* (L.) Huds. subsp. *longifolia* İ.D. 2022	Pung	Aerial parts	As spice; plant is with yogurt;	0.52
Lamiaceae	*Origanum vulgare* subsp. *gracile* (K. Koch) Ietsw. İ.D. 2018	Cantırareş	Aerial parts	As spice; used in cheese production	0.45
Lamiaceae	*Salvia virgata* Jacq. İ.D. 2058	Celeka Sor	Freshleaves ,	Cooked as vegetable;	0.20
Lamiaceae	*Satureja macrantha* C.A. Mey. İ.D. 2065	Reyhana çiya	Aerial parts	As spice; cooked as a with egg	0.39
Lamiaceae	*Thymus fedtschenkoi* Ronniger İ.D. 2049	Catır	Freshleaves	As herbaltea; as spice; used in cheese production	0.36
Lamiaceae	*Thymus kotschyanus* Boiss. &Hohen var. *glabrescens* İ.D. 2074	Catır	Freshleaves	As herbaltea; as spice; used in cheese production	0.38
Malvaceae	*Alcea flavovirens* (Boiss. &Buhse) Iljin İ.D. 2030	Gul	Freshleaves ,	As a wrapping material for sarma	0.26
Malvaceae	*Alcea remotiflora* (Boiss. &Heldr.) Alef. İ.D. 2031	Gul	Freshleaves ,	As a wrapping material for sarma	0.22
Malvaceae	*Malva neglecta* Wallr. İ.D. 2033	Tulık	Aerial parts	Cooked as a vegetable	0.61
Malvaceae	*Malva sylvestris* L. İ.D. 2035	Çirik	Aerial parts	Cooked as a vegetable	0.44
Moraceae	*Ficus carica* İ.D. 2069	Hejir	Leaves	Used as yogurt yeast	0.20
Papaveraceae	*Papaver clavatum* Boiss. &Hausskn. Ex Boiss. İ.D. 2054	Pepiko	Aerial parts	Cooked as a vegetable with egg	0.23
Plantaginaceae	*Plantago lanceolata* L.İ.D. 2014	Takeş	Aerial parts	Eaten raw with salt	0.30
Plantaginaceae	*Plantago major* L.İ.D. 2015	Heyiso	Aerial parts	Eaten raw with salt	0.38
Portulacaceae	*Portulaca oleracea* L. İ.D. 2017	Parpar	Aerial parts	Cooked as a vegetable or leaves are added to the salad	0.55

Family	Plant species, Vouchers numbers	Vernacular name	Edible parts	Utilization methods	VU
Polygonaceae	*Rheum ribes* L. İ.D. 2044	Rıbes	Freshshoots	The outer part is freshly eaten after peeling	0.70
Polygonaceae	*Rumex crispus* L. İ.D. 2013	Tırşung	Aerial parts	As seasonings	0.44
Polygonaceae	*Rumex patientia* L İ.D. 2032	Avilok	Aerialparts,	As a wrapping material for sarma	0.38
Polygonaceae	*Rumex scutatus* L. İ.D. 2040	Tırşungaçiya	Aerial parts	Leaves eaten in salads	0.42
Polygonaceae	*Rumex tuberosus* L. subsp. *horizontalis* (Koch.) Rechİ.D. 2019	Tırşung	Aerial parts	As a wrapping material for sarma	0.38
Polygonaceae	*Rumex angustifolius* subsp. *macranthus* (Boiss.) Rech.f. İ.D. 2068	Bėjek	Aerialparts	Cooked as a vegetable	0.26
Poaceae	*Hordeum bulbosum* L İ.D. 2067	Giyareş	Bulbs	Eaten fresh	0.20
Poaceae	*Triticum aestivum* L. İ.D 2078a.	Genım	Fruit	Used in rennet production	0.44
Rosaceae	*Crataegus azarolus* L. İ.D. 2075	Gühüjaspi	Fruits	Eaten fresh	0.29
Rosaceae	*Crataegus monogyna* Jacq. İ.D. 2061	Gühüj	Fruits	Eaten fresh	0.27
Rosaceae	*Crataegus x sinaica* Boissİ.D. 2053	Gühüj	Fruits	Eaten fresh	0.20
Rosaceae	*Crataegus curvisepala* Lindm. İ.D. 2064	Gühüj	Fruits	Eaten fresh	0.23
Rosaceae	*Rosa canina* L. İ.D. 2036	Masürük	Fruits	As herbal tea or eaten fresh	0.64
Rosaceae	*Rubus idaeus* L. İ.D. 2057	Tütürk	Fruits	Eaten fresh	0.38
Urticaceae	*Urtica dioica* L. İ.D. 2023	Geznık	Aerial parts	Cooked as a vegetable	0.63
Xanthorrhoeaceae	*Eremurus spectabilis* M.Bieb İ.D. 2043	Gulık	Aerial parts	Cooked as a vegetable	0.55

to cheese. The milk used in cheesemaking is not boiled. These plants are probably used for antibacterial and aroma agent. It is found that plants such as *Allium vineale* and *Chaerophyllum macropodum* used in cheese making had antibacterial activity against the Gram-positive and Gram-negative bacteria (Durmaz *et al.*, 2006). Nine taxa have been identified in this category in study area. *Allium scorodoprasum* subsp. *rotundum* (L.) Stearn, *A. vineale* L., *Pistacia khinjuk* Stocks, *Chaerophyllum macrospermum* (Sprengel) Fisch. & C.A. Mey., *Heracleum crenatifolium* Boiss. and *H. persicum* Desf. taxa are used in cheese making in Hizan county. However, fresh leaves of *Origanum vulgare* subsp. *gracile* (K. Koch) Ietsw., *Thymus fedtschenkoi* Ronniger, and *Thymus kotschyanus* Boiss. & Hohen var. *glabrescens*are are chopped and used directly.

Those used as dairy products yeast

Intensive cheese production has concurrently brought out the need for rennet. In ancient times, people were making their own rennet themselves. The local people started to use commercial yeasts with the developments in transportation. However, the old method of making rennet in Hizan continues rarely (Fig. 3B). Milk can coagulate by using coagulating enzymes which are naturally found in some plants (Say and Güzeler, 2016). For this purpose, in Hizan county, *Pimpinella affinis* Ledeb., *Pimpinella kotschyana* Boiss. and *Arum rupicola* Boiss, *Cicer arietinum* L., *Corylus avellana* L. and *Triticum aestivum* L. are used. In addition, ficus extract dripped into milk is used to ferment the milk. Figs contain two groups of proteolytic enzymes (Fadıloğlu, 2001; Akar and Fadıloğlu, 1999).

Fig. 3. A. Preparation of Bıttım coffe, B. Preparation of rennet by old methods,

The consuming plants as raw (salad etc.)

Sixteen taxa assessed in this category have been identified. These plants, usually collected in spring, are consumed freshly in the form of snacks. The fresh stem of the plant *Rheum ribes* L. and *Eryngium billardierei* F. is eaten peeled. *Rheum ribes* is consumed too much across Eastern Anatolia (Mükemre *et al.*, 2016; Kaval *et al.*, 2015; Polat *et al.*, 2015). It is also an important plant used in medicine. They are medically important due to the content of anthracene derivatives within the subterranean parts of the plants (Öztürk *et al.*, 2007). The aerial parts of *Tragopogon buphthalmoides* var. *latifolius* Boiss., *Capsella bursa-pastoris* (L.) Medik., *Plantago lanceolata* L. and *P. major* L., are eaten as a snack with salt. Numerous authors claim the *Plantago* species can be used for human nutrition (Toussaint-Samat, 1991; Kunkel, 1983; Polunin 1977; Quer 1990).).

Plantago species are also eaten in Anatolia especially for stomach ailments (Dalar *et al.*, 2012). Children like and eat the sweet roots of the plant *Hordeum bulbosum* L. Crataegus species and *Rubus idaeus* L. fruits are also consumed fresh. The fresh leaves of *Barbarea vulgaris* R.Br., *Portulaca oleracea* L., *Rumex scutatus* L. are used in salad.

Beverages

The shelled fruits of *Pistacia khinjuk* Stocks plant, which is spread naturally especially on the southern sides of the county, are collected and selected. Next, it is browned in a wood fire and then crushed to make a molasses-like consistency. This beverage, called "Bıttım" coffee, is consumed with and without milk as coffee (Fig. 3A). Use of this coffee is common in the areas where the plant *Pistacia* spreads naturally (Kaval *et al.*, 2014; Yeşil and İnal 2019; Yeşil *et al.*, 2019). *Pistacia* has been known for its medicinal properties since ancient times. They have played important roles in folk medicine and are used in eczema treatment, anti-inflammatory, stomach ache, asthma, as an antibacterial and antiviral (Tohidi *et al.*, 2011). *Rosa canina* L. fruits are collected in the summer months and dried, consumed as an antitussive especially by children in winter. *Thymus fedtschenkoi* Ronniger and *Thymus kotschyanus* Boiss. & Hohen var. *glabrescens* taxas, collected and dried up in the summer, are consumed as a kind of tea in winter.

The consumption as spice

Fresh leaves and shoots of *Mentha longifolia* (L.) Huds. subsp. *longifolia*, *Origanum vulgare* subsp. *gracile* (K. Koch) Ietsw., Satureja *macrantha* C.A. Mey., *Thymus fedtschenkoi* Ronniger, *T. kotschyanus* Boiss. & Hohen var. *glabrescens* and *Rumex crispus* L. collected in the spring are dried and used as a spice to add flavor to soup and some meat dishes in the winter.

Gums

The gum is made with latex obtained from the stem of the belonged to 4 species. These are; *Pistacia khinjuk* Stocks, *Gundelia tournefortii* L., *Scorzonera latifolia* (Fisch. & C.A. Mey.) and *S. veratrifolia* Fenzl. Gum is produced with latex obtained by scratching the trunk of the *Pistacia khinjuk* Stocks tree. The stems of *Gundelia tournefortii* L., *Scorzonera latifolia* (Fisch. & C.A. Mey.) DC and *S. veratrifolia* Fenzl. are cut off, and their plant sap is poured on dry ground, then dried, so gum is obtained.

Characteristics of participants

Table 2 shows the demographic characteristics of participants. A total of 110 participants (62 men and 48 females) were interviewed face-to-face. The majority of the participants (40.0 percent) were 50 years old or older. The number of young participants was quite low (10.0 percent). This shows that traditional knowledge does not pass from the elderly to the late generations and this cultural heritage is in danger of being forgotten. Therefore, it is very important to preserve this traditional knowledge before it is lost. The majority of the participants (41.8 percent) were primary school graduates and illiterate (39.0 percent). The number of university graduates was almost negligible (3 people). All women participants are housewives (62 people) men participants are generally farmers (29 people).

Vernacular names of plants in Hizan

The vernacular names of plants used in Hizan are derived from Kurdish language. It has been found that the local names of some commonly used plants are almost identical to those used near the study area. For example, *Rheum ribes* L. (Rewas, rıbez), *Eryngium billardieri* F. (Tüsü) and *Urtica dioica* L. (Gezınk, Dezınk) (Mükemre *et al.*, 2016; Kaval *et al.*, 2014; Kasımoğlu and Dirihi 2013). However, some locally used names are specific to Hizan, such as *Amaranthus*

retroflexus L. (Tendernik), Quercus *infectoria* Oliv. (Berüyê hırçê) and *Plantago major* L. (Heyiso).

Table 2. Classification of participants according to their demographic features.

Total people	Man/women	Number of people	Percent (%)
Gender	Women	62	56.3
	Men	48	43.7
Ages	30 and less than 30	11	10.0
	Between 31 and 40	23	21.0
	Between 41 and 50	32	29.0
	Over 50	44	40.0
Level of education	Illiterate	43	39.0
	Elemantary school	46	41.8
	Secondary school	11	10.0
	High school	7	6.4
	University	3	2.8
Employment	Farmer	29	26.4
	Housewife	62	56.3
	Others	19	17.3

Data analysis

Rheum ribes L. (UV: 0,70), *Gundelia tournefortii* L. (0,66), *Silene vulgaris* (Moench) Garcke and*Rosa canina* L. (0,64), *Urtica dioica* L. (0,63), *Malva neglecta* Wallr. (0,61), *Pistacia khinjuk* Stocks (0,60), *Anchusa azurea* Miller. var. *azurea* (0,58), *Ferula orientalis* L. and *Puschkinia scilloides*Adams (0,57) were reported to be of the highest use value.

This study was done to record information about plants used as food by local people living in Hizan County (Bitlis). Thus, ethnobotanical information of 65 taxa belonging to 24 families was recorded with details. In addition, participants' information was recorded. A culture of edible plant use is widespread throughout the Hizan County. However, it is understood that this culture has not been passed much to younger generations since the people giving information are generally 50 years of age or older. Young men in particular often migrate to large cities to find a job. Few numbers of young people living in the villages do not care much about this traditional knowledge. Thus, it signals that the number of people with this information is decreasing day by day and that this traditional information is in danger of disappearing. It is very important to record all ethnobotanical information from the study area as soon as possible. Therefore, this research has made an important contribution to the preservation of the cultural heritage associated with traditional wild edible plants in this region.

Acknowledgement

I thank all knowledge providers for sharing their valuable information and reviews with me, and to BEBAP [Office of Scentific Research Projects of Bitlis Eren University), Bitlis/Turkey (Projectno: 2018.07)] who supported this research financially.

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(Manuscript received on 28 February, 2020; revsied on 13 November, 2020)