



RESEARCH ARTICLE

Ethnobotany of rural and urban Albanians and Serbs in the Anadrini region, Kosovo

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Abstract Ethnobotanical studies in South-Eastern Europe have gained several scholars' and stakeholders' interest since they are considered crucial for evaluating and valorizing the local bio-cultural heritage. While the Kosovar flora is estimated to comprise more than 2500 species, Kosovo also represents a reservoir of cultural, linguistic, and religious diversities. An ethnobotanical field study was carried out in the spring of 2017 among Albanians and Serbs living in rural and urban environments of the Anadrini region, central Kosovo. The study aimed to assess if

the different ethnic affiliations or rural/urban environments could have affected traditional local plant uses among communities who lived together in the same region over many centuries. The field survey was conducted via semi-structured interviews with 150 local adults chosen among the traditional knowledge holders and focused on traditional uses of wild food and medicinal plants relevant to human or animal health. We recorded and identified a total of 72 plant species belonging to 34 plant families. A comparison between Serbs and Albanians shows a similar number of used plant species/taxa. In contrast, the comparison among rural and urban populations showed that urbanization only affected (decreased) the traditional environmental knowledge retained by Albanians living in Rahovec—who, in response to complex historical trajectories, still speak a Slavic language and possibly adopted very “hybridized” plant-centered customs. This work's findings could be implemented in rural sustainable projects aimed at fostering both environmentally-friendly circular economies and social cohesion.

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Introduction

Kosovo is not only a hotspot of biodiversity but also a hotspot of cultural, linguistic, and religious diversities; thus, it represents an ideal arena for conducting ethnobiological studies aimed at understanding how Traditional Environmental/Ecological Knowledge (TEK) changes and also at implementing TEK into projects focusing on sustainable use of local natural resources. In recent years, the countries of the Western Balkans have been the focus of an impressive, still growing number of ethnobotanical surveys (in Croatia: Pieroni et al. 2003; Pieroni and Giusti 2008; in Bosnia and Herzegovina: Redžić 2006, 2007; Šarić-Kundalić et al. 2010a, b, 2011; in Serbia: Milojević 1988; Jarić et al. 2007; Pieroni et al. 2011; in Montenegro: Menković et al. 2011; in Albania: Pieroni 2008; Pieroni et al. 2005a, b, 2011, 2014a, b; Macedonia: Pieroni et al. 2013, 2014a, b; Rexhepi et al. 2013; Kosovo: Mustafa et al. 2012a, b, 2015, 2020; Hajdari et al. 2018; Pieroni et al. 2017). This trend has been mainly due to the increasing interest of Western countries in finding a market for the purchase of medicinal and aromatic plants (Lange, 1998; Kathe et al. 2003) and in documenting TEK in areas which due to recent history and economic-political currents, are trying to build their future on sustainable uses of natural resources and eco-tourism. However, no studies have addressed the comparison between TEK of plants in rural and urban areas in the Balkans thus far, even though understanding commonalities and differences in this respect may suggest more explicit hypotheses on how botanical knowledge is transferred and diffused. The Anadrini region of Kosovo is rich in biodiversity but still untapped by ethnobotanical studies; this area is mainly inhabited by Albanians and Serbs, whereas urban Albanians in the city of Rahovec have used a peculiar Slavic language for centuries.

This area's population sometimes lacks proper primary health care services, and locals still commonly collect and use wild plants for home-made domestic medical remedies and organic food preparations based on foraged plants. The two primary aims of this study were, therefore: (1) to document the knowledge and uses of traditional wild food and medicinal plants in the Anadrini region and (2) to compare the ethnobotanical data between the different

communities (Albanians vs. Serbs; rural vs. urban populations).

Materials and methods

Study area

Rahovec municipality is a small town located in southwest Kosovo. It is a rural area, inhabited mainly by Albanians (55,166), Serbs (134), Ashkali (404), Egyptian (299), and Roma (84); in total, there are 56,208 inhabitants (Kosovo Agency of Statistics 2011). The Albanians (Muslim) speak a Gegë dialect of the Albanian language, while Serbs (Christian Orthodox) speak the Serbian language. In addition to the Albanian language, many inhabitants of Rahovec also speak Rahovecjançë, which is a community language with the predominance of Slavic linguistic elements (Hoxha 2019). This community language is also known as Ravëqki, Rahovecianshe, and Gjuha e Rahovecit.

Small-scale agro-pastoral activities—especially viticulture—still represent the pillar of subsistence economies for local inhabitants who live in this region. However, many families' economic stability in the study area is dependent upon remittances sent by relatives living abroad. Local populations have been negatively affected by migration due to the displacement of peoples from rural areas to urban areas and abroad. Migration patterns contribute to the rapid decline of TEK of plant species used as medicine, food, and handicrafts; it has also contributed to a decline in the vertical transmission of oral TEK from one generation to another (Mustafa et al. 2015).

Field study

The field survey was conducted in fourteen villages (12 Albanian and 2 Serb) and in the town of Rahovec, Western Kosovo (Latitude: 42° 23' N; Longitude: 20° 37'E) in 2017. Detailed information is presented in Fig. 1 and Table 1. Participants were selected among members of the adult population using the snowball sampling method. Traditional Ecological Knowledge (TEK) was collected using semi-structured interviews. All interviews were conducted in the local language of the communities. In total, 150 local adults were interviewed; of them, 60 female and 90 male (rural



Fig. 1 Map of study site and visited villages

Albanians: 50 female and 30 male; urban Albanians: 20 female and 15 male; rural Serbs: 10 female and 5 male; urban Serbs: 10 female and 10 male). The female age ranged from 32 to 85 years (average 45 years), while the age of the interviewed males ranged from 28 to 80 years (average 40 years).

Participants were asked about local uses of wild food plants; medicinal plants (wild, semi-domesticated, and cultivated) in both the human and the veterinary medicine; semi-domesticated and cultivated food plants used in “unusual” ways (i.e., diverging from what those cultivated plants in Europe are typically used for); edible or medicinal mushrooms. Informed consent from all participants was verbally obtained before conducting interviews, and ethical guidelines prescribed by the International Society of Ethnobiology (ISE 2006) were followed. During the interviews, informants were asked to show the reported plants (fresh or dried) whenever available. Voucher specimens were collected and stored at the

Herbarium of the Biology Department of the University of Prishtina “Hasan Prishtina” (Table 3). Taxonomic identification followed relevant standard botanical literature of the area (Paparisto and Balya 2003; Pajazitaj 2004; Demiri 1981; Tutin et al. 1964). Botanical nomenclature and family assignments followed The World Flora Online (2020) and the Angiosperm Phylogeny Group III (Chase et al. 2016), respectively. Fungal nomenclature follows Mycobank (2020).

Data analysis

Informant consensus factor

The Informant Consensus Factor (F_{ic}) for urban/rural Albanians and urban/rural Serbs calculated. The results are provided for use categories in Table 2. Informant consensus factor was calculated for each category of use, using the following formula:

Table 1 Characteristics of the study participants

Visited sites	Elevation (m.a.s.l.)	Number of inhabitants census 2011		Number of Albanians interviewed		Sex ratio	Age min–max	Language
		Alb.	Ser.	Alb.	Ser.			
<i>Urban area</i>	406	15,467	85	35	15	Alb: 20F, 15M	Alb: 40–85	Rahovec's speech
Rahovec						Ser: 10F, 5M	Ser: 28–50	Serbian
<i>Rural area</i>	326	1852	0	7	0	Alb: 4F, 3M	Alb: 35–73	Albanian
Celinë								
Fortesë	320	2231	0	8	0	Alb: 5F, 3M	Alb: 28–70	Albanian
Hoçë e Vogël	347	1165	0	7	0	Alb: 5F, 2M	Alb: 43–80	Albanian
Hoçë e Madhe	411	75	49	0	20	Ser: 10F, 10M	Ser: 30–67	Serbian
Krushë e Madhe	306	4440	0	8	0	Alb: 4F, 4M	Alb: 38–65	Albanian
Naushpall	387	220	0	6	0	Alb: 5F, 1M	Alb: 42–65	Albanian
Opterushë	408	1905	0	6	0	Alb: 4F, 2M	Alb: 40–68	Albanian
Pataçan i Epërm	445	533	0	6	0	Alb: 3F, 3M	Alb: 35–70	Albanian
Pataqan i Ulët	368	1077	0	7	0	Alb: 4F, 3M	Alb: 42–70	Albanian
Retijë	406	771	0	6	0	Alb: 4F, 2M	Alb: 42–66	Albanian
Sapniq	400	995	0	6	0	Alb: 5F, 1M	Alb: 38–67	Albanian
Xërxe	315	3080	0	7	0	Alb: 3F, 4M	Alb: 32–68	Albanian
Zoqishtë	423	659	0	6	0	Alb: 4F, 2M	Alb: 30–65	Albanian

$$F_{ic} = \frac{N_{uc} - N_t}{N_{uc} - 1}$$

where N_{uc} is the total number of use citations in each category, and N_t is the number of taxa used in this category (Quave and Pieroni 2015). High F_{ic} values (near 1.0) are obtained when one, or few species, is reported to be used by a large proportion of informants for a particular category, whereas lower F_{ic} values indicate that informants disagree over which taxa to use.

Jaccard's similarity index (JI%)

In order to analyses the similarities of the traditional uses of plant species, the Jaccard similarity index were used (González-Tejero et al. 2008), calculated using the following formula:

$$\text{Index of Jaccard} = \frac{C}{A + B - C} \times 100$$

A—is the number of species of sample A; B the number of species of sample B; and C is the number of species common to A and B. This index allows the percentage of similarity to be calculated in each studied group.

Use-value analysis

The use-value citation (UV_c) for urban/rural Albanians and urban/rural Serbs calculated (de Albuquerque et al. 2007). It is determined as the sum of independent use citation reports (U_{is}) for each group and a particular species. This is then divided by the total number of informants within the group (N):

$$UV_c = \frac{\sum U_{is}}{N}$$

This assessment offers insight into the relative importance of each species. To further assess how this importance ranking compares across ethnic groups, we also applied the use-value matrix analysis as previously described (Quave and Pieroni 2015).

Table 2 Comparison of Albanian and Serbs plant use by informant consensus factor (F_{ic}) analysis

	Number of taxa				Number of use citations				Informant consensus factor (F_{ic})			
	U _{Alb}	R _{Alb}	U _{Ser}	R _{Ser}	U _{Alb}	R _{Alb}	U _{Ser}	R _{Ser}	U _{Alb}	R _{Alb}	U _{Ser}	R _{Ser}
<i>Food</i>												
Lactic or Acetic Acid Fermentation	3	1	3	3	13	4	7	7	0.83	1.00	0.67	0.67
Alcoholic Fermentation	0	0	0	1	0	0	0	4	0.00	0.00	0.00	1.00
Jam	2	4	8	2	12	30	17	4	0.91	0.90	0.56	0.67
Savoury pie filling (Pita/Burek)	4	4	6	4	24	22	20	12	0.87	0.86	0.74	0.73
Recreational beverage	3	7	3	3	19	27	8	19	0.89	0.77	0.71	0.89
Salad ingredient	0	0	2	1	0	0	6	3	0.00	0.00	0.80	1.00
Sarma ingredient	1	0	0	0	23	0	0	0	1.00	0.00	0.00	0.00
Seasoning	1	2	1	1	3	8	3	5	1.00	0.86	1.00	1.00
Snacks	6	4	2	1	21	19	9	2	0.75	0.83	0.88	1.00
TOTALS	20	22	25	16	115	110	70	56	0.83	0.81	0.65	0.73
<i>Medicine</i>												
Anti-cancer	0	0	2	0	0	0	3	0	0.00	0.00	0.50	0.00
Cardiovascular	4	4	4	5	18	26	19	17	0.82	0.88	0.83	0.75
Dermatological	4	7	4	3	13	30	14	13	0.75	0.79	0.77	0.83
Endocrine	4	7	4	4	23	40	8	12	0.86	0.85	0.57	0.73
Gastrointestinal	7	9	16	12	24	80	48	34	0.74	0.90	0.68	0.67
General Health	5	4	4	3	18	27	12	9	0.76	0.88	0.73	0.75
Nervous system	1	4	4	3	5	21	6	10	1.00	0.85	0.40	0.78
Ophthalmological	1	1	0	1	2	2	0	2	1.00	1.00	0.00	1.00
Oral Health	1	2	3	0	3	7	10	0	1.00	0.83	0.78	0.00
Otolaryngological	1	2	1	2	6	8	1	8	1.00	0.86	1.00	0.86
Respiratory	3	10	10	5	18	56	49	17	0.88	0.84	0.81	0.75
Rheumatism	1	4	3	1	2	10	7	3	1.00	0.67	0.67	1.00
Tuberculosis	0	0	1	0	0	0	5	0	0.00	0.00	1.00	0.00
Urological	1	2	6	3	3	8	24	7	1.00	0.86	0.78	0.67
Veterinary Health	0	1	1	1	0	2	2	1	0.00	1.00	1.00	1.00
Womens Health	0	1	1	0	0	3	2	0	0.00	1.00	1.00	0.00
TOTALS	33	58	64	43	135	320	210	133	0.76	0.82	0.70	0.68
<i>Other</i>												
Cosmetic	0	0	3	1	0	0	9	6	0.00	0.00	0.75	1.00
Household	0	0	1	0	0	0	2	0	0.00	0.00	1.00	0.00
Pesticides	0	0	1	0	0	0	2	0	0.00	0.00	1.00	0.00
TOTALS	0	0	5	1	0	0	13	6	0.00	0.00	0.67	1.00
GRAND TOTAL	53	80	94	60	250	430	293	195	0.79	0.82	0.68	0.70

Qualitative assessment

All of the collected field data (cited plants and plant reports, i.e., plant x used in way y) were compared with the entire ethnobotanical literature of Kosovo (Sejdiu 1984; Mustafa et al. 2012a, b, 2015, 2020;

Hajdari et al. 2018), as well as with literature available in neighboring countries: Albania (Pieroni 2008; Pieroni et al. 2005a, b, 2011, 2013, 2014a, b, 2017; Quave and Pieroni 2014, 2015; Pieroni et al. 2017), Montenegro (Menković et al. 2011), Serbia (Jarić et al. 2007, 2015; Savikin et al. 2013; Zlatković et al. 2014,

Janaćković et al. 2019; Zivkovic et al. 2020), Bosnia (Redžić 2006; Šaric-Kundalic et al. 2010a, 2010b, 2011; Savića et al. 2019), Macedonia (Pieroni et al. 2013; Rexhepi et al. 2013), and region (Sōukand et al. 2015; Dogan et al. 2015) in order to assess if the recorded reports in the current studies were “new” for the region or had been already reported and known.

Results

Plant use data

Botanical taxon and family, local name(s) of each reported taxon, the plant part(s) used, details about their preparations, their traditional local use(s), uses values per each species, and citations per each use categories presented in Table 3. Folk medicinal remedies cited by the informants and the wild food plants locally gathered and eaten are presented in Table 3. A total of 72 plant taxa and seven unidentified taxa belonging to 34 families were recorded. Of 72 reported taxa, 29 taxa were reported by urban Albanians, 36 by rural Albanians, 43 by urban Serbs, 28 by rural Serbs, while 13 taxa were used by all groups (Figs. 2 and 3). Detailed information regarding the overlap of taxa cited by urban and rural Albanians, as well as urban and rural and Serbs for medicinal and food use, are presented in Fig. 2. Members of both ethnic groups ubiquitously mentioned most of the cited taxa (indicated in boldface in Table 3).

A total of 239 plant reports were recorded; of them, 129 were reported by Albanians, 151 were reported by Serbs, while 76 were reported by all groups (Fig. 4). Detailed information regarding the overlapped plant reports recorded by urban and rural Albanians, as well as urban and rural and Serbs for medicinal and food provided in Fig. 4. The use-value index was calculated per each species (Table 3). For rural Albanians, the highest use-value index was recorded for the following species: *Urtica dioica*, *Achillea millefolium*, *Origanum vulgare*, *Malus sylvestris* and *Matricaria chamomilla*; for urban Albanians: *Urtica dioica*, *Cornus mas*, *Vitis vinifera*; for rural Serbs: *Urtica dioica*, *Chenopodium album*, *Taraxacum officinale*, *Matricaria chamomilla*; while for urban Serbs: *Hypericum perforatum*, *Plantago major*, *Urtica dioica*, *Taraxacum officinale* (Table 3).

Individual use reports were divided into the generic categories of Food, Medicine, or Other (Tables 2, 3). Within each broad category, the number of specific use reports and taxa is broken down into subcategories of more specific uses and presented by ethnic group (Table 2). The most use-citations for all groups was for the category of medicine (rural Albanians 320; urban Albanians 135; rural Serbs 133 and urban Serbs 210 use-citations, respectively). The highest number of taxa was also reported by all groups for the Medicine category as well. Regarding subcategories, the highest number of use citations and taxa for all groups was Respiratory, Gastrointestinal, Dermatological, Cardiovascular, and Endocrine ailments. Information consensus on taxa for specific categories of use across all groups is provided in Table 2.

The most common wild plants mentioned by the study participants (in bold in the table) were: *Achillea millefolium*, *Aesculus hippocastanum*, *Artemisia absinthium*, *Chenopodium album*, *Cornus mas*, *Crataegus monogyna*, *Hypericum perforatum*, *Malus sylvestris*, *Matricaria chamomilla*, *Mentha longifolia*, *Origanum vulgare*, *Plantago major*, *Prunus spinosa*, *Pyrus pyraster*, *Rosa canina*, *Taraxacum officinale*, *Urtica dioica*, *Vitis vinifera*. Most of the species cited by participants belong to the Rosaceae (13), Lamiaceae (12), and Asteraceae (8) families. Comparison with previous ethnobotanical reports from the Southwest Balkans revealed that *Leptospermum scoparium* was reported for the first time to be used for medicinal purposes. In contrast, applications for the following species are reported for the first time: *Artemisia absinthium* tea used as anti-rheumatic, *Alopecurus arundinaceus* tea as anti-diabetic, *Crataegus monogyna* tincture used to treat swelling (legs), *Calendula officinalis* (37 flowers with 1 kg of sugar and 2 l of water, boil until the composition becomes 1L) used as an anti-asthmatic and tea to treat cancer, *Malus sylvestris* tea to treat hemorrhoids and wood used to construct wine barrel, *Melissa officinalis* topically applied to treat bee stings, *Petroselinum crispum* tea used to treat liver diseases, *Rosa canina* lotion used to treat headache as a massage agent, *Sambucus ebulus* tea used to treat respiratory disorders and constipation, *Sempervivum tectorum* eaten fresh to treat diabetes, *Sorbus domestica* tea used to treat kidney stone and headache, and *Urtica dioica* tea used to simulate breast milk and maceration used as a pesticide.

Table 3 Medicinal and wild food plants uses recorded in the study area

Botanical or fungal taxon and herbarium accession code	Local plant name	UV U _{Alb}	UV R _{Alb}	UV U _{Ser}	UV R _{Ser}	Part(s) used	Preparation	Treated disease(s) or medical/food uses(s)	N _{uc} U _{Alb}	N _{uc} R _{Alb}	N _{uc} U _{Ser}	N _{uc} R _{Ser}
<i>Achillea millefolium</i> L. (Asteraceae) Rh 01/2017	Hajdučka trava ^S , Bar i pezmetim ^A	0.0	1.1	0.5	0.0	Flower	Decoction	Med: Anti-rheumatic Med: Respiratory inflammations Med: Urinary system infection Med: Stomach-ache Med: Against diarrhea	0	0	4	0
<i>Bishtamith</i> ^A	Bari tērskoi ^A						Tincture, mixed with <i>A. absinthium</i>	Med: Against gastritis	0	0	4	0
<i>Aesculus hippocastanum</i> L. (Sapindaceae) Rh 03/2017	Divli kesten ^S , Divle kushtanje ^{RH}	0.2	0.0	0.3	0.0	Fruits	Tincture (200gr in 1L raki)	Med: Vein inflammation Med: Hemorrhoids	6	0	3	0
<i>Agaricus campestris</i> L. (Agaricaceae)	Paçurka ^A	0.0	0.1	0.0	0.0	Fruiting body	Tincture (40 fruits in 2L raki for 40 days)	Med: Respiratory disorders	4	0	0	0
<i>Aloe vera</i> (L.) Burm.f. (Xanthorrhoeaceae) 06/Pz/2013	Lule llövera ^A	0.0	0.1	0.0	0.0	Leaves	Tea Eaten	Food: Savory pie (pie) filling Med: To treat acne (females)	4	0	0	0
<i>Allopecurus arundinaceus</i> Poir. (Poaceae)	Repka ^S	0.0	0.0	0.0	0.1	Leaves	Tea	Med: Diabetes	0	0	2	2
<i>Althaea officinalis</i> L. (Malvaceae) 07/DE/10	Beli slez ^S	0.0	0.0	0.4	0.0	Flowers	Tea	Med: Urinary system infections Med: Respiratory disorders Med: Asthma	0	0	2	0
<i>Arctium lappa</i> L. (Asteraceae) 12/DE/10	Rapuha ^A	0.0	0.1	0.0	0.0	Leaves	Fresh, topically applied	Med: Against rheumatism	0	0	2	0

Table 3 continued

Botanical or fungal taxon and herbarium accession code	Local plant name	UV U _{Alb}	UV R _{Alb}	UV U _{Ser}	UV R _{Ser}	Part(s) used	Preparation	Treated disease(s) or medical/food uses(s)	N _{uc} U _{Alb}	N _{uc} R _{Alb}	N _{uc} U _{Ser}	N _{uc} R _{Ser}	
<i>Arctostaphylos uva-ursi</i> (L.) Spreng. (Ericaceae)	Uvini čaj ^s	0.0	0.0	0.6	0.0	Leaves	Tea	Med: Urinary system infections (female)	0	0	12	0	
02/Pz/2013	<i>Aronia arbutifolia</i> (L.) Pers. (Rosaceae)	Aronia ^S	0.0	0.0	0.6	0.0	Fruit	Eaten fresh	Food: Drinks	0	0	6	0
	<i>Artemisia absinthium</i> L. (Asteraceae)	Pelin ^{S-Rh}	0.0	0.3	0.0	0.0	Areal parts	Tea	Food: Snacks	0	0	6	0
Rh 02/2017	Pelin ^A	Pelim ^A						Med: Hemorrhoids	0	2	0	0	
								Med: Nervous system	2	2	0	0	
								Med: Hypertension	0	6	0	0	
								Med: Rheumatism	0	2	0	0	
								Med: Headache	3	2	0	0	
								Med: Liver disorders	0	0	2	2	
								Med: Increase immunity	0	5	0	0	
								Med: Against gastritis	0	0	1	1	
								Med: To increase appetite	0	0	2	2	
								Med: Prostate disorders	0	0	0	2	
								Cosmetic: Alopecia	0	0	0	2	
Betula pendula Roth. (Betulaceae)	Breza ^S	0.0	0.0	0.0	0.3	Leaves	Tincture						
Rh 04/2017	<i>Brassica oleracea</i> L. (Brassicaceae)	Lakna tě buta ^A	0.0	0.1	0.0	0.0	Fruiting body	Eaten	Med: Fevers	0	2	0	0
18/DE/10	<i>Calendula officinalis</i> L. (Asteraceae)	Neven ^S	0.0	0.0	0.2	0.4	Leaves	Topically applied	Food: Savory pie (pie) filling	0	2	0	0
Rh 08/2017								Med: Improve blood circulation	0	0	0	2	
								Med: Cancer	0	0	1	0	
								Med: Stomach ulcer	0	0	1	1	
								Med: Skin wound	0	0	0	2	
								Med: Skin pains (hands)	0	0	0	1	
								Med: Asthma	0	0	2	0	
								Decoction (37 flowers boiled with 1 kg sugar and 2 l water)	0	0	2	0	

Table 3 continued

Botanical or fungal taxon and herbarium accession code	Local plant name	UV U _{Alb}	UV R _{Alb}	UV U _{Ser}	UV R _{Ser}	Part(s) used	Preparation	Treated disease(s) or medical/food uses(s)	N _{uc} U _{Alb}	N _{uc} R _{Alb}	N _{uc} U _{Ser}	N _{uc} R _{Ser}
<i>Chenopodium album</i> L. (Amaranthaceae) Rh 09/2017	Divla lloboda ^S Lloboda ^{Rh} Liboda ^A Therbcol ^A	0.1	0.2	0.3	1.3	Leaves	Decoction Eaten	Med: Increase immunity Food: Savory pie filling Food: Soups	4	0	0	0
<i>Cichorium intybus</i> L. (Asteraceae)	Vodopija ^S	0.0	0.0	0.0	0.4	Leaves	Tea	Med: Gastritis Med: Urinary system stones Med: Hemorrhoids	4	3	3	15
<i>Cornus mas</i> L. (Cornaceae) Rh 06/2017	Thana ^A Drenina ^{Rh} Ternine ^S	0.3	0.6	0.4	0.6	Fruits	Root Tincture, mixed with alcohol for 40 days. Tea	Med: Improve immunity Food: Jam Food: Beverage Food: Compote Med: Fevers Med: Hypertension Med: Diabetes Food: Jam	0	0	0	2
<i>Corylus avellana</i> L. (Betulaceae) 28/DE/10	Lajhia e egér ^A Leshnica ^{Rh}	0.1	0.1	0.0	0.0	Fruits	Leaves Eaten raw Fresh	Med: Fevers Med: Hypertension Med: Diabetes Food: Jam	10	0	0	0
<i>Crataegus monogyna</i> Jacq. (Rosaceae) Rh 05/2018	Murizzi ^A Gilog ^S Kozina pogača ^S	0.1	0.6	0.7	0.6	Flowers and Leaves	Eaten raw Fruit Tea	Food: Snacks Med: Respiratory disorders Med: Hypertension Med: Insomnia Decoction (30 g in 1 L boiled for 10 min.) Med: Heart disease for people over 40 years Eaten fresh Tincture	2	2	0	0

Table 3 continued

Botanical or fungal taxon and herbarium accession code	Local plant name	UV U _{Alb}	UV R _{Alb}	UV U _{Ser}	UV R _{Ser}	Part(s) used	Preparation	Treated disease(s) or medical/food uses(s)	N _{uc} U _{Alb}	N _{uc} R _{Alb}	N _{uc} U _{Ser}	N _{uc} R _{Ser}	
Rh 07/2017	<i>Cydonia oblonga</i> Mill. (Rosaceae)	Fton ^{iA-}	0.0	0.1	0.0	0.0	Leaves	Tea		0	5	0	0
Rh 10/2017	<i>Equisetum arvense</i> L. (Equisetaceae)	Rastavic ^S	0.0	0.0	0.1	0.1	Aerial parts	Tea	Med: Urinary system infections Med: Used against urinary system	0	0	0	1
Rh 10/2017	<i>Ficus carica</i> L. (Moraceae)	Fiqi ^A	0.0	0.1	0.0	0.0	Latex	Decoction, mixed with <i>Betula</i> sp.	Med: Warts	0	0	1	0
47/GO/09	<i>Fragaria vesca</i> L. (Rosaceae)	Šumska jagoda ^S	0.0	0.0	0.1	0.0	Leaves	Tea	Med: Sclerosis Food: Jam	0	0	1	0
44/DE/10	<i>Gentiana lutea</i> L. (Gentianaceae)	Linceura ^S	0.0	0.0	0.3	0.2	Root	Tincture	Med: Improve blood circulation Med: Abdominal ache	0	0	2	1
82/GO/09	<i>Helianthus tuberosus</i> L. (Asteraceae)	Arashka ^A Katunje ^{Rh}	0.1	0.2	0.0	0.0	Flowers and Fruits	Tincture	Med: Gastritis Food: Snacks	2	0	0	0
82/GO/09	<i>Hordeum vulgare</i> L. (Poaceae)	Elgji Bari i gjatë ^A	0.0	0.1	0.0	0.0	Leaves	Eaten	Food: Savory pie filling	4	6	0	0
Rh 12/2017	<i>Humulus lupulus</i> L. (Cannabaceae)	Hmejl ^S	0.0	0.0	0.1	0.0	Aerial parts	Decoction, mixed with <i>M. piperita</i> and <i>Ocimum basilicum</i>	Med: Insomnia	0	0	2	0
Rh 11/2017	<i>Hypericum perforatum</i> L. (Hypericaceae)	Kantarion ^S Kantarjon ^{Rh}	0.1	0.0	1.3	0.0	Aerial part	Extracted with oil, for 40 days, exposed to the sun	Med: Skin wounds, burns, skin cuts, skin infection	2	0	4	0
							Tea	Med: Gastritis Med: Stomach ache	2	0	4	0	
								Med: Asthma	0	0	3	0	
								Med: Bronchitis	0	0	6	0	
								Med: Hemorrhoids	0	0	5	0	
								Med: Increase appetite	2	0	4	0	
								Decoction, mixed with <i>A.millefolium</i> & <i>Artemisa absinthium</i>	2	0	0	0	

Table 3 continued

Botanical or fungal taxon and herbarium accession code	Local plant name	UV U _{Alb}	UV R _{Alb}	UV U _{Ser}	UV R _{Ser}	Part(s) used	Preparation	Treated disease(s) or medical/food uses(s)	N _{uc} U _{Alb}	N _{uc} R _{Alb}	N _{uc} U _{Ser}	N _{uc} R _{Ser}
<i>Juniperus communis</i> L. (Cupressaceae) Rh 12/2017	Smreka ^S Smreke ^{Rh}	0.0	0.0	0.1	0.0	Fruits	Decoction	Med: Kidney stones	3	0	2	0
<i>Juglans regia</i> L. (Juglandaceae) Rh 13/2017	Arah ^S Arase ^{Rh}	0.1	0.0	0.3	0.0	Leaves	Tea	Med: Anemia Cosmetic: Hair loss Med: Hemorrhoids Med: Improve digestion Med: Anti-cholesterolemic Med: Skin wounds	0	0	2	0
<i>Lavandula angustifolia</i> Mill. (Lamiaceae) Rh 14/2017	Lavanda ^S	0.0	0.0	0.1	0.0	Fruit Flower	Cortex of fruits Tea	Med: Gastritis Food: Used to make honey	0	0	2	0
<i>Lepospermum scoparium</i> J.R Forst. & G.Forst. (Myrtaceae)	Manuka ^S	0.0	0.0	0.2	0.0	Flower	Eaten	Med: Diabetes Food: Raki (alcoholic beverage)	0	0	2	0
<i>Malus sylvestris</i> (L.) Mill (Rosaceae) Rh 15/2017	Divle jaboke ^{S-Rh} Molla tě egra ^A Divlačke ^{Rh} Ufladqkat ^A	0.1	0.9	0.4	0.5	Fruits	Eaten fresh Fermented (for 40 days) Fruits	Med: Diabetes Food: Jam Food: Pickles Med: Hypertension Med: Respiratory disorders Med: Hemorrhoids Topically applied Other: To deposit wine	4	6	1	2
							Leaves	Tea	0	10	3	0
									5	0	2	2
									0	0	0	2
									0	5	0	0
									0	8	0	0
									0	4	0	0
									0	0	2	0

Table 3 continued

Botanical or fungal taxon and herbarium accession code	Local plant name	UV U _{Alb}	UV R _{Alb}	UV U _{Ser}	UV R _{Ser}	Part(s) used	Preparation	Treated disease(s) or medical/food uses(s)	N _{uc} U _{Alb}	N _{uc} R _{Alb}	N _{uc} U _{Ser}	N _{uc} R _{Ser}
<i>Matricaria chamomilla L.</i> (Asteraceae) Rh 16/2017	Kamilica ^{Rh} Mačkino ^S cvěček ^S Lule te qenit ^A Zhute lule ^{Rh}	0.2	0.9	0.6	0.9	Flowers	Tea	Med: Constipation Med: Improve general health Med: Hemorrhoids Med: Abdominal aches Med: Eyes infection Med: Earache Med: Acnes Med: Toothache Med: Flu Med: Stomachache Med: Diarrhoea Med: Insomnia Med: Rheumatism Med: Wounds Med: Nervous system Med: Headache Med: Abdominal ache Med: Constipation Med: Stomach disorders Med: Respiratory system infections Food: Savory pie filling	0	4	0	4
<i>Mentha longifolia</i> (L.) L. (Lamiaceae) Rh 17/2017	Çaj Nana ^A Bosilék ^S Kojnski bosilék ^{Rh}	0.1	0.3	0.2	0.5	Leaves	Tea	Med: Nervous system Med: Headache Med: Constipation Med: Stomach disorders Med: Respiratory system infections Food: Savory pie filling	0	2	0	0
<i>Mentha x piperita</i> L. (Lamiaceae)	Nenzea ^A	0.0	0.1	0.0	0.0	Leaves	Eaten	Med: Respiratory system infections	0	5	0	0
<i>Mentha pulegium</i> L. (Lamiaceae) 46/PZ/2013	Divila menta ^S Lule menta ^A	0.0	0.1	0.1	0.0	Aerial parts	Tea	Med: Mouth inflammations	0	3	2	0
<i>Morus nigra</i> L. (Moraceae) Rh 17/2017	Mani ^{RH} Dudě i zi ^A	0.1	0.1	0.0	0.0	Leaves	Tea	Med: Diabetes Food: Jam	3	0	0	0

Table 3 continued

Botanical or fungal taxon and herbarium accession code	Local plant name	UV U _{A1b}	UV R _{A1b}	UV U _{Ser}	UV R _{Ser}	Part(s) used	Preparation	Treated disease(s) or medical/food uses(s)	N _{uc} U _{A1b}	N _{uc} R _{A1b}	N _{uc} U _{Ser}	N _{uc} R _{Ser}
<i>Origanum vulgare L.</i> (Lamiaceae) Rh 18/2017	Čaj malia ^A Čaj té fushës ^A Polski čaj ^{Rh} Shumski čaj ^S Buzhurac ^{Rh}	0.2	1.0	0.3	0.3	Flowers	Tea	Med: Respiratory disorders Med: Improve general health Food: Recreational tea	0	15	0	0
<i>Papaver rhoeas L.</i> (Papaveraceae) 14/GO/09		0.1	0.0	0.0	0.0	Leaves	Eaten	Food: Savory pie filling	10	10	5	5
<i>Petroselinum crispum</i> (Mill.) Fuss (Apiaceae)70/DE/10 Rh 22/2017	Pershu magdanoz ^S Bokica ^S Bokvice ^{Rh}	0.0	0.0	0.0	0.3	Leaves	Tea	Med: Urinary tract inflammations Med: Liver diseases	0	0	0	2
<i>Plantago major L.</i> (Plantaginaceae)		0.1	0.0	1.2	0.0	Leaves	Squeeze, topical used Tea	Med: Hemorrhoids Med: Skin infections, skin wounds Med: Mouth inflammation Med: Respiratory disorders (coughing)	4	0	0	0
<i>Primula veris L.</i> (Primulaceae) Rh 21/2017	Jagličé ^S	0.0	0.0	0.0	0.1	Aerial parts	Tea	Med: Tuberculosis Food: Salad Food: Recreational tea Med: Bronchitis	0	0	5	0
<i>Primula vulgaris</i> Huds. (Primulaceae) 30/GO/09	Jagorčevina ^S	0.0	0.0	0.1	0.0	Aerial parts	Tea	Med: Stomach ulcer Med: Increase appetite	0	0	1	0
<i>Prunus cerasifera</i> Ehrh. (Rosaceae) 51/GO/09 Rh 19/2017	Gjerenika ^{Rh}	0.1	0.0	0.0	0.0	Fruits	Eaten fresh Eaten	Food: Snacks Food: Jam	3	0	0	0
<i>Prunus spinosa L.</i> (Rosaceae)	Kulumbria ^{A–Rh}	0.1	0.7	0.0	0.0	Fruits	Eaten fresh Tea	Med: Diabetes Med: Headache Med: Hypertension	4	6	0	0

Table 3 continued

Botanical or fungal taxon and herbarium accession code	Local plant name	UV U _{A1b}	UV R _{A1b}	UV U _{Ser}	UV R _{Ser}	Part(s) used	Preparation	Treated disease(s) or medical/food uses(s)	N _{uc} U _{A1b}	N _{uc} R _{A1b}	N _{uc} U _{Ser}	N _{uc} R _{Ser}
<i>Pyrus communis</i> L. (Rosaceae) Rh 23/2017	Divle slive ^{S–Rh}	0.1	0.0	0.3	0.3	Leaves	Mixed with <i>A. absinthium</i> Eaten	Med: Intestinal infection (parasitic) Food: Jam	0	0	0	2
<i>Pyrus pyraster</i> (L.) Burgsd. (Rosaceae) Rh 20/2017	Divle krushke ^{S–Rh}	0.1	0.5	0.3	0.3	Fruit	Fermented Eaten	Food: Alcoholic beverage(raki) Food: alcoholic beverage (raki) Food: Jam	2	0	2	3
<i>Robinia pseudoacacia</i> L. (Fabaceae) Rh 28/2017	Čiče banuze	0.2	0.0	0.0	0.0	Flowers	Eaten fresh	Food: Fresh fruits Food: Snacks	6	4	3	2
<i>Rosa canina</i> L. (Rosaceae) Rh 24/2017	Divla ružica ^{Rh} Shipurak ^S Tröndafili i egér ^A	0.2	0.3	0.6		Flower Leaves	Lotion (massage), Tea	Med: Headache Med: Diabetes Med: Increase immunity Med: Respiratory disorders Food: Drink (rich vitamin C) Food: Jam	0	0	0	5
<i>Rosmarinus officinalis</i> L. (Lamiaceae) Rh 26/2017	Ruzmarin ^S	0.0	0.0	0.4	0.0	Leaves	Eaten	Med: Heart diseases Med: Urinary system Med: Rheumatism	8	0	2	2
<i>Rubus vestitus</i> Weihe (Rosaceae) Rh 25/2017	Kupina ^S Kupine ^{Rh} Manaferra ^A	0.1	0.3	0.2	0.3	Leaves Fruit	Mixed with brandy (7 days to stay) Eaten	Food: Seasoning (for better taste of food) Med: Tonsils inflammations Med: Diabetes Food: Snack Food: Beverage Food: Jam	4	4	0	0
<i>Rubus idaeus</i> L. (Rosaceae) Rh 27/2017	Mjedra ^A	0.0	0.1	0.0	0.0	Leaves	Decoction Boiled with 1 L water (stay 1 h)	Food: Beverage Food: Jam Med: Mouth inflammations	0	2	0	2
									4	6	3	0
									0	5	0	0

Table 3 continued

Botanical or fungal taxon and herbarium accession code	Local plant name	UV U _{Alb}	UV R _{Alb}	UV U _{Ser}	UV R _{Ser}	Part(s) used	Preparation	Treated disease(s) or medical/food uses(s)	N _{uc} U _{Alb}	N _{uc} R _{Alb}	N _{uc} U _{Ser}	N _{uc} R _{Ser}
<i>Rumex patientia</i> L. (Polygonaceae) CAME-26285	Rřeňjě kuqe ^A	0.0	0.1	0.0	0.0	Leaves	Mixed with yogurt	Food: Savory pie filling	0	2	0	0
<i>Rumex acetosa</i> L. (Polygonaceae) 71/GO/09	Kiselica ^S Svekkla ^A	0.0	0.1	0.0	0.1	Leaves	Mixed with cheese	Food: Filling for savory pie	0	4	0	2
<i>Salvia officinalis</i> L. (Lamiaceae) 88/DE/ 10	Žalfia ^S	0.0	0.0	0.5	0.0	Aerial parts	Tea	Med: Mouth inflammations Med: Prevent sweating	0	0	5	0
<i>Sambucus ebulus</i> L. (Viburnaceae) Rh 30/2017	Kingle ^A Bozokvazova ^S	0.0	0.1	0.4	0.2	Leaves	Tea	Med: Constipation Med: Respiratory disorders Food: Beverage	0	5	5	0
<i>Sambucus nigra</i> L. (Viburnaceae) Rh 31/2017	Štogo ^A Lule štagi ^A	0.0	0.2	0.0	0.0	Flowers	Tea	Med: Respiratory disorders Med: Asthma Med: Coughing	0	0	2	0
<i>Sempervivum tectorum</i> L. (Crassulaceae) Rh 29/2017	Lule veshi ^A Čuvár kuce ^S	0.0	0.2	0.2	0.5	Leaves	Squeezed, topically applied	Med: Earache	0	2	0	0
<i>Sorbus domestica</i> L. (Rosaceae) Rh 32/2017	Vojsa ^A	0.0	0.3	0.0	0.0	Leaves	Mixed with 300 g honey	Med: Female gynecological problems(cysts)	0	0	2	0
<i>Stachys officinalis</i> (L.) Trevs. (Lamiaceae) 76/GO/09	Sarush ^A	0.0	0.1	0.0	0.0	Leaves	Eaten fresh 2–3 pieces in the morning	Med: Gastritis	0	0	1	1
							Decoction	Med: Diabetes Med: Urinary system stones Med: Against diarrhea	0	0	2	0
								Med: Used against headache Med: Skin wounds	0	3	0	0
									0	4	0	0
									0	2	0	0

Table 3 continued

Botanical or fungal taxon and herbarium accession code	Local plant name	UV U _{Alb}	UV R _{Alb}	UV U _{Ser}	UV R _{Ser}	Part(s) used	Preparation	Treated disease(s) or medical/food uses(s)	N _{uc} U _{Alb}	N _{uc} R _{Alb}	N _{uc} U _{Ser}	N _{uc} R _{Ser}
<i>Taraxacum campylocles</i> G.E.Haglund (Asteraceae) Rh 33/2017	Maslaček ^S	0.0	0.0	0.7	1.3	Flowers	Tea	Med: Bronchitis Med: Fewer Med: Asthma Med: Cancer Food: honey (fresh flower 600 flowers 1 kg sugar and boiled until the honey consistency)	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	4 0 3 0 3
							Eaten	Food: Salad Med: Warts	0 0	0 0	0 0	3 3
							Root	Med: Diabetes Med: Lung disorders Med: Stomach aches Fodder	0 0 0 0	0 0 0 0	0 0 0 0	2 2 1 1
<i>Teucrium chamaedrys</i> L. (Lamiaceae) 94/DE/10	Podubica ^S Golla baba	0.0	0.0	0.0	0.1	Leaves	Tea with little sugar Veterinary					
<i>Teucrium montanum</i> L. (Lamiaceae)	Trava iva ^S	0.0	0.0	0.1	0.0	Leaves	Mixed with <i>Urtica dioica</i> put together in brandy	Med: improve digestion	0	0	1	0
							Tea	Med: Stomach aches Med: Hemorrhoids	0 0	0 0	1 0	0 0
<i>Teucrium polium</i> L. (Lamiaceae) 78Pz/2013	Shkemje ^A	0.0	0.2	0.0	0.0	Leaves			0 0	0 0	1 0	0 0
<i>Thymus serpyllum</i> L. (Lamiaceae) 67/GO/09	Majčina dušica ^S	0.0	0.0	0.2	0.2	Aerial parts	Tea	Med: Stomach ache Med: Improve digestion	0 0	0 0	0 2	2 0
<i>Tilia cordata</i> Mill. (Malvaceae)/05/GO/ 09	Lipa ^S Lipe ^{Rh}	0.1	0.0	0.2	0.0	Flowers	Tea	Med: Sedative Med: Respiratory disorders Med: Stomachache Med: Improve general health	0 0 0 4	0 0 0 0	1 2 2 0	1 0 0 0

Table 3 continued

Botanical or fungal taxon and herbarium accession code	Local plant name	UV U _{A1b}	UV R _{A1b}	UV U _{Ser}	UV R _{Ser}	Part(s) used	Preparation	Treated disease(s) or medical/food uses(s)	N _{uc} U _{A1b}	N _{uc} R _{A1b}	N _{uc} U _{Ser}	N _{uc} R _{Ser}
<i>Urtica dioica</i> L. (Urticaceae) Rh 34/2017	Kopriva ^S Pokriva ^{Rh} Hithnat ^A	0.3	1.6	0.8	1.7	Leaves	Fresh leaves	Med: Anemia Food: Savory pie filling for corn pie (kralana) and pie (laknur) Food: Soups Veterinary: Bee attractant Other: Varoa (bee diseases)	0 5 3 0 0	0 10 5 1 1	0 3 0 0 0	5 2 0 0 0
							Tea and Eaten	Cosmetic: Hair loss Med: Improve digestion Med: Improve general health Med: Improve hemorrhoids Med: Kidney stones Med: Improve immunity Med: Improve diabetes Med: Improve breast milk Med: Stomachache Med: Rheumatism Med: Gastritis Med: Skin wounds Med: To remove toxins from body	5 6 0 0 0 2 0 0 0 0 2 2 0 0 0	4 0 0 5 5 0 7 0 5 2 2 0 4 3	3 5 0 0 0 0 0 0 0 0 1 3 0 0 0	1 1 0 0 0 0 0 0 0 0 2 3 0 0 0
							Mixed with water, stay 7 days)	Other: Pesticides	0 0	0 0	2 0	0 0
<i>Vaccinium vitis-idaea</i> L. (Ericaceae)	Brushica ^S	0.0	0.0	0.2	0.0	Root	Mixed with white wine	Med: Jaundice Med: Improve general health	0 0	0 0	2 0	2 0
<i>Vaccinium myrtillus</i> L. (Ericaceae) Rh 38/2018	Borovnica ^S Boronica ^{Rh} Čaj ot lubičice ^S	0.1	0.2	0.1	0.1	Leaves Fruit	Tea Eaten Tea Eaten fresh	Food: Beverage Med: Improve general health Med: Diabetes Food: Recreational tea Med: Bronchitis Med: Respiratory disorders Med: Sore throat	0 0 0 4 0 0	0 0 0 3 0 0	1 1 1 3 0 0	0 0 2 0 3 0
<i>Viola odorata</i> L. (Violaceae) Rh 35/2017									0 0	0 0	5 2	0 0

Table 3 continued

Botanical or fungal taxon and herbarium accession code	Local plant name	UV U _{Alb}	UV R _{Alb}	UV U _{Ser}	UV R _{Ser}	Part(s) used	Preparation	Treated disease(s) or medical/food uses(s)	N _{uc} U _{Alb}	N _{uc} R _{Alb}	N _{uc} U _{Ser}	N _{uc} R _{Ser}
<i>Vitis vinifera</i> L. (Vitaceae)	Lishçë ot grojze ^{en}	0.3	0.0	0.0	0.0	Leaves	Fresh or fermented leaves	Food: Sarma ingredient (leaves used to rolled filling, usually based on minced meat, rice and onions)	23	0	0	0
Rh 36/2017												
Unidentified taxa	Shitirak ^S	0.1	0.0	0.1	0.0	Leaves	Fresh leaves	Food: Savory pie filling	5	0	2	0
Unidentified taxa	Ratnik ^S	0.0	0.0	0.0	0.1	Leaves	Eaten fresh	Med: Gastritis	0	0	0	2
Unidentified taxa	Jonxha ^A s	0.0	0.1	0.1	0.0	Leaves	Tea	Med: Rheumatism	0	2	0	0
Unidentified taxa	Fleta DDE ^A	0.0	0.5	0.0	0.0	Leaves	Squeezed, topically applied	Med: Animal fooder	0	0	2	0
								Med: Skin wounds	0	5	0	0
								Med: Acne	0	4	0	0
								Med: Gastritis	0	4	0	0
								Med: Improve general health	0	3	0	0
Unidentified taxa	Bima tatëll ^A	0.0	0.1	0.0	0.0	Leaves	Tea	Med: Infertility	0	2	0	0
Unidentified taxa	Bari si fara ^A fara	0.0	0.1	0.0	0.0	Leaves	Squeezed, topically applied	Cosmetic: Acne	0	2	0	0
Unidentified taxa	Debelica ^A	0.0	0.0	0.0	0.1	All plant	Traditional uses	Others: brides have used it as an ornamental plant on St. George's Day	0	0	0	2

The most common plants cited by the study participants are highlighted in bold text. UV—Used Value Index. U_{Alb}—urban Albanian, R_{Alb}—rural Albanians, U_{Ser}—urban Serbs, R_{Ser}—rural Serbs. Med—medicinal. N_{uc}—Number of use citations

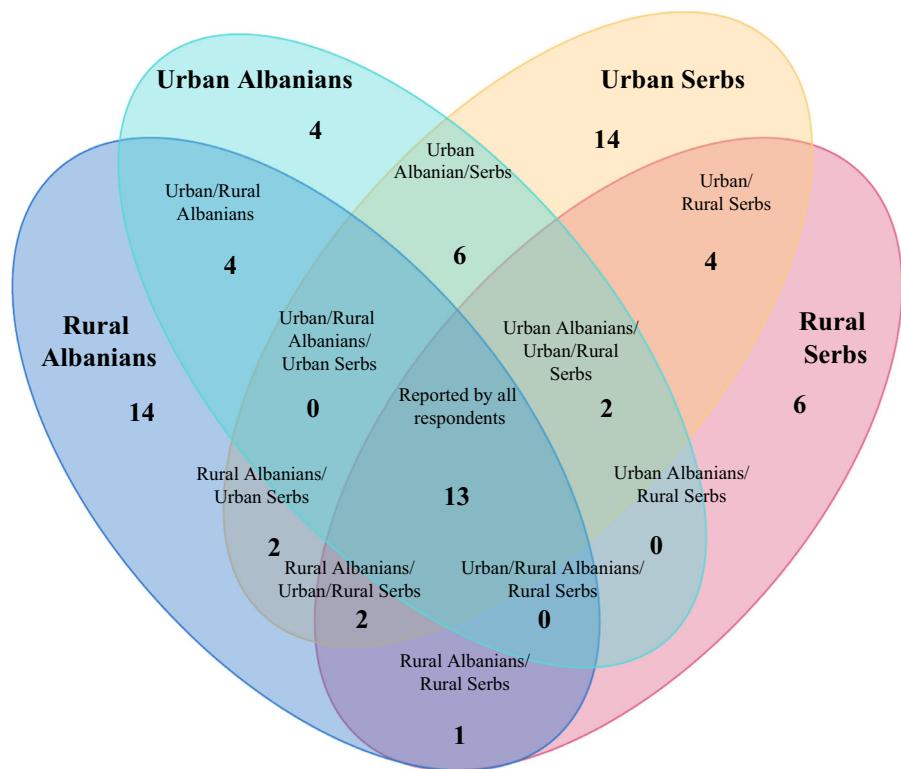


Fig. 2 Venn diagram representing the overlap of taxa cited by urban and rural Albanians, as well as urban and rural and Serbs for medicinal and food use

Discussion

The most common plant species cited by the study participants belong to the Rosaceae (13), Lamiaceae (12), and Asteraceae (8) families. These same three “top” families were found to also be predominant among the wild medicinal taxa used in the folk medicine in other Balkan countries (Menković et al. 2011; pieroni and Giusti 2008; Pieroni et al. 2005a, b; Mustafa et al. 2012a, b, 2015; Hajdari et al. 2018; Jarić et al. 2018; Žuna-Pfeiffer et al. 2019; Savića et al. 2019; Janaćković et al. 2019). Moreover, medicinal species belonging to the three aforementioned botanical families are also among the most quoted in folk medicine worldwide (Moermann et al. 2019) and in other parts of Southern Europe and the Near East, too (Novais et al. 2004; Camejo-Rodrigues et al. 2003; Guarrrera 2006; González-Tejero et al. 2008; Arnold et al. 2015). However, the most quoted single species within these families often differ from one to another region, and we observed in various studies conducted in the Western Balkans that these differences also

depend upon socio-cultural factors (Mustafa et al. 2015; Quave and Pieroni 2015). The most commonly quoted plants in the current study (in bold in Table 3) were also recorded in other areas of Kosovo (Mustafa et al. 2012a, b, 2015; Hajdari et al. 2018). The most frequently cited medicinal uses referred to gastrointestinal troubles (58%), nervous system illness (20%), respiratory system illnesses (19%), urinary and genital system (17%), blood circulation system disorders (16%), endocrine system (15%), skin inflammations (13%), and to increase immunity (10%); these medicinal uses, with slight variations, were also the most frequently cited in other Balkan regions (Mustafa et al. 2012a, b, 2015; Pieroni 2008, 2010; Menković et al. 2011; Hajdari et al. 2018; Savića et al. 2019; Janaćković et al. 2019).

In total, 46 species were used only for medicinal purposes, 13 only for food, while 20 were used as food and medicine. The number of cited species in Anadrini region, in general, was lower compared with other areas mountainous areas, i.e., Sharri Mountains (Mustafa et al. 2015, 2020; Hajdari et al. 2018),

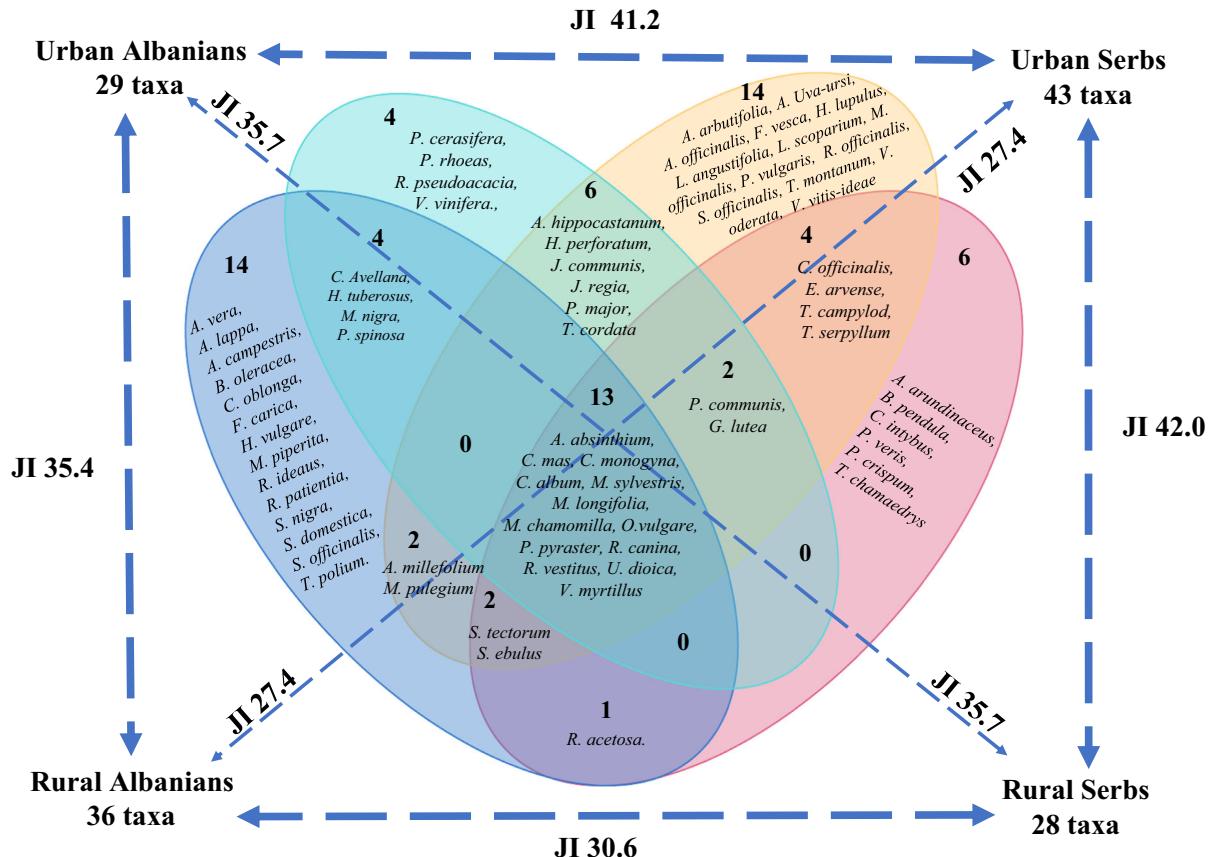


Fig. 3 Venn diagram representing the overlap of taxa and Jaccard Similarity (JI%), cited by urban and rural Albanians, as well as urban and rural Serbs

Albanian Alps (Mustafa et al. 2012a), and Gollak region (Mustafa et al. 2012b). Moreover, in contrast to what happened in the field studies conducted in these mountainous areas of the region, the respondents from Anadrini did not report any plant species used against the Evil Eye; this may be because the current study area is far less remote and as a consequence, TEK and folk-medical belief systems may be more eroded.

Additionally, the study region is less diverse in flora (mainly dominated by arable land), the inhabitants are mainly engaged in large-scale agriculture activities, and the proximity to urban areas may have facilitated easier access to modern medical services.

The most frequently quoted manner of preparation of medicinal plants was represented by teas (56%), decoctions (25%), and tinctures (12%).

To our knowledge, ethnobotanical studies in Europe very rarely assess differences between rural versus urban populations with a given area within the

same study (Ellena et al. 2012; Akbulut 2015), although many field studies have been conducted, separately, in rural territories, more or less remote, and, more sporadically, in urban environments (especially among migrants groups, see for example Pieroni et al. 2005b; van Andel and Westers 2009). In general terms, the worldwide literature on urban ethnobotany has pointed out that in cities or environments with “new” urban inhabitants, the transmission of plant knowledge tends to be more influenced by media and rich social exchanges, often resulting in more hybrid ethnobotany (Vande Broek and Balick 2012; Fontefrancesco and Pieroni 2020).

Comparative assessment of wild plant uses among Albanians and Serbs in the Anadrini Region in our study seems to confirm this trend for the Serb community. The far highest number of plant taxa was reported by urban Serbs, followed by rural Albanians (43 and 36 taxa, respectively, Fig. 3); the

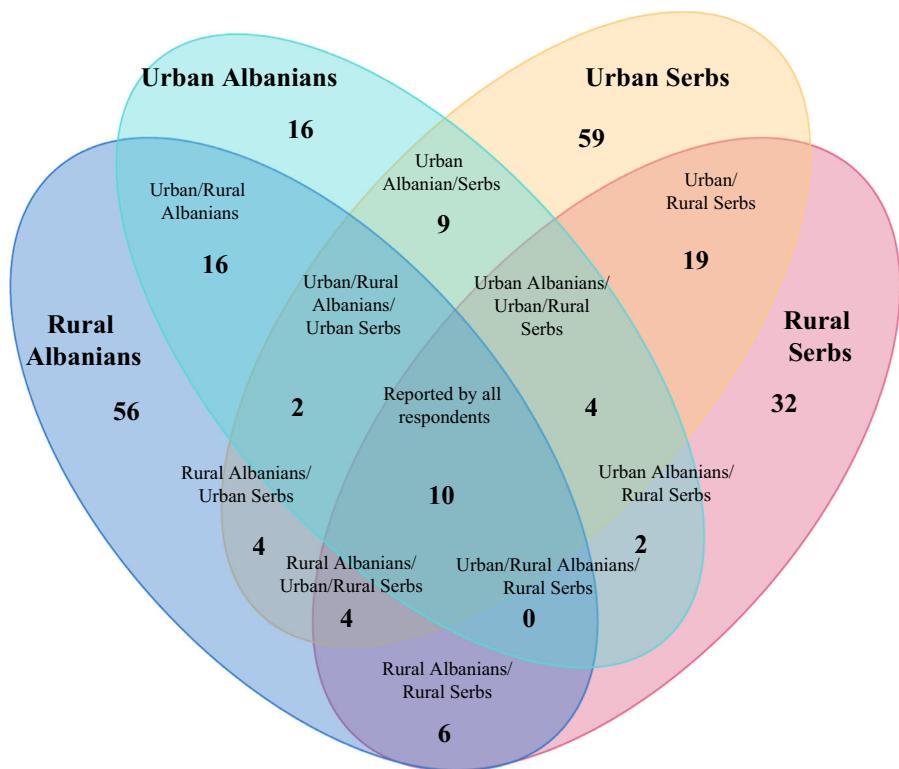


Fig. 4 Venn diagram representing the overlap plant reports recorded by urban and rural Albanians, as well as urban and rural and Serbs for medicinal and food use

highest similarities were shown by the two groups of Serbs and the two urban groups. Rural Serbs share approximately half of the cited taxa with urban Serbs, which may be because these groups share the same religion and have historically had frequent inter-marriages. However, the correspondent situation could not be detected among Albanians since the two Albanian groups showed a more limited number of species used by both groups. This may be due to a somehow expected light divergence of the urban Albanians' dataset from Rahovec. Possibly because of their complex history and Slavic influences—due to a long history of cohabitation with Slavs, which resulted in the unique custom that these Albanians adopted centuries ago a mainly Slavic-based language as their daily *lingua franca*—this group is situated in an intermediate position between the (rural) Albanian and the Serb ethnic groups.

A potential limitation of this cross-cultural comparative analysis may be due to differing sizes of the four considered samples (i.e., number of interviewees). However, the field study revealed that

“saturation” of ethnobotanical information was reached after approximately 20–25 interviews, and this limitation should not have played a crucial role in shaping the differences shown in Fig. 3. Eventually, the similarities of the two urban groups also confirm that urban spaces represent important arenas for exchanging local plant knowledge and also for acquiring new knowledge as well, originated from “external” contexts via popular media or, most possibly nowadays, via social media too (this may be the case for manuka).

Conclusion

The study showed that this area located in south-west Kosovo still represents an important reservoir of TEK. Comparisons among Serbs and Albanian show a similar number of plant taxa used. In contrast, the comparison among rural and urban populations showed that urbanization only decreased the TEK retained by Albanians living in Rahovec—who, in

response to very complex historical trajectories—still speak a Slavic language and possibly adopted very “hybridized” plant-centered customs.

TEK concerning the use of plant natural resources can be useful in proposing new means of plant use; it can also contribute to sustainable local development initiatives of the region (e.g., on eco-tourism and small-scale trade of medicinal herbs, food niche, and handicraft products) and for fostering collaboration and reconciliation among diverse ethnic and religious communities. Cross-cultural ethnobiological studies are crucial to fostering a better understanding of the cultural factors that may affect plant perceptions and uses. These similarities in using plant species show that different groups living together share the same natural resource experiences. At the same time, differences confirm the importance of cultural and historical factors in shaping divergent traditional uses of natural resources. Further studies will need to address ethnobotanical variations among bordering communities and ethnic and religious divides in Europe and beyond.

Compliance with ethical standards

Conflict of interest We confirm that there are no known conflicts of interest associated with this publication. The manuscript has been read and approved by all named authors, and that there are no other persons who satisfied the criteria for authorship but are not listed.

Ethical statement The research was conducted in accordance with the Code of Ethics of the International Society of Ethnobiology (ISE 2006) and in compliance with the ethical standards section of the journal.

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