



Celebrating Multi-Religious Co-Existence in Central Kurdistan: the Bio-Culturally Diverse Traditional Gathering of Wild Vegetables among Yazidis, Assyrians, and Muslim Kurds

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Abstract

An ethnobotanical field study focusing on traditional wild vegetables was conducted in 22 villages of Central Kurdistan among three ethno-religious groups: Yazidis, Christian Assyrians, and (Sunni) Muslim Kurds. Through 91 interviews with elderly informants, we recorded the folk uses of 54 identified botanical taxa. We also observed important differences among these three groups in the use of wild vegetables that reflect the historical prevalence of pastoralism versus horticulture among Kurds and Assyrians, respectively. The preservation of the peaceful co-existence of different cultural and religious groups in the study area is crucial for the maintenance of the rich wild plant food local heritage.

Keywords Ethnobotany · Pastoralism · Horticulture · Kurdistan · Wild vegetables · Kurds · Yazidis · Assyrians

Introduction

Kurdistan is an important region for human ecological and ethnobiological research, as it is home to significant archaeological sites tracing the history of plant use, notably Shanidar and Jarmo (Braidwood 1950; Braidwood *et al.* 1983; Leroi-Gorhan 1975; Lietava 1992), and is located at the crossroads of four important cultural areas (Turkish, Arabic, Persian, and Caucasian). In addition, the region still has diverse ethnic, linguistic, and religious minority groups who have lived peacefully together for centuries.

The wild food ethnobotany of territories inhabited by Kurds has been little investigated to date, with only a few sporadic field studies carried out in Eastern Turkey (Kaval *et al.* 2015; Polat *et al.* 2015, 2017), Northern Iraq (Ahmad and Askari 2015; Pieroni *et al.* 2017), Western Iran (Maassoumi and Bobrov 2004), and Armenia (Hovsepian *et al.* 2016). These few studies, however, have clearly shown that the diversity of wild vegetables used is extraordinarily high among Kurds compared with nearby populations in the Near/Middle East. For example, a recent cross-cultural field survey on the wild plants used as wrapping material for preparing the dish *sarma* have shown that the largest diversity of used species was found in Eastern Turkey (Turkish Kurdistan; Dogan *et al.* 2015; Dogan *et al.* 2017).

Moreover, there are few field studies addressing the role played by religious affiliation in shaping traditional environmental knowledge (TEK) have been scarce worldwide, although those that have been conducted have underlined the crucial role played by religion, for example at the interface between Muslim and Christian communities in the Balkans (Pieroni *et al.* 2011; Rexhepi *et al.* 2013), possibly because of its importance in shaping kinship relations and consequently the transmission of TEK and related domestic practices.

In this study we focus on Central Kurdistan (occupying today the northern part of Iraq), a largely mountainous area predominantly inhabited by three ethno-religious groups (Yazidis, Assyrians, and Muslim Kurds), in order to cross-

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culturally compare the possible effect of religious divides on the local use of wild vegetables.

Our specific research objectives were:

1. to record the local names and specific traditional culinary uses of local wild vegetables, which are gathered in the study area during the spring;
2. to compare the data collected among the three religious/ethnic communities; and
3. to compare the data with the available Middle Eastern and Mediterranean wild food ethnobotanical literature in order to identify commonalities and differences in specific uses that could be linked to historical and/or socio-ecological dynamics.

Methods

Research Area and Field Study

The field study was conducted in Central Kurdistan (Northern Iraq) in the spring of 2017, during which time we visited 22 villages and centres (Fig. 1) inhabited by Yazidis, Christian Assyrians (both Catholic Chaldeans and Oriental Orthodox Christians), and Muslim (Sunni) Kurds (Fig. 1), with one village (Bozan) inhabited by Yarsanis (Ahl-e Haqq). Apart from the towns of Rawanduz (Fig. 2) and Alqosh (with approximately 95,000 and 10,000 inhabitants, respectively), which represent crucial centres in the history of Central Kurds and Chaldeans, all other communities visited were villages with populations between roughly 100 and 1000 effective inhabitants, and most of them were mountain or pre-mountain villages ranging from approximately 450 m.a.s.l. (Shex Xadre) to 1350 m.a.s.l. (Harisa and Rust). A few of the Yazidis we interviewed in several villages south of Duhok were not native, but had moved into the study area in 2015–2016 after escaping the tragedy of the genocide perpetrated by the Islamic State in their home area of Sinjar, about 200 km to the west. In addition, we visited a few informal wild vegetable stalls/markets in the centres of Spilka, Shelandiz, Rawanduz, and Duhok.

All three religious communities are autochthonous to Kurdistan and strictly endogamic: both Muslim Kurds and Yazidis speak Kurdish.

Yazidism is a very ancient, monotheistic religion possibly based upon Zoroastrianism (Kreyenbroek 1995; Acikyildiz 2010; Omarkhali 2014); however, the number of its adherents has dropped dramatically in very recent years because of the genocide perpetrated by the Islamic State and the consequent move of many survivors to Europe. Assyrians on the other hand are Christians (both Chaldean Catholics and Eastern Orthodox Christians) who

claim to descend from the ancient Assyrian civilization (Petrosian 2006) and speak Neo-Aramaic, which is considered threatened by the Summer Institute of Linguistics (SIL) (Simons and Fennig 2017).

The vegetation of our study area belongs to the Armeno-Iranian Province of the Irano-Turanian Region (Takhtajan 1986) and, according to the Köppen-Geiger classification system (Köppen and Geiger 1961), presents a cold, semi-arid climate. The villages we visited have small-scale horticultural and pastoralist economies, with a specific focus on the cultivation of fruit trees (especially grapes for raisins, figs, and drupe fruits) and vegetables, the gathering of wild vegetables, as well as trade of dairy products.

Most locals we interviewed were fluent in the Kurmanji dialect of Kurdish (with the exceptions of residents of Rawanduz, Rust, and Spilka, where Sorani Kurdish was primarily spoken), while Assyrians were fluent in both Aramaic (their mother tongue) and Kurmanji Kurdish.

Ninety-one elderly and mid-aged informants were interviewed: 51 men and 40 women comprising 29 Assyrians, 29 Muslims, 31 Yazidis, and two Yarsanis, who we grouped together with Yazidis given their very close socio-religious relations. All informants have or had a strong link to traditional agro-pastoral activities and still actively practise the custom of gathering wild vegetables.

The focus of the interviews, which were conducted in Kurdish with the aid of one interpreter, was the folk knowledge (local name, modalities of gathering, and detailed culinary use) of wild vegetables or other wild food plants collected during the spring months.

The wild plant species mentioned by the informants were collected, when available, and identified by the first and fourth authors according to the *Flora of Turkey and the East Aegean Islands* (Davis 1965–1988); this resource was chosen because the *Flora of Iraq* is still unfinished (only five completed volumes; Ghazanfar 2017).

The collected specimens were stored in the Estonian University of Life Sciences herbaria (TAA), assigned herbarium numbers within the range TAA0140897–TAA0140963, and also bearing numbers KURD01–059. Nomenclature follows the standards set by The Plant List database (The Plant List 2013), while plant family assignments follow the current Angiosperm Phylogeny Group designations (Stevens 2012). Local plant names were given in the Latin alphabet, following basic phonological rules of the Kurdish and Neo-Aramaic languages.

Data Analysis

Collected data were compared with the wild food ethnobotanical literature of Kurdistan (Maassoumi and Bobrov 2004 [Iranian Muslim Kurds]; Kaval *et al.* 2015 [Muslim Kurds]; Ahmad and Askari 2015 [Muslim Hawramani Kurds];

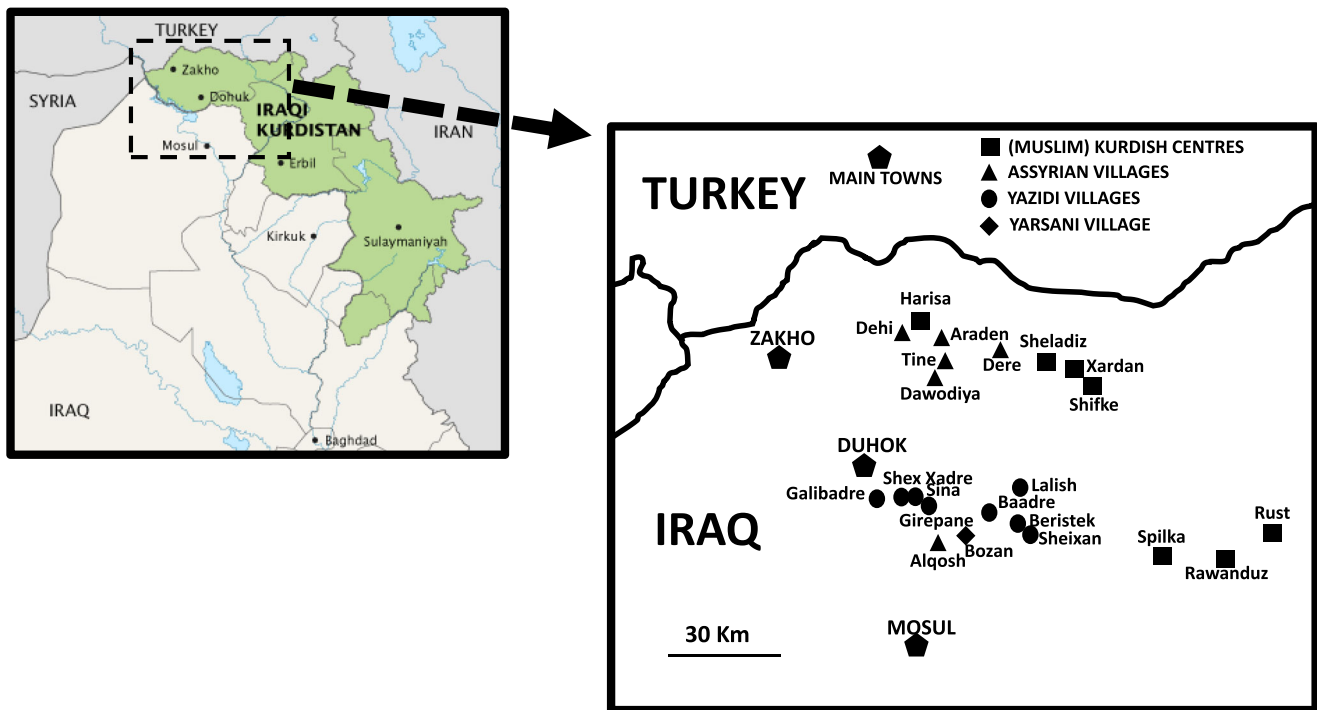


Fig. 1 The study area and visited centres

Polat *et al.* 2017 [Zaza speakers]; Hovsepyan *et al.* 2016 [Yazidis and Muslim Kurds]; Pieroni *et al.* 2017 [Muslim Hawramani Kurds and Yarsani/Kakai Kurds]) and with that of various territories in the Near/Middle East and the Caucasus, where ethnobotanical field studies focusing on wild food plants have been sporadically conducted during the past decades (Cowan *et al.* 1963; Bailey and Danin 1981; Al-Eiswi and

Takruri 1989; Tukan *et al.* 1998; Lev-Yadun 1999; Ertuğ 2000; Abdalla 2004; Keusgen *et al.* 2006; Batal and Hunter 2007; Abbasi *et al.* 2008; Ali-Shtayeh *et al.* 2008; Jeambey *et al.* 2009; Mosaddegh *et al.* 2012; Mayer-Chissick and Lev 2014; Khojimatov *et al.* 2015; Marouf *et al.* 2015; Kaliszewska and Kołodziejaska-Degórska 2015; Polat *et al.* 2015; Busmann *et al.* 2016; Şenkendareş and Tuzlaci 2016; Łuczaj *et al.* 2017).

Fig. 2 Rawanduz and its famous gorge



Table 1 Traditional wild vegetables traditionally gathered and consumed by Yazidis, Assyrians and Kurds in Northern Iraq

Botanical taxon/taxa, family, and voucher specimen code(s)	Recorded local name(s)	Used parts	(Etic) taste and/or smell characteristics	Traditional culinary use	Quotation frequency
<i>Alcea kurdica</i> (Schlecht) Alef (?) and other <i>Alcea</i> spp., Malvaceae	Kobasi*, Xubase*	Leaves	Herbaceous, mucilaginous taste	Wrapping material for <i>sarma</i>	AA
<i>Allium koelzii</i> (Wendelbo) Perss. & Wendelbo, Amaryllidaceae KURD20	Lış, Luş, Luşa	Young leaves	Smell and taste as a mixture of those of garlic, onion and leek	Boiled and fried	K
<i>Allium calocephalum</i> Wendelbo and possibly other <i>Allium</i> spp., Amaryllidaceae KURD15, KURD21 KURD34	Çorin, Çürin, Sir, Sirik, Siriktha*, Sirin, Sorias, Tumanîa*	Leaves	Garlic-like	Raw, seasoning cheese	A, KK, YYY
<i>Allium triquetrum</i> L., <i>A. paradoxum</i> (M. Bieb.) G. Don, (?) and possibly other <i>Allium</i> spp., Amaryllidaceae KURD11	Andreşa, Entriş, Handreşa, Kirate*, Korat*, Kirapso*	Young leaves and inflorescences	Garlic-like	Raw, seasoning, boiled or fried; pickled in vinegar	AA, K, Y
<i>Anchusa azurea</i> var. <i>kurdica</i> (Guşul.) D. F. Chamb. and possibly other <i>Anchusa</i> spp., Boraginaceae KURD25a, KURD45	Gurris, Gurisa Gurs, Tavosra*	Young aerial parts	Herbaceous and slightly mucilaginous taste	Boiled, then fried, eventually eaten with eggs	AA, KK, YYY
<i>Apium nodiflorum</i> (L.) Lag., Apiaceae	Daxle*	Young aerial parts	Aromatic taste, resembling celery	Raw and cooked (consumed especially during the Christian Lent)	AAA
<i>Artemisia scoparia</i> Waldst. & Kitam. (?), Asteraceae	Gioban, Gilbenda*	Aerial parts	Aromatic and bitter taste	Seasoning rice; tea	A, K
<i>Arum italicum</i> Mill. subsp. <i>albispatham</i> (Steven ex Ledeb.) and <i>A. ruficula</i> Boiss., Araceae KURD02 (<i>A. ruficula</i>) KURD09 (<i>A. italicum</i>)	Kari, Kardu, Kardun, Kordi, Kori, Nuta*	Leaves	Pungent and acrid taste (inflaming mucosa)	Boiled and then macerated in “sumac water” (suspension of water and sumac fruits) or water and lemon juice, then consumed, possibly adding tahini sauce, and eventually tomato sauce (Y) or fried; lacto-fermented (Y)	Y K K, K, YYY
<i>Bellis perennis</i> L., Asteraceae	Nofer	Young shoots	Herbaceous taste	Boiled	Y
<i>Bryonia cretica</i> subsp. <i>dioica</i> (Jacq.) Tutin, Cucurbitaceae KURD19	Moraju, Tulaşişa, Turlatırşa	Young shoots	Bitter taste	Boiled and then fried	K
<i>Centaurea calcitrapa</i> L., Asteraceae KURD23	Talishk, Talishika, Kitwastroxa*, Xalidetmarîam*	Young aerial parts	Bitter taste	Boiled; lacto-fermented in water and salt for the winter (Y); decoction used for colouring Easter eggs yellow (A)	AA, YY
<i>Chaerophyllum aureum</i> L., Apiaceae KURD33	Xitek, Xitik	Leaves	Very aromatic, celery-like smell and taste	Cooked	K
<i>Crepis</i> spp., Asteraceae KURD35	Ketwamshîha*	Young aerial parts	Bitter taste	Boiled and fried with onion and eggs	A
<i>Dracunculus vulgaris</i> Schott, Araceae KURD10, KURD28	Kardi, Kardunîkşa, Kari	Leaves	Very pungent and acrid taste (inflaming mucosa)	As <i>Arum</i> spp.	KK, YY
<i>Echium italicum</i> L. and possibly other <i>Echium</i> spp., Boraginaceae KURD45	Lishmataura*, Tavosa*, Tavorza*	Young aerial parts, flowers	Herbaceous and mucilaginous taste	Raw as a snack, boiled, flowers sucked	A
<i>Eremurus spectabilis</i> M. Bieb., Xanthorrhaceae KURD01	Slerk, Silerek, Sterkia,	Young aerial parts	Taste resembling asparagus		KK

Table 1 (continued)

Botanical taxon/taxa, family, and voucher specimen code(s)	Recorded local name(s)	Used parts	(Etic) taste and/or smell characteristics	Traditional culinary use	Quotation frequency
<i>Erodium cicutarium</i> (L.) L'Hér., Geraniaceae KURD54	Peçka, Perkalask, Petalask	Young aerial parts, unripe fruits	Astringent taste	Boiled, sometimes put in sumac water, then cooked with eggs, rice or bulgur	YY
<i>Ferula</i> sp., Apiaceae KURD17	Şirket	Very young leaves	Very aromatic, celery-like smell and taste	Boiled then fried with onion or mushrooms	K
<i>Ferulago angulata</i> (Schldl.) Boiss., Apiaceae KURD52	Boik	Young leaves	Aromatic	Seasoning cheese	K
<i>Foeniculum vulgare</i> L., Apiaceae KURD38	Barxelia*, Braxalia*	Young leaves	Aromatic, characteristic smell and taste	Raw or in alcoholic macerates (liqueurs)	AA
<i>Gundelia tournefortii</i> L., Asteraceae KURD04, KURD18	Karank, Karenk, Kereng, Keninger, Kinget, Lagenet*	Young shoots or upper underground parts	Slightly bitter taste, characteristic crunchiness	Raw as a snack, or boiled, or boiled and then fried; lacto-fermented with salt and possibly also lemon juice (Y, A); considered good for treating cold (K); yogurt-starter in the past (Y)	AA, KKK, YYY
<i>Lathyrus aphaca</i> L., Fabaceae KURD46	Archimama*, Mamejujk*	Young fruits	Pea-like taste	Raw as a snack	A
<i>Malus sylvestris</i> (L.) Mill., Rosaceae	Sef, Seli, Sev	Unripe fruits	Sour and astringent taste	Raw as a snack	KK, YY
<i>Malva neglecta</i> Waller and possibly other <i>Malva</i> spp., Malvaceae KURD03	Hobase*, Hobasi* Hubase*, Tolga, Tolka, Tolk, Tolek, Tollaka, Tollak, Xubase*	Leaves	Herbaceous taste, with a mucilaginous texture	Boiled and then consumed with oil and/or tahini sauce; as a wrapping material for <i>sarma</i> (Y)	AA, KK, YYY
<i>Mentha longifolia</i> (L.) Hudson and <i>M. spicata</i> L., Lamiaceae KURD59, KURD08	Nimxa*, Nana*, Png, Pung	Leaves	Aromatic, characteristic	Raw as a side dish or for seasoning yogurt; used to flavour boiled fava beans (A)	AA, KK, YY
<i>Nasturtium officinale</i> R.Br., Brassicaceae KURD57	Benaf, Kusek, Kurzala, Kirapso*, Kiso*	Young aerial parts	Pungent, rocket-like taste	Raw as a side dish, considered diuretic (K)	AA, KKK, YY
<i>Oenopodium acanthium</i> L., Asteraceae KURD37	Kellandora*	Young shoots	Bitter taste	Raw as a snack	A
<i>Ornithogalum balansae</i> Boiss. and possibly other <i>Ornithogalum</i> spp., Asparagaceae KURD49	Sebesek, Shraitla*, Sharta*	Whole plant	Asparagus-like taste	Boiled, then fried; boiled with bulgur (Y)	AA, KK, YY
<i>Papaver paucifoliatum</i> Fedde, <i>P. macrostomum</i> Boiss. & A.Huet, and possibly other <i>Papaver</i> spp., Papaveraceae KURD34, KURD29	Bibitkalo*, Batanuk, Bukina*, Hornuk	Young leaves	Herbaceous, sweetish taste	Raw or cooked (with sumac); in the past used for washing sheep skin in which cheese was stored (Y)	AA, K
<i>Pistacia khinjuk</i> Stocks, Anacardiaceae	Kazvan, Kaswan, Qazwan	Unripe infructescence	Resinous, mastic-like taste	Raw, as a snack	K, Y
<i>Plantago media</i> L., Plantaginaceae KURD41	Gelledbrine*	Young leaves	Mushroom-like taste	Raw	A
<i>Pleurotus eryngii</i> (DC.) Quéf., Pleurotaceae	Kevorrik, Kewarg, Hanfakirotek	Fruiting body	Slightly spicy smell and sweetish taste	Boiled and then fried in oil or fried	K, Y

Table 1 (continued)

Botanical taxon/taxa, family, and voucher specimen code(s)	Recorded local name(s)	Used parts	(Etic) taste and/or smell characteristics	Traditional culinary use	Quotation frequency
<i>Portulaca oleracea</i> L., Portulacaceae KURD27	Pulplina*	Aerial parts	Mineral and crunchy taste	Raw in salads or cooked	A
<i>Primula</i> spp., Primulaceae	Balazeze	Flowers	Mucilaginous, sweetish	Raw as a snack	A
<i>Prunus armeniaca</i> L., Rosaceae	Kaissi, Qaissi	Unripe fruits	Sour taste, distinctive crunchiness	Raw as a snack	K
<i>Prunus cerasifera</i> Ehrh., Rosaceae	Alu, Halukak, Helik, Xelix*	Unripe fruits	Sour taste	Raw as a snack	AA, KK, YY
<i>Prunus dulcis</i> (Mill.) D. A. Webb, Rosaceae KURD06	Bahif, Boif, Şwala, Shiedhe*, Sengalish, Shieve	Unripe fruits	Sour taste, slightly almond-like, distinctive crunchiness	Raw as a snack	AA, KKK, YY
<i>Prunus microcarpa</i> C. A. Mey., Rosaceae	Gelas, Zardalu	Unripe fruits	Sour taste	Raw as a snack	K
<i>Punica granatum</i> L., Punicaceae	Hanar, Naxre	Unripe fruits	Sour taste	Raw as a snack	Y
<i>Pyrus grossheimii</i> Fed., Rosaceae KURD16	Herme kewi	Unripe fruits	Sour and astringent taste	Raw as a snack	K
<i>Rheum ribes</i> L., Polygonaceae KURD05	Iammisa*, Rewas	Young leaf petioles	Taste: rhubarb-like, differently sweetish and sour depending upon collection spots and age	Raw as a healthy and social snack, often consumed with salt	A, KKK
<i>Rubia tinctorum</i> L., Rubiaceae	Pofa*	Roots	–	Decoction used for colouring Easter eggs yellow/orange	A
<i>Rumex acetosa</i> L., Polygonaceae KURD14, KURD50	Hamisok*, Hamiz*, Perpar, Torşaka, Torşok, Turşik	Young leaves	Sour taste	Raw, seasoning cheese (Y), fermented, perceived as a source of vitamins	A, KK, YY
<i>Salvia forskaohlei</i> L., Lamiaceae, KURD31	Gablapi, Gavlapı, Kavlapır	Leaves	Slightly bitter and aromatic taste	As a wrapping material for <i>sarma</i>	KK
<i>Satureja</i> spp., Lamiaceae	Jate, Jatra, Jatre* Zatra*	Aerial parts	Aromatic, characteristic smell and taste	Seasoning yogurt and <i>sarma</i> filling	AA, KK, Y
<i>Silybum marianum</i> (L.) Gaertn., Asteraceae KURD22	Belxo*, Kangroşek, Karvaş, Kengreşk, Kevar, Kellendur, Kivar, Kivara, Qivar	Stem and roots	Slightly bitter taste	Raw as a snack; lacto-fermented (Y); cooked one day, eaten on another (Y), boiled with sumac as dyeing agent for Easter eggs (A)	A, KK, YYY
<i>Sinapis alba</i> L. and <i>S. arvensis</i> L., Brassicaceae KURD55, KURD26	Fajele*, Fadele* Gabil, Gardala, Gulak, Hardela, Kabar, Kabel, Xardal, Xardaluk, Xardele	Young aerial parts	Pungent taste	Raw or boiled; lacto-fermented (Y); sometimes considered good for stomach-aches (K)	AA, K, YYY
<i>Smyrniun cordifolium</i> Boiss., Apiaceae KURD31	Haladus, Xaladus	Stems	Aromatic smell and taste, resembling angelica	Raw as a snack	K
<i>Terfezia</i> spp., Terfeziaceae	Kim, Kuma, Kumar, Kumb, Chema*	Fruiting body	Mushroom-like taste	Soaked in water, then fried with onions or roasted	K, YYY
<i>Tragopogon porrifolius</i> L., Asteraceae KURD30	Hamza*	Young shoots	Sweetish, crunchy taste	Raw as snack, also as food-medicine (agamst stomach-ache)	A
<i>Trifolium</i> spp., Fabaceae	Baxatli, Basalia*, Karaslina*, Koraslina*	Young inflorescences Leaves	Pea-like taste	Raw or cooked	A, Y A

Table 1 (continued)

Botanical taxon/taxa, family, and voucher specimen code(s)	Recorded local name(s)	Used parts	(Etic) taste and/or smell characteristics	Traditional culinary use	Quotation frequency
<i>Urtica dioica</i> L. and possibly other <i>Urtica</i> spp., Urticaceae			Herbaceous and mineral taste	Cooked and as wrapping material for <i>sarma</i>	
<i>Veronica anagallis-aquatica</i> L., Plantaginaceae	Armontia*, Armotetmia*	Young aerial parts	Herbaceous and watery taste	Raw and cooked (consumed especially during the Christian Lent)	AAA
<i>Vicia narbonensis</i> L., Fabaceae KURD46	Bazalia*	Young fruits	Pea-like taste	Raw as a snack	A
Unidentified Asteraceae sp. KURD51	Permiş, Strizarek, Trizerk	Stem	Light bitter taste	Raw and cooked	Y
Unidentified Brassicaceae sp., KURD24	Zerketek, Zrkik	Young aerial parts	Rocket-like taste	Raw as a snack, boiled and then fried with rice	Y
Unidentified Brassicaceae sp.	Baniok*, Jarjir*	Young aerial parts		Raw	A
Unidentified Fabaceae sp.	Javer*, Gazoze*	Young fruits		Raw as a snack	A

(?): identification presumed on the basis of the folk name and references to other ethnobotanical fieldwork; *: local name recorded among Christian Assyrians; (A): Assyrian use; (K): Kurdish use; (Y): Yazidi use; AAA: very commonly used among Assyrians (quoted by more than 40% of the informants); AA: commonly used among Assyrians (quoted by 10–40% of the informants); A: rarely used among Assyrians (quoted by less than 10% of the informants); KKK: very commonly used among Kurds (quoted by more than 40% of the informants); KK: commonly used among Kurds (quoted by 10–40% of the informants); K: rarely used among Kurds (quoted by less than 10% of the informants); YYY: very commonly used among Yazidis (quoted by more than 40% of the informants); Y: commonly used among Yazidis (quoted by 10–40% of the informants); Y: rarely used among Yazidis (quoted by less than 10% of the informants)

Finally, the most comprehensive reviews on wild food plants consumed worldwide (Hedrick 1972; Facciola 1998) and, more specifically, on useful plants in the Near East/Caucasus (Rivera *et al.* 2012) were consulted, as well as a few representative field investigations and reviews on wild vegetables traditionally gathered and consumed in the Eastern, Central, and Western Mediterranean (Atzei 2003; Ertuğ 2004; Tardío *et al.* 2006; Guarrera 2007; Lentini and Venza 2007; Hadjichambis *et al.* 2008; Dogan *et al.* 2013).

Results and Discussion

Diversity of Wild Vegetables

We listed the wild vegetables reported by the informants as commonly consumed during the spring season with the botanical taxa, families, and voucher codes, the folk names that we recorded in the study area, as well as the plant parts used, their traditional culinary uses, and the quotation frequency for each religious group (proportion of the overall informants citing the food use of a given taxon) (Table 1).

In total, 54 identified taxa were recorded. More than half are mainly consumed raw: raw, washed, fresh leafy vegetables and sometimes aromatic plants generally appear on the domestic table of Kurds as a side dish, to be eaten by hand before using flat bread to scoop up the main (meat-based) dish, similar to the practise of eating *sabzi* in Persian cuisine.

Snacking on fresh wild vegetables and especially peeled stalks with or without salt during social activities such as walks, informal conversations, watching TV, etc. was common for both children and adults. A few other wild vegetables are boiled or consumed after they are lacto-fermented, a practice still particularly popular among Yazidis, whereas our Kurdish study participants mainly referred to the lacto-fermentation of a few wild vegetables only as a recollection. Very few recorded plants were used as seasoning ingredients.

In some specific cases (*Arum* and *Dracunculus* spp.) an obligatory detoxification process after boiling was mentioned by interviewees: the leaves are in fact kept in an acidic environment (obtained by using a powdered sour sumac spice mixed with water) in order to remove excess oxalates and the pungent taste, after which they are chopped, mixed with onions and *tahini* sesame paste for consumption (Fig. 3).

Approximately half of the recorded vegetables were also available at informal local markets, thus indicating the persistence and possibly the economic vitality of domestic, small-scale trade of wild vegetables, generally managed by the male members of the community.

More specifically, to our knowledge, a few recorded plants have rarely, or never, been mentioned in the ethnobotanical

literature of the Near/Middle East, most notably *Allium calocephalum*, *Chaerophyllum aureum*, and *Dracunculus vulgaris*.

Differences among the Three Communities

The most cited wild vegetables were represented by young aerial parts of *Allium*, *Apium*, *Arum*, *Anchusa*, *Gundelia*, *Malva*, *Nasturtium*, *Rheum*, *Silybum*, *Sinapis* and *Veronica* species (Table 1, last column); however, these plants were “popular” in a very different manner among the three communities: while *Allium*, *Anchusa*, *Arum*, *Gundelia*, *Malva*, and *Sinapis* spp. were mainly mentioned by Yazidis, *Arum*, *Nasturtium* and *Rheum* spp. prevailed among Muslim Kurds, and *Apium* and *Veronica* spp. among Assyrians.

The young stems of *Rheum ribes* are gathered from the mountains by Kurdish men, brought into villages and homes, as described in many other parts of Kurdistan and the Middle East (see above), and then widely consumed “socially” as a spring snack; this custom is unknown within the food traditions of the Yazidi. And while Assyrians consume a lot of *Apium nodiflorum* during their Christian Lent, the two other communities completely ignore this species, and, similarly, Assyrians never gather *Arum* species.

The least overlap of the gathered data and the Jaccard Indexes (similarity coefficient) is between Muslim Kurds and Christian Assyrians and between Yazidis and Christian Assyrians, possibly due to the different main ecological spaces where wild vegetables are gathered (Fig. 4). Specifically, while Muslim and Yazidi Kurds collect several species growing in the mountains as a result of the predominance of their pastoralist activities in their past subsistence economy, the majority of the wild food plants gathered by Assyrians, traditionally horticulturalists, are synanthropic weeds gathered close to their vineyards and olive orchards. This difference was also outlined by interviewees: when explicitly asked about gathering in the mountains, Assyrians referred only

to Kurds coming to collect wild vegetables from the mountain slopes/outskirts of their villages, while they themselves gathered wild vegetables by foraging mainly around their home-gardens.

This trend is further evident if we compare the data collected in this study with ethnobotanical investigations that focused on wild vegetables gathered in Mediterranean horticultural contexts (see Methods): 71% of the wild vegetables gathered by Assyrians are also gathered in the Mediterranean basin, while this is true for only 52% of the wild vegetables gathered by Yazidis, and 37% of those gathered by Muslim Kurds.

The implication of this finding may be crucial for understanding the dynamics of wild vegetable gathering in post-Neolithic contexts: the custom of gathering wild leafy species, i.e., weeds growing around agricultural fields used for food, is central to the ethnobotany of Assyrians, who claim descent from the ancient civilization of Mesopotamia dating to 2500 BC, and possibly descending from the main actors of the Neolithic Revolution. It is possible to conjecture the Assyrian post-Neolithic wild “foodscape” of different weedy vegetables gathered around cultivated fields may have migrated westwards with the diffusion of agriculture to Anatolia and, later, to the Eastern and Central Mediterranean basin (Guilaine 2017), where the traditional wild Mediterranean diet was, and partially still is, largely based upon the same “Assyrian” weedy vegetables.

Commonalities with Other Kurdish and Middle Eastern Sites

A considerable portion of the recorded species taxa, or at least their genera, in this study had been previously documented as culturally important in the traditional cuisines of other territories inhabited by Kurds, for example, in Eastern Turkey (*Allium*, *Anchusa*, *Arum*, *Chaerophyllum*, *Eremurus*, *Ferula*, *Ferulago*, *Gundelia*, *Malva*, *Portulaca*, *Rheum*, *Rumex*, *Smyrnum* and *Vicia* spp.; Kaval *et al.* 2015; Polat *et al.* 2017). Furthermore, the most quoted

Fig. 3 *Dracunculus vulgaris* leaves sold in the market of Shelandiz and cooked (after being boiled and detoxified with sumac water)



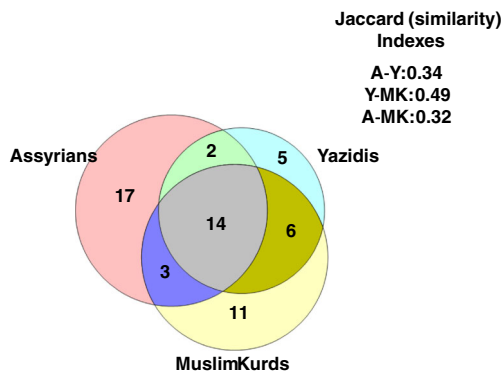


Fig. 4 Overlap of the wild vegetables traditionally gathered by the three studied communities

genera are shared with the Kurdish ethnobotany of Armenia (*Malva* and *Ornithogalum* spp.; Hovsepyan *et al.* 2016), Southern (Hawramani) Iraq (*Allium*, *Anchusa*, *Arum*, *Gundelia*, *Ornithogalum*, *Prunus*, and *Rheum* ssp.; Ahmad and Askari 2015; Pieroni *et al.* 2017) and Western Iran (*Allium*, *Ornithogalum* and *Rheum* spp.; Maassoumi and Bobrov 2004).

Moreover, few wild food taxa commonly cited in our study are well known in the folk cuisines of the Turkish, Arabic, and Jewish Near East (most notably *Arum*, *Eremurus*, *Gundelia*, *Malva*, and *Nasturtium* spp.; Al-Eiswi and Takruri 1989; Tukan *et al.* 1998; Lev-Yadun 1999; Abdalla 2004; Ali-Shtayeh *et al.* 2008; Mayer-Chissick and Lev 2014; Marouf *et al.* 2015; Polat *et al.* 2015), the Assyrian Syrian-Turkish

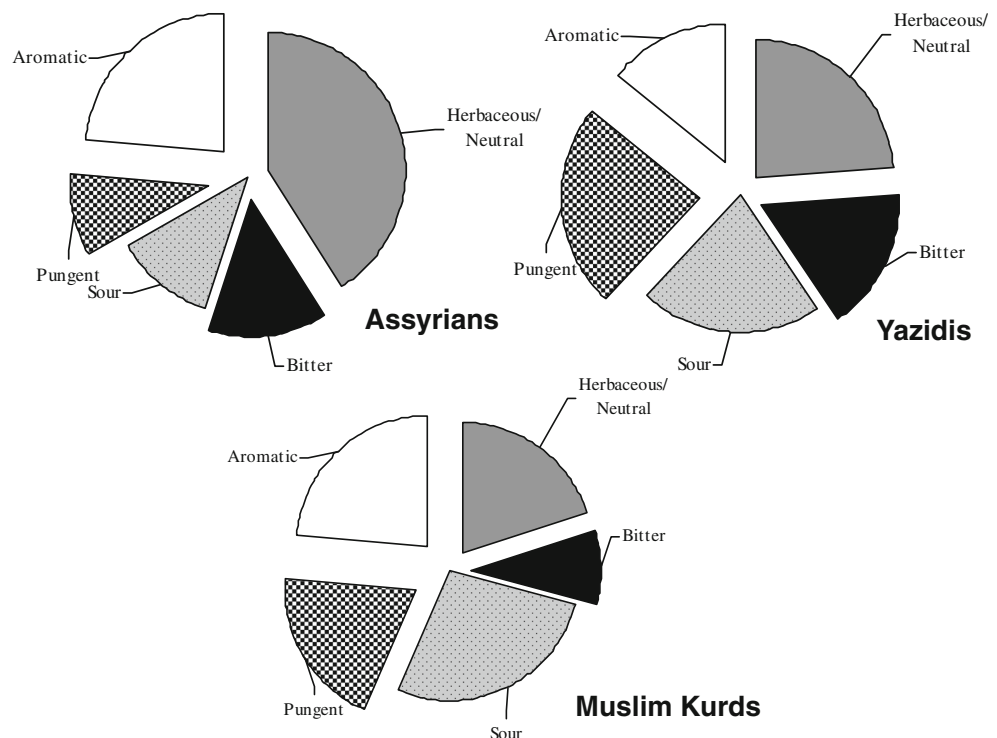
borderland (*Allium*, *Crepis*, *Gundelia*, *Malva*, *Nasturtium*, *Portulaca*, and *Rumex* spp.; Abdalla 2004), as well as in those of Georgia (*Allium*, *Malva*, *Rumex* and *Ornithogalum* spp.; Bussmann *et al.* 2016; Łuczaj *et al.* 2017), Daghestan (*Allium* and *Chaerophyllus* spp.; Kaliszewska and Kołodziejaska-Degórska 2015) and SW Iran (*Allium*, *Eremurus*, *Ornithogalum*, *Prunus*, *Rheum* and *Veronica* spp.; Mosaddegh *et al.* 2012).

Differences in Taste Preferences

In terms of taste perceptions (Fig. 5), the data show that Assyrians tend to prefer *herbaceous/neutral*, *bitter* and *aromatic* wild vegetables, as is also the case, in part, in traditional Mediterranean diets. However, while the predominance of bitter wild vegetables in Mediterranean ethnobotany is unquestionable (Pieroni *et al.* 2002; Lentini and VENZA 2007), Muslim Kurds and Yazidis tend to use more sour and pungent wild vegetables (whereas bitter taste is also popular among Yazidis and aromatic taste among Muslim Kurds).

In sum, differences in the use of wild vegetables among the three communities may be interpreted as the result of a complex interplay of their historically diverse ecological attitudes (Kurdish pastoralism vs. Assyrian horticulture), as well as of different, possibly co-evolved, cultural preferences towards specific plant tastes.

Fig. 5 Predominant tastes of the gathered wild vegetables among the studied groups (data also takes in account their quotation frequency, see Table 1)



Conclusion

Our overall data not only show the permanence of an interesting TEK related to wild vegetables, but also document the local culinary uses of a few poorly known botanical taxa and point out significant divergences among the three religious communities. Moreover, our study calls for further field surveys in surrounding Middle Eastern areas designed to analyse how TEK practices concerning wild vegetables change across time and space. For example, our findings may also be relevant for a better understanding of the diachronic trajectories of the use of wild greens in Mesopotamia and the Middle East from the development of agriculture to the present day.

The bio-cultural heritage presented here should find application in rural development projects aimed at not only promoting small-scale economies, but also celebrating the value of cultural and religious diversities in line with the objectives of the “Law of Protecting Components in Kurdistan” recently approved by the Regional Government of Kurdistan (KRG 2015).

Within this part of the Middle East, which is still coping with recent tragic events but nonetheless hosts a remarkable wild food gastronomic heritage, Kurdistan could represent in the near future the ideal arena for further incorporating ethnobiological data into a broad spectrum of initiatives (such as eco-tourism, small-scale activities of gathering and/or harvesting of local plants, local foods-based farmers’ markets, artisan food entrepreneurship, and related speciality restaurants), which could contribute to the valorisation of Kurdish natural and cultural resources and to improve the holistic well-being of all local communities.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Informed Consent Prior informed Consent was always verbally obtained before each interview and the Code of Ethics of the International Society of Ethnobiology (ISE 2008) was strictly followed.

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