



Research paper

Traditional uses of wild food plants, medicinal plants, and domestic remedies in Albanian, Aromanian and Macedonian villages in South-Eastern Albania

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ABSTRACT

Ethnobiological research in SE Europe is especially important for providing concrete insights aimed at developing small-scale markets of local medicinal plants and food products.

An ethnobotanical field study was carried out during late summer 2016 among Muslim Albanians, Christian Orthodox Aromanians and Christian Orthodox Macedonians living in six isolated villages of Eastern and SE Albania, as well as in one nearby village located in SW Macedonia. The field survey was conducted via semi-structured interviews by asking 32 local, mainly elderly informants, who retain traditional ethnobotanical knowledge (TEK) regarding traditional utilizations of wild food plants, medicinal plants (both wild and cultivated), mushrooms, plants used as a dye, and other home-made remedies pertaining to both human and animal health. Fifty-two botanical and fungal folk taxa and twenty-four other domestic remedies were recorded; approx. one-fifth of the total reports have not been previously recorded in Albania and the SW Balkans. Among these findings, the uncommon medicinal uses of *Clematis*, *Verbascum*, and *Fraxinus* spp. deserve phytopharmacological investigations.

The most cited taxa were commonly used by all investigated communities, suggesting that the bulk of the Eastern and SE Albanian ethnobotanical knowledge is retained by all locals, beyond linguistic and religious affiliations.

1. Introduction

In the last decade a remarkable number of field studies have explored the ethnobotany of the South-Western Balkans (countries of the Balkan peninsula which do not yet fully belong to the European Union), with the aim of recording folk knowledge and perceptions of wild plants, mainly used in the food and medicinal domains (Jarić et al., 2007, 2015; Pieroni, 2008, 2010; Menković et al., 2011; Pieroni et al., 2011, 2013, 2014a,b, 2015, 2017; Mustafa et al., 2012a,b, 2015; Savikin et al., 2013; Pieroni and Quave, 2014a and references therein; Zlatković et al., 2014; Quave and Pieroni, 2014, 2015).

The rationale for these studies has normally stemmed from the assumption that this area in SE Europe may still possess a tremendous reservoir of Traditional Environmental Knowledge (TEK) related to wild plants. This notion was postulated upon three main facts: 1) the complex bio-cultural diversity of this region, which is a hotspot of biodiversity and hosts many different ethnic and religious groups; 2) the socio-economic environment related to the troubled vicissitudes of the last few decades, which has slowed down the economic development of the former Yugoslavia, while Albania has had to undergo a

complex transition from a strict Communist regime to a market economy, thus allowing more than in many other European countries the permanence of subsistence economies in many isolated rural and mountainous areas; and finally 3) the long “tradition” that the collection of wild plants has had in this region for several centuries, well before the end of the disintegration/occupation of the Ottoman Empire, which started at the beginning of the 19th Century (Kathe et al., 2003).

Small-scale agro-pastoral activities, therefore, still represent the pillar of subsistence economies for those local communities who live in mountainous and rural areas in the Western Balkans, and TEK-centered studies are not only important for understanding local perceptions and uses of plants, but also for providing baseline data that could be employed in projects intended to foster rural development programmes focusing on sustainable valorization of local herbal and plant food resources.

Albania in particular, given its peculiar vicissitudes during the past century and especially the fact that the country remained completely isolated from the rest of the world for nearly half of the 20th century, represents a remarkable *bio-cultural refugium*. Eastern Albania, even more particularly, served as a crucial “sanctuary” of medicinal and

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aromatic plants for many decades during the Communist regime (1945–1991) and it still represents an important reservoir for the harvesting of wild plants mainly destined for Western European herbal markets (Londoño et al., 2008). In addition, such a mountainous area may offer insights into certain new medicinal plants or medicinal plants that are still locally used today, and could enlarge the herbal portfolio of non-governmental organizations (NGO's) and stakeholders interested in cultivating and gathering herbal teas, which are very often simply dictated or “imposed” by Western markets.

Moreover, we are now well aware that bio-conservation initiatives aimed at preserving local medicinal, aromatic, and wild food plants need to be culturally sensitive; in other words, the “emic” perceptions that local populations have towards their natural plant environment must be taken into account in order to successfully implement measures regarding nature protection and this can only be done via in-depth, ethnography-based ethnobotanical studies.

The main goal of the present study was to assess how religious and ethnic affiliations may have played a role in shaping local plant uses of different communities living in the same natural environment in Albania. To this end, we focused on an interesting case-study, represented by an isolated mountainous area of Eastern and SE Albania, where three ethnic/religious communities have historically co-existed for many centuries: Muslim Albanians, Christian (Orthodox) Aromanians, and Christian (Orthodox) Macedonians.

Orthodox Macedonians in Albania live along the Eastern shores of Prespa Lake as well as the Macedonian and Greek borders, and they represent the remains of populations that inhabited Slavic areas which were then left within the borders of the Albanian nation, when it was formed in 1912. Aromanians (who define themselves as Rrămeni/Rrămăni, while Albanians refer to them as Çobanë or Çobenë) are a Latin population of the Orthodox Christian faith that traditionally practiced transhumant pastoralism in SE Europe, but now live scattered throughout the southern Balkans (most notably in Western Macedonia, Southern Albania, and Northern Greece). Aromanian ethnogenesis is still disputed and they may represent the descendants of ancient Latin speakers or “Latinized” autochthonous Balkan populations, including Greeks, Illyrians, and Trakians, or even Romanian populations who moved southwards (Weigand, 1894; Burileanu, 1912; Wace, 1914; Dahmen, 1985, 2005; Winniffrith, 1987; Kahl, 1999; Schwandner-Sievers, 1999; Trifon, 2013). They still speak Aromanian, a threatened language belonging to the Romanian group (Lewis et al., 2016), and all across Albania there remains only four scattered, very isolated, tiny villages which are entirely inhabited by Aromanians (Kahl, 1999). One of these tiny villages (Llengë/Lunca) was the focus of a previous field study we conducted a few years ago in Eastern Albania (Pieroni et al., 2015).

The objectives of this study were: a) to document the ethnobotanical knowledge related to wild plant-based cuisine, medicinal plants, and other natural, domestic remedies pertaining to humans and animals in Albanian, Macedonian, and Aromanian villages of Eastern and SE Albania; b) to compare the collected data between the three linguistic/religious communities; and c) to compare the same data with the findings of previous ethnobotanical surveys conducted in Albania and SW Balkans, in order to discover new plant uses of potential interest for local herbal and niche food-speciality markets.

2. Material and methods

2.1. Study areas

Fig. 1 shows the study area and the seven visited villages: one inhabited by Orthodox Aromanians: Niçë (Aromanian: Nicea; 1,084 m a.s.l.); three inhabited by Orthodox Macedonians: Vërnik (Macedonian: Врбник; 1,055 m a.s.l.), Cerjë (Macedonian: Церје; 1,116 m a.s.l.), and Tuminec (Macedonian: Туминец; 862 m a.s.l.); and three Muslim Albanian villages: Osnat (1,103 m a.s.l.),

Qarrishtë (1,009 m a.s.l.), and – in the contiguous SW Macedonian territory – Nakolets (Macedonian: Наколец; 865 m a.s.l.). Each of the seven villages has a permanent population between 100 and 600 inhabitants.

2.2. Field study

The field study was carried out in late summer 2016; the sampling was conducted by identifying study participants among elderly individuals who retained traditional knowledge concerning plants, i.e. farmers and shepherds. The sampling of these specific groups was undertaken as previous field work conducted in Albania found – even in very remote areas – TEK systems that are rapidly disappearing due to remarkable social changes, i.e. these systems of knowledge and practices are rapidly vanishing among the middle and youngest generations (Pieroni, 2010; Pieroni and Sökand, 2017).

In-depth open and semi-structured interviews were then conducted with 32 selected villagers (9 Aromanians, 13 Macedonians and 10 Albanians). The participants, including 14 men and 18 women, were between the ages of 48 and 84 years (mean age: 64.5; standard deviation: 10.1), with the large majority of the informants from all communities above 60 years of age. Study participants were asked about local uses of: (a) wild food plants; (b) medicinal plants (wild, semi-domesticated, and cultivated) in both human and veterinary medicine; (c) semi-domesticated and cultivated food plants employed in “unusual” ways (i.e. diverging from what those cultivated plants are normally used for in Europe and Western countries); (d) dyeing plants; (e) food or medicinal mushrooms, if any; and (f) other domestic remedies pertaining to the food and medicinal domains.

Specifically, local name(s) of each reported taxon, the plant part(s) used, details about their preparations and food, medicinal or other domestic uses were recorded.

Study participants were asked to report current uses considered “traditional”, i.e. considered part of the perceived cultural heritage, as well as uses they could recall from their childhood, which may no longer be exploited. Interviews were conducted in the Albanian language with the help of an interpreter, as all participants (including the Aromanians and Macedonians) were bilingual and fluent in Albanian.

Informed consent from all participants was verbally obtained prior to conducting interviews and ethical guidelines prescribed by the International Society of Ethnobiology (ISE, 2008) were followed. During the interviews, informants were always asked to show the reported plants (fresh or dried).

Voucher specimens were collected during previous fieldwork conducted in the neighboring Gollobordo area of Eastern Albania (Pieroni et al., 2014a), and taxonomic identification followed the official *Flora of Albania* (Paparisto et al., 1988; Qosia et al., 1992, 1996; Vangjeli et al., 2000). Botanical nomenclature and family assignments followed The Plant List database (2013) and the Angiosperm Phylogeny Group III (Stevens, 2012), respectively. Local plant names were transcribed following the rules of standard Albanian and Romanian languages, while Macedonian folk names were transcribed using the Latin alphabet.

2.3. Data analysis

A Quotation Index was calculated for each report as the percentage of those informants who mentioned that specific report.

Moreover, all the collected field data (plant reports, i.e. plant x used in way y) were compared with the entire ethnobotanical literature of Albania (Pieroni et al., 2005, 2011, 2014a,b, 2015a, 2017; Pieroni, 2008, 2010; Quave and Pieroni, 2014, 2015; Pieroni and Sökand, 2017) and the surrounding countries located in the southern portion of the Western Balkans, including Montenegro (Menković et al., 2011), Kosovo (Sejdju, 1984; Mustafa et al., 2012a,b, 2015), South Serbia

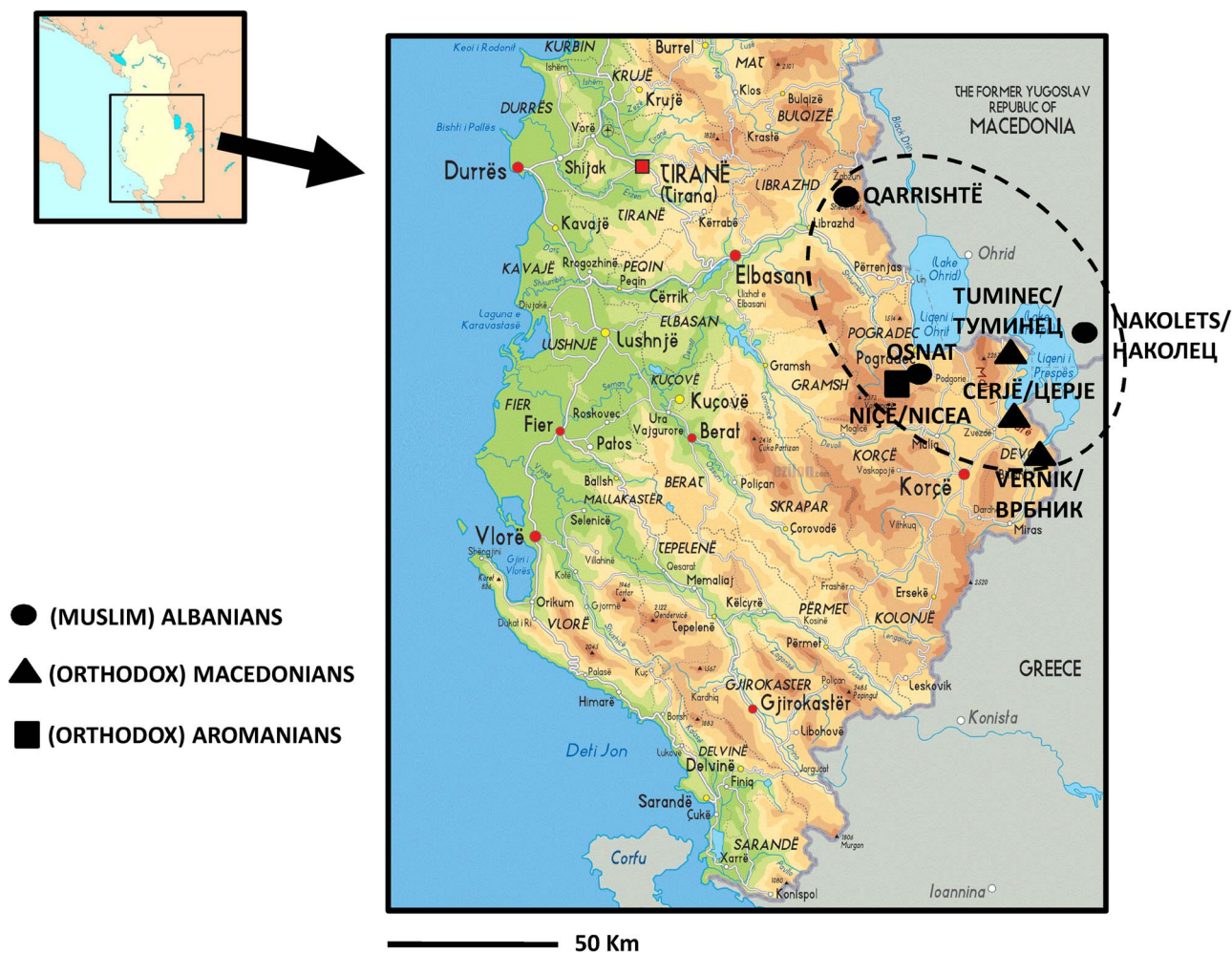


Fig. 1. Map of study site and visited villages.

(Jarić et al., 2007, 2015; Savikin et al., 2013; Zlatković et al., 2014), Macedonia (Pieroni et al., 2013; Rexhepi et al., 2013), and Western Greece (Vokou et al., 1993), in order to assess if the recorded reports in the current study were “new” for the region or had already been reported and known.

3. Results

3.1. Medicinal and wild food plant uses

Table 1 represents the plant-based domestic, folk medicinal remedies mentioned by the informants, as well as the wild food plants locally gathered and consumed.

For each cited folk species, the botanical taxon and family, voucher code, used plant parts, local folk name, traditional local use(s), and the frequency of citation for each stated use were reported.

Fifty-two plant and fungal folk taxa (51 identified; 1 unidentified) and approx. one hundred folk use reports were recorded.

The most common wild plant parts mentioned by the study participants (in bold in the table) included *Cornus mas* fruits, *Urtica dioica* and *Rumex patientia* leaves, *Origanum* and *Sideritis* spp. aerial parts, and *Prunus cerasifera* fruits.

With the exception of *Sideritis* spp., all these wild plants also represent the most commonly collected and locally used species in North and NE Albania (Pieroni and Quave, 2014b).

Comparing the data with the Albanian and other SW Balkan ethnobotanical literature, the following three use reports emerged as novel or little-known:

- *Clematis vitalba* and *Verbascum* spp. fresh flowers/inflorescences, which are externally applied to various skin inflammations.

While fresh *Clematis vitalba* aerial parts have long been considered toxic and the plant is well known to be a revulsive and a skin irritant because of its protoanemonine content (Roth et al., 1994), its extracts have shown anti-inflammatory, anti-nociceptive, antipyretic, antimicrobial, and anti-obesity effects (Buzzini and Pieroni, 2003; Yesilada and Küpeli, 2007; Marrelli et al., 2013). The external use of *Verbascum* spp. for treating wounds has also been observed in Turkish folk medicine and its potent activity well confirmed in *in-vivo* studies, but only for a few species of the genus (Süntar et al., 2010).

- *Fraxinus excelsior* bark tea as a diuretic; this possible, but not yet sufficiently proven, activity has been addressed by very few studies (Eddouks et al., 2005; Wright et al., 2007, and references therein).

One-fifth of the total recorded plant remedies were previously unknown, to our knowledge, in Albanian ethnobotany.

Sideritis seems to represent, certainly in part because of its ecological availability in Albania which is remarkable in Central-Southern Albania, a clear marker of “Southernness” (meaning “Toskness” in Albania). While *Origanum vulgare* tea is extremely popular in (Gheg) North and NE Albania, *Sideritis raeseri* and *S. scardica* teas are equally popular in SE Albania, whereas some of our informants, however, tended to consider what they call “red tea” (*Origanum vulgare*) more effective than “green tea” (*Sideritis* spp.).

Table 1

Traditional uses of medicinal, dyeing and wild food plants recorded in the study area; a few semi-domesticated and cultivated food species, which have been cited for *unusual* utilizations, are also included. (In bold type are those *wild* taxa, as well as their reports, which were mentioned by more than 50% of the informants).

Botanical taxon, family, used parts, and voucher specimen code	Recorded local names	Local traditional use	Same report already recorded in Albania and SW Balkans	Quotation Index
<i>Achillea millefolium</i> L., Asteraceae Flowering aerial parts (dried) CAME 26294	<i>Lule të bardha</i> ^{ALB}	Tea: externally applied to eye inflammations	No	0.06
<i>Agaricus campestris</i> L., Agaricaceae Upper fruiting body	<i>Puçerçt</i> ^{MAK}	Cooked	No	0.06
<i>Allium cepa</i> L., Amaryllidaceae Bulb	<i>Kromit</i> ^{MAK}	Externally applied with salt for treating bruises	Yes	0.63
	<i>Qepë</i> ^{ALB} <i>Zepi</i> ^{ARO}	External bulb parts are decocted and the decoction is used as a dye (color: yellow)	Yes	0.06
<i>Allium porrum</i> L., Amaryllidaceae Leaf juice	<i>Pras</i> ^{ALB} <i>Pres</i> ^{ARO} <i>Presh</i> ^{ALB}	Instilled in the ear for treating ear inflammations	Yes	0.22
	<i>Hudhër</i> ^{ALB}			
<i>Allium sativum</i> L., Amaryllidaceae Bulb	<i>Hudhër</i> ^{ALB}	Consumed, mixed with honey (<i>mjal</i> ^{ALB}) for treating flu	Yes	0.06
<i>Amaranthus retroflexus</i> L., Amaranthaceae Leaves (fresh)	<i>Şte</i> ^{ARO}	Filling for salty pies	Yes	0.13
<i>Artemisia absinthium</i> L., Asteraceae Aerial parts (dried)	<i>Pelini</i> ^{ALB}	Tea: intestinal discomforts	Yes	0.06
<i>Arum italicum</i> Mill., Araceae Aerial parts (fresh)	<i>Bar gjarpëri</i> ^{ALB}	Externally applied to snake bites	No	0.06
<i>Aspenium trichomanes</i> L. and possibly <i>Ceterach officinarum</i> Willd., Aspleniaceae Whole plant (dried) CAME26293 (<i>A. trichomanes</i>)	<i>Fir i egër</i> ^{ALB} <i>Fir guri</i> ^{ALB} <i>Firka</i> ^{ARO}	Tea: diuretic	Yes	0.19
	<i>Peperutka</i> ^{MAK} <i>Xexefende</i> ^{ALB}	Externally applied for treating wounds	Yes	0.06
<i>Clematis vitalba</i> L., Ranunculaceae Flowers (fresh)	<i>Kurbnda</i> ^{ALB}	Chopped and externally applied to skin infections	No	0.06
<i>Cornus mas</i> L., Cornaceae Fruits CAME26279	<i>Cor</i> ^{ARO} <i>Drenka</i> ^{MAK} <i>Thanë</i> ^{ALB}	Consumed raw as a snack and considered a blood depurative	Yes	0.56
		Compote	Yes	0.94
		Macerated in water, the resulting fermented liquid (<i>narden</i> ^{ALB}) is drunk to alleviate constipation	Yes	0.63
		Fermented and distilled into <i>raki</i> , which is drunk for treating diarrhea and as a cardiotonic	No	0.56
<i>Corylus avellana</i> L., Betulaceae Kernels CAME26242	<i>Lešnik</i> ^{MAK} <i>Ljathi</i> ^{ALB}	Eaten raw as a snack	Yes	0.09
	<i>Morrist</i> ^{ALB}	Consumed raw as a snack (in the past)	Yes	0.06
<i>Crataegus monogyna</i> Jacq. and possible other <i>Crataegus</i> spp., Rosaceae Fruits (fresh) CAME26280				
<i>Cucurbita maxima</i> Duchesne, Cucurbitaceae Fruits (fresh)	<i>Kungull</i> ^{ALB}	Consumed cooked (esp. as filling for home-made <i>börek</i>), also for treating constipation	No	0.09
<i>Cydonia oblonga</i> Mill., Rosaceae Leaves (fresh) and fruits CAME29290	<i>Duna</i> ^{MAK} <i>Ptol</i> ^{ALB} <i>Gutur</i> ^{ARO}	Compote (fruits)	Yes	0.63
		Fruits decoction is drunk as a recreational or appetizing beverage	No	0.06
		Leaves are decocted, and the resulting decoction used for dyeing wool (color: beige)	No	0.06
<i>Fragaria vesca</i> L., Rosaceae Fruits (fresh) CAME26247	<i>Lulestrydhe</i> ^{ALB}	Consumed raw as a snack	Yes	0.06
<i>Fraxinus excelsior</i> L., Oleaceae Bark CAME26304	<i>Flamber</i> ^{ARO}	Decoction: diuretic	No	0.09
		Decocted, and the resulting decoction used for dyeing wool (color: black);	No	0.09
<i>Gentiana lutea</i> L., Gentianaceae (?) Leaves	<i>Sen</i> ^{MAK}	Tea: constipation	Yes	0.06
<i>Hordeum vulgare</i> L., Poaceae Fruits	<i>Elb</i> ^{ALB} <i>Eçame</i> ^{MAK} <i>Joçmeri</i> ^{MAK} <i>Basam</i> ^{MAK}	(In the past) ground into flour and used for baking bread (often mixed with corn and rye flours)	Yes	0.41
	<i>Balsam</i> (<i>çaj</i>) ^{ALB} <i>Lule e kuqe</i> ^{ALB}	Tea: stomach-ache	Yes	0.09
	<i>Lars</i> ^{ALB}	Externally applied for treating wounds	Yes	0.06
<i>Hypericum perforatum</i> L., Hypericaceae Flowering aerial parts (dried) CAME26270				
<i>Ilex aquifolium</i> L., Aquifoliaceae Leaves (dried)		Tea: diuretic	Yes	0.09
<i>Juglans regia</i> L., Juglandaceae Unripe fruits (fresh) and kernels (fresh and dried) CAME26238	<i>Arra</i> ^{ALB} <i>Kestik</i> ^{MAK} <i>Nuc</i> ^{ARO}	Fruits are decocted, and the resulting decoction used for dyeing hair and wool (color: brown)	Yes	0.09
		Kernels are eaten raw or dried, or put in cakes during festivities	Yes	0.56
<i>Juniperus communis</i> L., Cupressaceae Cones (fresh and dried)	<i>Dëllinjë</i> ^{ALB} <i>Ginepr</i> ^{ARO}	Fermented and distilled to obtain <i>raki</i>	Yes	0.31

(continued on next page)

Table 1 (continued)

Botanical taxon, family, used parts, and voucher specimen code	Recorded local names	Local traditional use	Same report already recorded in Albania and SW Balkans	Quotation Index
CAME26253				
<i>Malus sylvestris</i> Mill. and possibly a few landraces of <i>M. domestica</i> Borkh., Rosaceae	<i>Mollë e egër</i> ^{ALB}	Dried and later decocted to obtain a “recreational” beverage (<i>osha</i> ^{ALB})	Yes	0.31
Fruits (fresh)		Fermented in water to produce home-made vinegar, drunk to combat hypertension and obesity	Yes	0.31
CAME26236		Vinegar is also used as a yogurt starter	No	0.09
		Vinegar is given to animals for treating various internal discomforts	Yes	0.09
<i>Matricaria chamomilla</i> L., Asteraceae	<i>Kamilica</i> ^{ALB}			
Flowering tops (dried)	<i>Koromil</i> ^{ARO}	Tea: intestinal discomforts, diarrhea, cough	Yes	0.06
CAME26235				
<i>Nicotiana tabacum</i> L., Solanaceae	<i>Duhan</i> ^{ALBMAK}	Topically applied to cuts as a hemostatic	Yes	0.38
Leaves (dried)				
<i>Origanum vulgare</i> L., Lamiaceae	<i>Ceai muntë</i> ^{ARO}			
Flowering aerial parts (dried)	<i>Çaj</i> ^{ALB}	Tea: recreational, sore throat, cough, flu	Yes	0.94
CAME26233	<i>Çaj i egër</i> ^{ALB}			
	<i>Çaj malë</i> ^{ALB}			
	<i>Çaj të kuqe</i> ^{ALB}			
	<i>Rigon</i> ^{ALB}			
<i>Petroselinum crispum</i> (Mill.) Fuss, Apiaceae	<i>Majdanoz</i> ^{ALB}	Tea: intestinal discomforts	No	0.06
Aerial parts (fresh)				
<i>Prunus avium</i> (L.) L. and <i>P. cerasus</i> L., Rosaceae	<i>Qershë</i> ^{ALB}	Consumed as a snack	Yes	0.06
Fruits (fresh)				
CAME26240 (<i>P. avium</i>)				
CAME26298 (<i>P. cerasus</i>)				
<i>Prunus cerasifera</i> Ehrh., Rosaceae	<i>Divj slivi</i> ^{MAK}	Fermented and	Yes	0.78
Fruits (fresh)	<i>Kumbull</i>	distilled to obtain <i>raki</i> (<i>racja</i> ^{MAK} , <i>ricia</i> ^{ARO})		
CAME26266	<i>e egër</i> ^{ALB}	This home-made <i>raki</i> is instilled in the ear for treating ear-aches or given to animals having digestive troubles	No	0.38
	<i>Pruna de locu</i> ^{ARO}			
	<i>Pruna agra</i> ^{ARO}			
<i>Prunus domestica</i> L. Rosaceae	<i>Kumbull</i> ^{ALB}	Consumed for treating constipation	Yes	0.09
Fruits (fresh and dried)	<i>Sliva</i> ^{MAK}	Fermented (mixed with cherry plums) and distilled in <i>raki</i>	Yes	0.31
<i>Prunus spinosa</i> L., Rosaceae	<i>Kolumbrita</i> ^{MAK}	Consumed raw as a snack	Yes	0.06
Fruits (harvested after the frost; dried)	<i>Kollumbria</i> ^{ALB}	Tea (dried fruits): urinary infections	No	0.09
CAME26260				
<i>Rosa canina</i> L., Rosaceae	<i>Šipina</i> ^{MAK}	Tea: sore throats, cough, flu, diarrhea	Yes	0.12
Pseudofruits (dried)	<i>Šipunka</i> ^{MAK}			
CAME26237	<i>Šupina</i> ^{MAK}			
<i>Rosa</i> spp., Rosaceae	<i>Trëndafil</i> ^{ALB}	Externally applied for treating acne	No	0.09
Stem juice				
<i>Rubus ideaus</i> L., Rosaceae	<i>Mjedër</i> ^{ALB}	Consumed raw as a snack	Yes	0.06
Fruits (fresh)				
<i>Rubus ulmifolius</i> Schott, Rosaceae	<i>Manaferrë</i> ^{ALB}	Consumed raw as a snack	Yes	0.06
Fruits (fresh)				
CAME26310				
<i>Rumex acetosa</i> L. and possibly other <i>Rumex</i> spp., Polygonaceae	<i>Kiselec</i> ^{MAK}	Filling for börek (<i>byrek</i> ^{ALB} , <i>kori</i> ^{MAK} , <i>peta</i> ^{ALB})	Yes	0.22
Leaves (fresh)	<i>Mameleçka</i> ^{ALB}			
CAME26243	<i>Uthle</i> ^{ALB}			
	<i>Uthullë</i> ^{ALB}			
<i>Rumex patientia</i> L., Polygonaceae	<i>Agre</i> ^{ARO}	Filling for börek (<i>byrek</i> ^{ALB} , <i>kori</i> ^{MAK} , <i>peta</i> ^{ALB}); <i>sarma</i> (<i>vişkë</i> ^{MAK})	Yes	0.78
Leaves (fresh)	<i>Lempjeta</i> ^{ALB}			
CAME26285	<i>Lepjetë</i> ^{ALB}			
	<i>Štavie</i> ^{MAK}			
	<i>Zelje</i> ^{MAK}			
<i>Salix</i> spp., Salicaceae	<i>Salzene</i> ^{ARO}	Decocted, and the resulting decoction used for dyeing wool (color: blue)	No	0.09
Bark				
<i>Secale cereale</i> L., Poaceae	<i>Ers</i> ^{MAK}	Ground into flour and the flour used in baking, especially in the past (often mixed with corn flour);	Yes	0.56
Fruits	<i>Secara</i> ^{ARO}	roasted, ground, and decocted, to obtain a kind of coffee substitute (in the past)		0.09
	<i>Thekrë</i> ^{ALB}			
<i>Sempervivum tectorum</i> L., Crassulaceae	<i>Bar veshi</i> ^{ALB}	Instilled in the ear for treating ear-aches and ear inflammations	Yes	0.38
Leaf juice	<i>Rezir</i> ^{ARO}			
1 <i>Sideritis raeseri</i> Boiss. & Heldr. and possibly <i>S. scardica</i> Griseb., Lamiaceae	<i>Ceai de locu</i> ^{ARO}	Tea: recreational/panacea, sore throats, cough, flu	Yes	0.78
Flowering aerial parts (dried)	<i>Çaj</i> ^{ALB}			
CAME26281 (<i>S. raeseri</i>)	<i>Çaj të verdhë</i> ^{ALB}			
	<i>Çaj vendhit</i> ^{ALB}			
	<i>Çaj veškë</i> ^{MAK}			
<i>Solanum tuberosum</i> L., Solanaceae	<i>Kartuli</i> ^{MAK}	Boiled and ingested for treating diarrhea	Yes	0.09
Tubers (fresh)				
<i>Taraxacum officinale</i> Weber, Asteraceae	<i>Meleçka</i> ^{MAK}	Filling for börek (<i>kori</i> ^{MAK})	Yes	0.06
Leaves (fresh)				
CAME26289				

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Table 1 (continued)

Botanical taxon, family, used parts, and voucher specimen code	Recorded local names	Local traditional use	Same report already recorded in Albania and SW Balkans	Quotation Index
<i>Urtica dioica</i> L., Urticaceae Leaves (fresh) CAME26262	<i>Kopriva</i> ^{MAK}	Filling for <i>börek</i> (<i>byrek</i> ^{ALB} , <i>kor</i> ^{MAK} , <i>pet</i> ^{ALB} , <i>pita</i> ^{ARO}) or cooked and consumed with dairy products	Yes	0.78
	<i>Hithër</i> ^{ALB} <i>Urzë</i> ^{ARO} <i>Urzë</i> ^{ARO}	Externally applied with salt for treating bruises	No	0.09
<i>Vaccinium myrtillus</i> L., Ericaceae Fruits (fresh and dried)	<i>Boronicë</i> ^{ALB}	Consumed raw as a snack	Yes	0.12
	<i>Hap</i> ^{ARO}	Tea: anti-diarrheal	Yes	0.31
<i>Verbascum longifolium</i> Ten. and possibly other <i>Verbascum</i> spp., Schrophulariaceae Inflorescences (fresh) CAME26287	<i>Lilumë</i> ^{ALB}	Chopped and externally applied to wounds	No	0.09
<i>Vitis vinifera</i> L., Vitaceae Fruits (fresh); marc; young shoot juice; young leaves	<i>Grozje</i> ^{MAK}	Consumed fresh for treating constipation	Yes	0.09
	<i>Rrush</i> ^{ALB}	Fermented into wine and distilled in <i>raki</i> , drunk hot for treating flu or intestinal discomforts	Yes	0.78
		Fermented into vinegar (<i>uthull</i> ^{ALB} , <i>kiselina</i> ^{MAK}), which is externally rubbed on chest for treating cold or given to animals for treating digestive troubles	No	0.31
		Vinegar is also used as a yogurt starter	No	0.09
		Shoot juice is instilled in the ear for treating ear-aches	Yes	0.09
		Liquid portion of marc (leftover from <i>raki</i> distillation, <i>utočka</i>) is heated and drunk for treating cough	No	0.06
		Leaves are used for <i>sarma</i> and as filling for <i>börek</i> , often together with other wild vegetables (dock and nettles)	Yes	0.09
<i>Zea mays</i> L., Poaceae Fruits and stigma (dried)	<i>Misë</i> ^{ALB,MAK} <i>Misru</i> ^{ARO}	Grains are ground into flour; the flour is used for baking bread and making <i>börek</i> (often mixing white and yellow corn flours – the mixture is called <i>bajanik</i> ^{ALB})	Yes	0.87
		Corn flour, cooked with butter, is consumed for treating intestinal discomforts	No	0.06
		Stigma are used in teas as a diuretic	Yes	0.06
<i>Ziziphus jujuba</i> Mill., Rhamnaceae Fruits (fresh)	<i>Curbusche</i> ^{ARO}	Eaten raw as a snack	No	0.09
Diverse tree species Wood		Burned and the resulting ash (<i>hi</i> ^{ALB}) is used to prepare a tea which is drunk recreationally	No	0.06
Unidentified mushroom taxon Fruiting body	<i>Gambi</i> ^{MAK}	Cooked	–	0.06

(?): identification hypothesized via local folk name and recorded morphological description of the plant.

3.2. Other domestic folk remedies

Table 2 presents the other natural folk remedies mentioned by the informants, as well as those plant remedies externally acquired. As in the previous table, folk names and exact, detailed, locally cited traditional uses are reported.

Those ingredients and uses that were reported by more than half of the study participants are highlighted in bold type (e.g. whey as a diuretic and woman's breast milk for treating eye and ear-inflammations, especially in the past).

Twenty-four ingredients in total were recorded.

In particular, the continued use of oil extract of baby mice for treating ear-ache is noteworthy (Table 2).

4. Discussion

4.1. Albanian vs. Aromanian and Macedonian ethnobotany

Although a thorough comparison between the recorded Albanian, Aromanian and Macedonian ethnobotanical data is not feasible given the small study sample, a general trend can be observed.

The majority of the cited plants (quoted by more than 30% of the informants) were more or less ubiquitously mentioned by members of all three communities (Table 3), with the only exception being dock leaves (*Rumex patientia*) used as filling for preparing home-made *börek*, which is more prevalent among Albanians and less crucial among Aromanians.

In addition, a few minor divergences could be observed for less cited taxa (but still mentioned by more than 3 informants), thus making the

identification of potential culturally-specific plant markers (*sensu* Pieroni et al., 2015b) quite difficult.

The main ethnobotanical divergences recorded among the three communities include:

- medicinal pumpkin-based food preparations (*Cucurbita maxima*), recreational decoctions of dried dog apples (*Malus sylvestris*, Fig. 2), herbal teas made from holly leaves (*Ilex aquifolium*, Fig. 3) and dog rose (*Rosa canina*) pseudo-fruits, and the external medicinal use of mullein (*Verbascum* spp.) mentioned only by Albanians;
- the food use of pigweed (*Amaranthus retroflexus*) and jujube (*Ziziphus jujuba*), the herbal use of ash tree (*Fraxinus excelsior*) bark, and the use of ash tree and willow (*Salix* spp.) bark as dyeing agents quoted only by Aromanians;
- the use of edible mushrooms (*Agaricus* sp. and an unidentified taxon), gentian (*Gentiana lutea*) root tea, and dandelion (*Taraxacum officinale*) as a wild vegetable mentioned only by Macedonians.

These findings are somewhat disparate from those arising from our previous field studies in the Ghegh (Northern) part of Albania (Pieroni et al., 2014a; Quave and Pieroni, 2015), where Albanians and non-Albanians (Gorani Slavs) retain a different ethnobotanical heritage, with some culturally salient plants that represent clear cultural markers in one community or the other.

This outcome may be explained by the social history of Albania during the Communist period (1946–1991), largely more significant in terms of popular support in the southern portion of the country, and for which the political regime – all over Albania – “forced” locals to work in State cooperatives, where members of different ethnic or religious

Table 2
Local uses of other domestic remedies, including plant-based remedies that are externally applied. (In bold type are those ingredients and uses mentioned by more than 50% of the informants).

Remedy	Recorded local names	Local traditional use	Same use previously recorded in Albania or SW Balkans	Quotation Index
Bear fat	<i>Dijam arit</i> ^{ALB}	Externally applied for treating wounds (esp. in the past)	Yes	0.53
Black pepper (<i>Piper nigrum</i> L., Piperaceae)	<i>Cri pipër</i> ^{MAK}	Tea: anti-diarrheal	No	0.09
Dried fruits				
Cow's buttermilk	<i>Benca</i> ^{MAK} <i>Dhallëç</i> ^{ALB}	Yogurt starter	Yes	0.09
Cow's colostrum	<i>Koloster</i> ^{ALB, MAK}	Filling for <i>bōrek</i>	No	0.09
Cow's milk	<i>Lapte de vacă</i> ^{ARO} <i>Mleko</i> ^{MAK}	Drunk hot for treating sore throats	Yes	0.31
Cow's milk or sheep milk cheese	<i>Diaf</i> ^{ALB} <i>Sirënë</i> ^{MAK}	Mixed with sugar and given to animals having digestive troubles Crumbled and externally applied for treating wounds	No	0.09
Cow's milk whey	<i>Hirr</i> ^{ALB} <i>Mashtenca</i> ^{MAK}	Heated and externally applied to sores as a suppurative Ingested for treating constipation	No	0.09
Cow's milk yogurt	<i>Streka</i> ^{MAK}	Diuretic and to treat kidney stones	Yes	0.94
Cobweb	<i>Potkvas</i> ^{MAK}	Mixed with salt and externally applied to wounds	No	0.09
Cold water	<i>Barbaghe</i> ^{ARO} <i>Padja voda</i> ^{MAK} <i>Ujë të frohtë</i> ^{ALB}	Eaten for treating diarrhea Externally applied for treating wounds	Yes	0.31
Embers	<i>Thëngjijë</i> ^{ALB}	Externally applied to wounds for treating them (animals)	Yes	0.09
<i>Haba</i> (wheat flour-based sweet confection home-made prepared by mixing roasted flour with butter, oil, and sugar, and baking the mixture)	<i>Haba</i>	Externally applied on animal belly for treating various discomforts Externally applied for treating bruises	Yes	0.09
Hen egg	<i>Jojçe</i> ^{MAK} <i>Vezë</i> ^{ALB}	Boiled and consumed for treating diarrhea Externally applied with soap for treating bruises	Yes	0.09
Human urine	<i>Urina</i> ^{MAK}	Given to animals for treating digestive discomforts	Yes	0.31
Leather belt	<i>Rip lëkurë</i> ^{ALB}	Externally applied for treating wounds	No	0.09
Mouse	<i>Maus</i> ^{ALB}	Scratched and externally applied on wounds	Yes	0.31
Olive oil (<i>Olea europaea</i> L., Oleaceae)	<i>Mashinovo maslo</i> ^{MAK} <i>Vaj ullir</i> ^{ALB}	Baby mice are macerated in oil several months; the resulting oil is instilled in the ear for treating ear-aches Instilled (warm) in the ear for treating ear inflammations	No	0.22
Fruits		Ingested for treating constipation	Yes	0.22
Scorpion	<i>Akrepi</i> ^{ALB}	Externally applied for treating snake bites in animals Macerated in oil and the resulting liquid used for externally treating scorpion bites	No	0.09
Snake	<i>Zmja</i> ^{MAK}	Fermented in a jar and the resulting liquid externally applied to wounds and skin inflammations in horses	No	0.09
Sourdough	<i>Bukë majë</i> ^{ALB}	Yogurt starter	No	0.09
Sugar	<i>Šeker</i> ^{MAK}	Ingested for treating intestinal discomforts Heated and externally applied to horse hoof inflammations	Yes	0.09
Tea (<i>Camellia sinensis</i> (L.) Kuntze, Theaceae)	<i>Čaj kinesë</i> ^{MAK}	Mixed with water (<i>sherbet</i> ^{ALB}) and given to animals for treating various discomforts Tea: given to horses for treating cough	Yes	0.06
Leaves (fermented and dried)			No	0.09
Tile	<i>Pločka</i> ^{MAK}	Pulverized and externally applied to wounds	No	0.09
Woman's breast milk	<i>Dženata mleko</i> ^{MAK} <i>Lapte de fëmijë</i> ^{ARO} <i>Qumëshiti i gruas</i> ^{ALB}	Heated and externally applied on the chest for treating cough Instilled in the ear and eyes for treating inflammations	Yes	0.09
			Yes	0.94

Table 3

Comparison of the Quotation Indexes related to the overall most cited taxa among the three studied communities (Albanians, Aromanians, and Macedonians).

Botanical taxon	Quotation Index among Albanians	Quotation Index among Aromanians	Quotation Index among Macedonians
<i>Allium cepa</i>	0.60	0.67	0.62
<i>Cornus mas</i>	0.90	0.89	0.77
<i>Cydonia oblonga</i>	0.70	0.67	0.54
<i>Hordeum vulgare</i>	0.40	0.33	0.38
<i>Juglans regia</i>	0.60	0.67	0.46
<i>Juniperus communis</i>	0.30	0.33	0.31
<i>Nicotiana tabacum</i>	0.40	0.44	0.31
<i>Origanum vulgare</i>	1.00	0.78	1.00
<i>Prunus cerasifera</i>	0.80	0.78	0.77
<i>Prunus domestica</i>	0.30	0.22	0.38
<i>Rubus ulmifolius</i>	0.20	0.33	0.38
<i>Rumex patientia</i>	1.00	0.56	0.77
<i>Secale cereale</i>	0.60	0.56	0.54
<i>Sempervivum tectorum</i>	0.40	0.44	0.31
<i>Sideritis</i> spp.	0.70	0.67	0.92
<i>Urtica dioica</i>	0.90	0.89	0.62
<i>Vitis vinifera</i>	0.70	0.89	1.00

groups living in Albania merged and possibly exchanged TEK practices, thus in turn resulting in a possible homogenization process of local plant utilizations. A similar effect on TEK by the Communist regime via its collective social organization of labor and the diffusion of folk oral knowledge and literature regarding plants has also been postulated for explaining the fairly “standardized” (if compared with that of a bordering region within Romania) medicinal plant knowledge in Southern Ukraine (Sökand and Pieroni, 2016).

4.2. Studies on folk herbal traditions in Albania: quo vadis?

The data presented in this study shows that in isolated areas of Eastern and SE Albania there is still an important traditional ethnobotanical heritage among the local elderly population.

However, this heritage, as many other studies in the Balkans have highlighted (see Pieroni and Quave, 2014a; and references therein), is under threat. Younger community members tend to migrate to Tirana or Western countries for work and they are increasingly detached from traditional agro-pastoral activities, thus interrupting the oral transmission of TEK, and subsequently the daily practice of dealing with the surrounding plant environment, which ultimately may affect their ethnobotanical knowledge.

This phenomenon is of concern in a majority of the considered villages (Qarrishtë, Osnat, Niçë, and Cerjë), which not only are located in the most economically disadvantaged territories of Albania (INSTAT, 2012) and thus Europe, but also still face a remarkable isolation particularly during the long winter months, due to the lack of a proper road infrastructure.

On the other hand, it is precisely these areas, with their pristine environments, which could develop strategic importance for the development of sustainable eco-tourism activities and the small-scale trade of local herbal and wild food plants in the region. In fact, internal rural and mountainous areas in Albania, as a consequence of the political and economic developments of the country in the last century, have been largely unaffected by industrialization and still offer an amazingly rich bio-cultural landscape. The plants and plant reports mentioned by our informants in this field study provide baseline data that, appropriately validated, could help to achieve these goals.

5. Conclusions

Plant-related TEK recorded in this field study in Eastern Albanian and NE Albania shows a remarkable, even if somewhat eroded, bio-cultural heritage related to medicinal plants, wild food plants, and other domestic remedies. The ethnobotanical data recorded in this study provides an important basis for further phytotherapeutical and nutritional research as well as possible rural development programmes.

Among the findings, the uncommon food uses of *Clematis*, *Verbascum*, and *Fraxinus* deserve further investigation. The most frequently mentioned plant ingredients in this study – *Cornus mas* fruits, *Urtica dioica* and *Rumex patientia* leaves, *Origanum* and *Sideritis* spp. aerial parts, and *Prunus cerasifera* fruits – are shared among the three ethnic communities considered (Muslim Albanians, Orthodox



Fig. 2. Dried leaves of holly (*Ilex aquifolium*) which are used for preparing diuretic teas among Albanians.



Fig. 3. Gathered dog apples (*Malus sylvestris*) drying in a field in the Albanian village of Qarrishtë.

Macedonians and Orthodox Aromanians), while less-cited taxa sometimes diverge. This indicates a certain degree of homogenization of traditional plant knowledge, which probably took place from the second half of the 20th century, during the Communist period.

Further studies in the Western Balkans should try to address the dynamics of spatial and, possibly, temporal changes of folk plant knowledge, as well as investigate in more detail the overlap and exchange of plant knowledge among diverse ethnic communities living in the same environment.

Conflict of interest

None.

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