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The disappearing wild food and medicinal plant knowledge in a few mountain villages of North-Eastern Albania

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Summary

In recent years, an increasing number of ethnobotanical investigations have focused on the documentation of folk plant knowledge systems in mountainous areas of the Balkans, as this area is considered a very important reservoir of bio-cultural heritage. An ethnobotanical field study was carried out among (Gheg) Albanians living in eight villages of North-Eastern Albania. The field survey was conducted by interviewing 45 local, elderly informants, who retain folk plant knowledge.

Sixty-three wild food and medicinal folk taxa and approx. 150 plant reports, as well as other domestic remedies, were recorded and represent a crucial portion of the local cultural heritage related to traditional food, medicinal, and veterinary practices; approximately one-third of the reports were not previously recorded in Albania or Kosovo. Among these findings, the uncommon, yet abandoned utilizations of wild pears to produce home-made vinegar, unripe wild apples, and grapes as starters/yeasts for baking, and a few unripe wild fruits, as well as beech cambium and *Sedum album* leaves as yogurt starters deserve further in-depth food technological and nutraceutical investigation. The fact that the most interesting findings are represented by obsolete and past practices and that most of the selected villages were chosen expressly because of their disadvantaged economic conditions and, in a few cases, remarkable geographical isolation, demonstrates that even in remote areas of SE Europe ethnobotanical knowledge is vanishing. Nevertheless, this study supports the idea that territories which are less economically advantaged may retain more ethnobotanical knowledge than other, more “developed” ones. Initiatives aimed at revitalizing traditional practices of wild food and medicinal plant use may be crucial in the study area for implementing rural development programs focusing on local food resources and associated small scale trade.

Keywords:

Albania; Wild Food Plants; Ethnobotany

Introduction

In recent years a number of field studies have explored the ethnobotany of pastoralist, mountainous areas of diverse Western Balkan countries, with the aim of recording a specific portion of their Traditional Environmental Knowledge (TEK), which is represented by the folk perceptions, knowledge, practices, and beliefs concerning wild food and medicinal plants (REDŽIĆ, 2006 and 2007; JARIĆ et al., 2007 and 2015; ŠARIĆ-KUNDALIĆ et al., 2010 and 2011; MENKOVIĆ et al., 2011; MUSTAFA et al., 2012a, 2012b, and 2015; REXHEPI et al., 2013; SAVIKIN et al., 2013; PIERONI and QUAVE, 2014 and references therein; ZLATKOVIĆ et al., 2014; QUAVE and PIERONI, 2015; PIERONI et al., 2017).

The inland part of the Balkan Peninsula represents a tremendous reservoir of folk knowledge on wild plants, due to both its rich bio-

diversity and ethno-religious-cultural diversity. The mountainous territories of Albania, in particular, due to their isolation and historical vicissitudes of the 20th century, and the fact that they still largely rely upon small-scale agro-pastoral economies, may present a crucial arena for recording ethnobotanical knowledge of wild species.

Local wild food and medicinal plants have been shown in recent studies to be one of the pillars of the subsistence economy of the local communities of mountainous areas in Albania, and folk knowledge and practices concerning botanicals are not only important for understanding local perceptions and uses of plants, but also for providing baseline data that could be employed in projects aimed at developing programs for a sustainable valorization of the local flora. The main goal of the present study, therefore, was to document folk food and medicinal uses of wild plants in a few isolated mountainous municipalities of NE Albania, which represent the most economically disadvantaged communities according to the most recent Albanian census (INSTAT, 2012) and also the most isolated ones. In addition, a further objective of this study was to compare the collected data with the findings of previous ethnobotanical surveys conducted in Albania and Kosovo and to identify new plant uses and reports of potential interest to the small-scale specialty food arena and herbal markets.

Materials and methods

Study area

Fig. 1 shows a map of the study area in NE Albania and the eight visited villages: six inhabited by Muslim (Gheg) Albanians: Arrën (1094 meters above sea level [masl]), Radomirë (1247 masl), Çidhen (609 masl), Grykë-Nokë (685 masl, Kalis (557 masl), and Çajë (1306 masl); one inhabited by Catholic (Gheg) Albanians: Domgjoni (649 masl); and one inhabited by “albanicized” (Muslim) Macedonians: Dovolan (615 masl). Each of the eight villages nowadays has a permanent population between approx. 100 and 500 inhabitants.

Most of the visited villages were selected for two reasons: 1) they were included in former municipalities which were among the most economically disadvantaged in Albania (taking as reference the number of TVs and washing machines per household [INSTAT, 2012]); and 2) they are located – with the exception of Dovolan – in remote mountainous areas, which are currently accessible (Arrën, Çidhen, Grykë-Nokë, Kalis) or were so until the last decade (Radomirë, Çajë, Domgjoni) only by using four-wheel drive vehicles and which remain isolated for several weeks during the snowy winters, due to the lack of a proper road infrastructure.

Field study

The field study was carried out during the summer 2016. Study participants were identified among elderly individuals who were engaged in agro-pastoral activities and still retained traditional environmental knowledge. In-depth open and semi-structured interviews were then conducted with 45 selected participants (28 men and 17 women between the ages of 45 and 85 years), with the majority of

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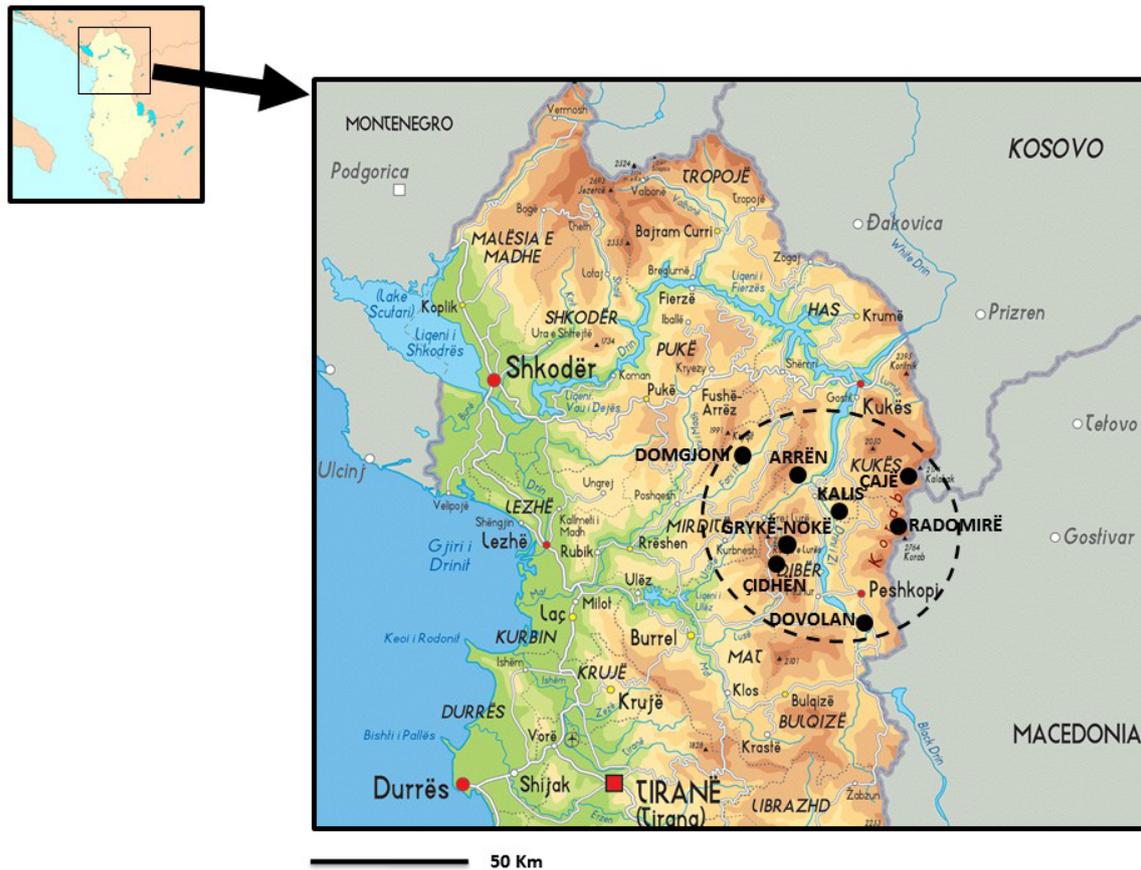


Fig. 1: Map of the study site and visited villages.

the informants, however, above 65 years of age. Study participants were asked about traditional (past and present) uses of wild plants in the food and medicinal domains, pertaining to both humans and animals, as well as the utilization of other possible domestic medicinal remedies.

To elicit these data, informants were requested to share their knowledge via one or more of the following four approaches: 1. to freelist wild plants for food and medicine they currently use or have used during their lives; 2. to quote remedies based on wild plants or other domestic ingredients they have used for treating specific pathologies (listed by the researchers); 3. to show all wild species used for food and medicine they have stored at home; 4. while on short walks around their houses and pastures, to show all wild plants they know and have used.

Specifically, the local name(s) of each reported taxon, plant part(s) used, and in-depth details about their manipulation/preparation and food or medicinal use(s) 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. 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 strictly followed. During the interviews, informants were always asked to show the reported plants (fresh or dried) or to describe the plants and their ecology (if the plants were not available). Voucher specimens of all the species that were shown in the current study had been collected during previous fieldwork conducted in the neighboring areas of Gora and Gollobordo (PIERONI et al., 2014a; QUAVE and PIERONI, 2015) and are stored at the Herbaria of the Uni-

versity of Camerino (CAME, Italy), University of Pristina (PRN, Kosovo), and Emory University (GEO, USA). The taxonomic identification followed the official *Flora of Albania* (PAPARISTO et al., 1988; QOSIA et al., 1992 and 1996; VANGJELI, 2000), while the botanical nomenclature and family assignments followed THE PLANT LIST (2013), and the Angiosperm Phylogeny Group IV (STEVENS, 2016), respectively. Local plant names were transcribed following the rules of standard Albanian.

Data analysis

The collected field data were compared with the available ethnobotanical literature of Albania (PIERONI et al., 2005, 2011, 2014a, 2014b, 2015, and 2017; PIERONI, 2008; QUAVE and PIERONI, 2014 and 2015) and Kosovo (SEJDIU, 1984; MUSTAFA et al., 2012a, 2012b, and 2015; PIERONI et al., 2017).

Results and discussion

A total of sixty-three wild food and medicinal folk taxa and approx. 150 plant reports, as well other domestic remedies, were recorded in the study area.

Wild food plants and wild teas

Tab. 1 presents the plant-based wild foods and teas mentioned by the informants. In the category “teas” we included all those infusions or decoctions locally prepared and drunk as recreational beverages, as well those drunk and ingested in order to obtain a specific, perceived therapeutic effect.

Tab. 1: Wild food plants and their traditional uses recorded in the study area (a few cultivated and semi-domesticated plants used in uncommon ways are also included)

<i>Botanical taxon, family, used parts, and voucher specimen code(s)</i>	<i>Recorded local name(s)</i>	<i>Traditional food use and eventually perceived medicinal value (treated disease)</i>	<i>Similar use(s) previously recorded among Albanians in Albania and Kosovo</i>
<i>Allium triquetrum</i> L. (Amaryllidaceae) (?) Aerial parts (fresh)	<i>Purris, Pras e egër</i>	Filling for pies, esp. white maize flour-based pies (<i>peta, ljaknur, ljakrur</i>)	Partially
<i>Amaranthus retroflexus</i> L. (Amaranthaceae) Leaves (fresh)	<i>Llaboda</i>	Filling for pies	Yes
<i>Artemisia absinthium</i> L. (Asteraceae) Aerial parts	<i>Pelîn^{DOV}</i>	Tea: stomach-ache, diarrhea	Yes
<i>Asplenium trichomanes</i> L. and possibly also <i>Ceterach officinarum</i> Willd. (Aspleniaceae) Aerial parts (dried) CAME26293 (<i>A. trichomanes</i>)	<i>Fir guri, Fir i egër</i>	Tea: kidney stones	Yes
<i>Cornus mas</i> L. (Cornaceae) Fruits (fresh and dried) CAME-26279 PRN-23/Pz/2013	<i>Thona, Thana, Drenila^{DOV}</i>	Consumed raw or dried: stomach-ache, ulcers; tea: diarrhea; compote: diarrhea; syrup: cardiotoxic, diarrhoea; fermented and distilled in raki: cardiotoxic, diuretic, blood depurative, anti-hypertensive; fermented in water a few weeks to obtain vinegar (uthull): cold	Partially
<i>Crataegus monogyna</i> Jacq. and possibly other <i>Crataegus</i> spp. (Rosaceae) Fruits (fresh) CAME26280	<i>Morrisi</i>	Consumed raw as a snack*	Yes
<i>Fagus sylvatica</i> L. (Fagaceae) Wood CAME-26249	<i>Ahu</i>	Ground, mixed together with corn flour for making bread*	No
<i>Fragaria vesca</i> L. (Rosaceae) Fruits (fresh) CAME26247	<i>Dreza, Lulestrydhe</i>	Consumed raw as a snack	Yes
<i>Hordeum vulgare</i> L. (Poaceae) Fruits (dried)	<i>Elbi</i>	Bread*	Yes
<i>Hypericum perforatum</i> L., (Hypericaceae) Flowering aerial parts GEO-020051 PRN-36/Pz/2013	<i>Lulë kuqë</i>	Tea: recreational	Yes
<i>Juglans regia</i> L. (Juglandaceae) Seeds and kernels CAME26238	<i>Arra</i>	Consumed fresh and dried, as a snack, often together with honey: restorative; tea (kernel): cough	Yes
<i>Juniperus communis</i> L. (Cupressaceae) Cones (fresh and dried) CAME26253	<i>Dëllinjë</i>	Distilled to obtain <i>raki</i> : digestive; fermented beverage (prepared by leaving the cones in water); tea: kidney problems and cough	Yes
<i>Malus sylvestris</i> (L.) Mill. (Rosaceae) Unripe fruits (fresh)/ Fruits (fresh and dried) CAME26288	<i>Molla e egër</i>	Unripe fruits were added to dough as a yeast/ starter during the process of making bread, when sourdough was not available*; ripe fruits, fermented in water a few weeks, to produce vinegar (<i>uthull</i>), which is used for treating cold; <i>oshaf</i> : dried fruits are boiled and both the cooked fruits and the resulting liquid ingested	Partially
<i>Matricaria chamomilla</i> L. (Asteraceae) Flowering tops (dried) CAME26235	<i>Kamomili</i>	Tea: stomach-ache, digestive	Yes
<i>Origanum vulgare</i> L. (Lamiaceae) Flowering aerial parts (dried) GEO-020049 PRN-52/Pz/2013	<i>Çaj, Çaj i egër, Çaj mali, Çaj bjeshke</i>	Tea: recreational/panacea, sore throat, cough, head-ache	Yes

<i>Plantago major</i> L. (Plantaginaceae) Inflorescences (dried) GEO-020043 PRN-54/Pz/2013	<i>Bar preme, Bar premi, Bar premti</i>	Tea: diuretic	Yes
<i>Primula veris</i> L. (Primulaceae) Flowering tops (dried) GEO-020060 PRN-56/Pz/2013	<i>Lule aguliçe</i>	Tea: diuretic, cough	Partially
<i>Prunus avium</i> (L.) L. and <i>P. cerasus</i> L. (Rosaceae) Fruit peduncles (dried) CAME26240 (<i>P. avium</i>) CAME26298 (<i>P. cerasus</i>)	<i>Qersh</i>	Tea: diuretic	Yes
<i>Prunus cerasifera</i> Ehrh. (Rosaceae) Fresh fruits CAME26266	<i>Kaisi, Kaisi e egër, Kumbull e egër</i>	Fermented and distilled in raki: cardiogenic, blood depurative	Yes
<i>Pyrus communis</i> L. (Rosaceae) Bark	<i>Dardhë</i>	Tea: diarrhea	No
<i>Pyrus pyrastrer</i> (L.) Buirgsd. (Rosaceae) Fruits (fresh and dried) CAME26244	<i>Dardhë e egër</i>	Compote; <i>oshaf</i> : dried, then boiled (both the cooked fruit and the resulting liquid ingested); home-made vinegar (<i>uthull</i>): cold	Partially
<i>Rosa canina</i> L. (Rosaceae) Pseudofruits (dried) CAME26237	<i>Kaç</i> <i>Shipunka</i> ^{DOV}	Tea: sore throat, cough, flu; boiled in water and slightly fermented to obtained a gassy, sour beverage (lënge)	Yes
<i>Rubus ulmifolius</i> Schott (Rosaceae) Fruits/Young shoots CAME26310	<i>Manaferra</i>	(Fruits) consumed raw as a snack; fermented and distilled in <i>raki</i> / (Young shoots) tea: diarrhea in children	Partially
<i>Rubus ideaus</i> L. (Rosaceae) Fruits (fresh)	<i>Mjedra, Njetra</i>	Consumed raw as a snack	Yes
<i>Rumex acetosa</i> , <i>R. acetosella</i> L., and <i>R. pulcher</i> L. (Polygonaceae) Leaves (fresh) CAME26243 (<i>R. acetosa</i>)	<i>Uthulla, Liakra e bjeske</i>	Consumed raw as a snack: filling for pies	Partially
<i>Rumex patientia</i> L. and possibly other <i>Rumex</i> spp. (Polygonaceae) Leaves CAME26285	<i>Elqeta, Lepjeta, Lepjeta e egër, Leqeta, Liakra e egër, Lakneshita, Liqet</i>	Filling for pies	Yes
<i>Salvia officinalis</i> L. (Lamiaceae) Leaves (dried)	<i>Sherbela</i>	Tea: sore throat, cough, liver protective, cardiogenic	Partially
<i>Satureja montana</i> L. (Lamiaceae) Aerial parts	<i>Trumza</i>	Tea: recreational	Yes
<i>Sideritis raeseri</i> Boiss. & Heldr. and possibly <i>S. scardica</i> Griseb., Lamiaceae Flowering aerial parts (dried) CAME26281 (<i>S. raeseri</i>)	<i>Çaj, Çaj të bardhë, Çaj fushe</i>	Tea: recreational/panacea, sore throat, cough	Yes
<i>Solanum lycopersicum</i> L. (Solanaceae) Unripe fruits	<i>Domate</i>	Soup	No
<i>Taraxacum officinale</i> Weber (Asteraceae) Leaves CAME26289	<i>Qumstore</i>	Filling for <i>börek</i> (<i>peta</i>)	No
<i>Thymus ongicaulis</i> C.Presl (Lamiaceae) Aerial parts CAME26272	<i>Lisën</i>	Seasoning; tea: different ailments	Yes
<i>Triticum monococcum</i> L. (Poaceae) Grainà → Flour	<i>Tep</i>	Mixed with maize flour for baking bread*	No
<i>Urtica dioica</i> L. (Urticaceae) Leaves (fresh) and roots CAME26262	<i>Hitha, Hithal</i>	Filling for pies or consumed boiled; tea: rheumatisms; tea (roots): colitis	Yes

<i>Vaccinium myrtillus</i> L. (Ericaceae) Fruits (fresh and dried) GEO-020040 PRN-87/Pz/2013	<i>Borovnica</i> , <i>Qershia e egër</i>	Consumed raw as a snack; tea: cough, blood depurative, cardi tonic; fermented beverage	Partially
<i>Vitis vinifera</i> L. (Vitaceae) Unripe fruits (fresh)/Fruits (fresh)	<i>Rrush</i>	Unripe fruits are added to dough as a yeast/starter during the process of making bread, when sourdough is not available*; ripe fruits are consumed fresh in winter for counteracting cold and flu; sometimes they are fermented in water a few weeks to naturally obtain vinegar (<i>uthull</i>): vinegar is heated with hot stones to eliminate possible alcohol and drunk as a digestive; ripe fruits can be fermented and distilled in <i>raki</i> , which is drunk for treating stomach-aches and digestive complaints	Partially
<i>Zea mays</i> L. (Poaceae) Stigma	<i>Kolomoç</i>	Tea: diuretic	Yes
Unidentified taxon - aerial parts (fresh)	<i>Bar miseli</i>	Tea: cardi tonic	No

(?): identification based only on plant description and folk name; *: past use; ^{DOV}: folk name remembered and recorded in the “albanicized” Macedonian village of Dovolan; plants and uses mentioned by more than 50% of the informants are reported in bold.

Forty-five folk wild taxa were recorded, for which we documented local name(s), taxonomic family, voucher code(s), used plant part(s), local food or herbal use(s), and their correspondence with the entire ethnobotanical literature of Albanians living in Albania and Kosovo.

Approximately one-fifth of the recorded folk reports were not previously recorded in Albania and Kosovo.

Among the most uncommon uses, the following are worth mentioning: a soup made from unripe tomatoes; the use of *Taraxacum* in pies, which is commonly used in the folk cuisines of Slavic populations in the Balkans but not much among Gheg Albanians (ŁUCZAJ et al., 2013; PIERONI et al., 2014a); the production of home-made vinegar starting from wild pears; and the obsolete (past) uses of beech wood for making bread as well as unripe wild dog apples and grapes as starters/yeasts for baking bread.

The most commonly cited *wild* food and herbal plants mentioned by the study participants (in bold in Tab. 1) included *Cornus mas* (fruits, processed in many ways), *Origanum vulgare* (flowering aerial parts, in teas), and *Urtica dioica* and *Rumex patientia* (leaves, both considered very important wild leafy vegetables).

Plant-based yogurt starters

Tab. 2 indicates the domestic ingredients (mainly plant-based) that the informants remembered to have been used as home-made yogurt starters (i.e. starters used in the absence of previously produced yogurt). The entire set of mentioned plants listed in the table have never been recorded for such utilizations in the most globally inclusive economic botanical literature (HEDRICK, 1972; FACCIOLA, 1998) and therefore deserve further investigation.

In particular, the use of a few unripe wild fruits, as well as beech (*Fagus sylvatica*) cambium and fresh *Sedum album* leaves, as yogurt starters warrant further in-depth food technological and nutraceutical evaluation and investigation.

Moreover, the fact that all the mentioned uses refer to forest and mountain products, which were probably available during the transhumance period spent in the higher Alpine pastures during summer, recalls traces of archaic pastoralist food customs.

External plant remedies for curing humans and plant remedies used for treating animals

Tab. 3 and 4 present the external plant remedies pertaining to humans mentioned by the informants (as well as those few other do-

mestic, external remedies arising from animal sources) and domestic (mainly plant-based) ethnoveterinary remedies, respectively.

As in the previous tables, folk names and exact detailed, local, traditional uses are reported.

Those ingredients and reports that were mentioned by more than half of the study participants are highlighted in bold type. The majority of the recorded plant reports, especially those devoted to animal health, were used in the past and have been abandoned nowadays.

Comparison with Albanian and Kosovar ethnobotanics

Most of the recorded wild food and medicinal plant uses had been previously documented in other mountainous areas of Albania and Kosovo, although a few reports found in this study are novel.

Among the food plant uses, these new reports include all reports related to species utilized as (past) yogurt starters, as well as the uses of ground beech wood and emmer wheat flour – mixed with maize flour – for making bread, unripe tomatoes for preparing a specific sour soup, and dandelion leaves, as (bitter) filling for home-made *börek*. These reports can be explained by the permanence of archaic plant utilizations in the study area, which may be linked to its long history of isolation and famine and its ancestral pastoralist economy, which has left traces that possibly disappeared much earlier in other mountainous areas of Albania and Kosovo.

In the medicinal domain, we recorded a few interesting “unknown” plant uses, which should be maybe further investigated pharmacologically, such as fresh garlic for externally treating eye inflammations, fresh crushed nettle leaves for externally treating cuts, buttermilk for externally treating snake bites, as well as walnut teas, juniper berries, dwarf elderberry roots and elderberry branches for externally treating various skin problems in animals.

All these reports demonstrate an interesting permanence of a few still living or remembered ethnoveterinary treatments. The last traces of uncommon folk veterinary practices recorded in this study, as well as the past uses of wild plants as yogurt starters, attest an original bulk of TEK in NE Albania that shows the remarkable pastoralist attitudes and skills of the study communities.

TEK in mountainous areas of Albania: quo vadis?

The study sites were selected because of their disadvantaged economic situation and isolation, however, a relevant portion of the practiced TEK recorded in the present study refers only to recent

Tab. 2: Traditional, domestic *yogurt starters* mentioned and used in the study area in the past

<i>Ingredient (botanical taxon, family, and used parts)</i>	<i>Recorded local name(s)</i>	<i>Similar use previously recorded among Albanians in Albania and Kosovo</i>
PLANTS		
<i>Fagus sylvatica</i> L. (Fagaceae) Cambium	See Tab. 1	No
<i>Fragaria vesca</i> L. (Rosaceae) Unripe fruits	See Tab. 1	No
<i>Hypericum perforatum</i> L. (Hypericaceae) Fresh aerial parts	See Tab. 1	No
<i>Malus sylvestris</i> Mill. (Rosaceae) Unripe fruits	See Tab. 1	No
<i>Prunus cerasifera</i> Ehrh. (Rosaceae) Unripe fruits	See Tab. 1	No
<i>Prunus domestica</i> L. (Rosaceae) Unripe fruits	See Tab. 1	No
<i>Rumex acetosa</i> L., <i>R. acetosella</i> L., and <i>R. pulcher</i> L. (Polygonaceae) Fresh leaves	See Tab. 1	No
<i>Sedum album</i> L. (Crassulaceae) Fresh leaves	<i>Rrush i egër, Rrush guri, Rrush i uiku</i>	No
<i>Vitis vinifera</i> L. (Vitaceae) Unripe fruits	See Tab. 1	No
OTHER INGREDIENTS		
Ants	<i>Milingonë</i>	Yes
Clarified butter	<i>Tylënë</i>	No
Rain	<i>Shi</i>	No
Yogurt (sour) buttermilk	<i>Dhallët</i>	Yes

Tab. 3: Traditional external remedies recorded in the study area

<i>Remedy (botanical taxon, family, used parts, and voucher specimen code(s))</i>	<i>Recorded local name(s)</i>	<i>Traditional preparation and medicinal value/treated disease</i>	<i>Similar use(s) previously recorded among Albanians in Albania and Kosovo</i>
PLANTS			
<i>Achillea millefolium</i> L. (Asteraceae) Fresh leaves CAME26294	<i>Bar premi</i>	Crushed and topically applied on cuts as an haemostatic and cicatrizer	Yes
<i>Allium cepa</i> L. (Amaryllidaceae) Bulb	<i>Qepë</i>	Crushed, mixed with salt, and topically applied for curing bruises	Yes
<i>Allium porrum</i> L. (Amaryllidaceae) Leaf juice	<i>Prash</i>	Instilled in the ear for treating ear inflammations	Yes
<i>Allium sativum</i> L. (Amaryllidaceae) Fresh bulb	<i>Hudhra</i>	Crushed and applied on the eye region for treating inflammations	No
<i>Cornus mas</i> L. (Cornaceae) Fresh fruits	See Tab. 1	Fermented into vinegar (<i>uthull</i>); applied on snake bites* or applied to the head for treating lice; fermented and distilled into <i>raki</i> , which is topically applied for disinfecting cuts, treating tooth-aches, eye inflammations, and ear-aches	Partially
<i>Malus sylvestris</i> (L.) Mill. (Rosaceae) Fresh fruits	See Tab. 1	Fermented into vinegar (<i>uthull</i>); this is applied on snake bites* or applied to the head for treating lice	Partially
<i>Nicotiana tabacum</i> L. (Solanaceae) Dried leaves	<i>Duhan</i>	Topically applied on cuts as a haemostatic	Yes

<i>Plantago lanceolata</i> L. (Plantaginaceae) Fresh leaves CAME26284	<i>Bar premti</i>	Topically applied as a cicatrizer	Yes
<i>Plantago major</i> L. (Plantaginaceae) Fresh leaves	See Tab. 1	Topically applied as a suppurative	Yes
<i>Prunus cerasifera</i> Ehrh. (Rosaceae) Fresh fruits	See Tab. 1	Fermented and distilled into <i>raki</i> ; this is topically applied for disinfecting cuts, treating tooth-aches, eye inflammations, and ear-aches	Partially
<i>Prunus domestica</i> L. (Rosaceae) Fresh fruits	<i>Kumbull</i>	See <i>Prunus cerasifera</i>	Partially
<i>Sempervivum tectorum</i> L. (Crassulaceae) Leaf juice GEO-020035 PRN-71/Pz/2013	<i>Bar veshe</i>	Instilled in the ear for treating ear inflammations	Yes
<i>Solanum lycopersicum</i> L. (Solanaceae) Fresh leaves	<i>Domate</i>	Considered a mosquito repellent	No
<i>Urtica dioica</i> L. (Urticaceae) Fresh leaves	See Tab. 1	Crushed and topically applied for treating cuts and bruises	No
<i>Vitis vinifera</i> L. (Vitaceae) Juice of the fresh shoots and fresh fruits	See Tab. 1	Juice is instilled in the ear for treating ear inflammations; fresh fruits are fermented into vinegar (<i>uthull</i>) and this is applied on snake bites* or to the head for treating lice; the fresh fruits are fermented and distilled into <i>raki</i> and this is topically applied for disinfecting cuts, treating tooth-aches, eye inflammations, and ear-aches	Yes
Diverse tree species Wood		Burned into ash (<i>fain</i>), which is then boiled in water and topically applied, as an anti-lice agent and for treating cuts*	Yes
OTHER INGREDIENTS			
Bear fat	<i>Dhjam ariu</i>	Extracted and stored; as an alternative, slices of meat and fat are dried as <i>pastrma</i> ; these are heated before use and the resulting melted fat is topically applied for treating burns	Yes
Cow milk	<i>Qumështi i lopës</i>	Topically applied to treat eye inflammations	Yes
Curdle	<i>Djathi i bardhë</i>	Topically applied to treat eye inflammations	Yes
Egg	<i>Vezë</i>	The yolk is topically applied on eye inflammations	No
Hare	<i>Ljepur</i>	The meat is fried and consumed for treating gunshot wounds*	No
Hen anus	<i>Bytha e pulës</i>	Topically applied on snake bites, which “sucks out” the poison; the hen dies and is thrown away afterwards*	Yes
Human urine	<i>Urinë</i>	Topically applied on wounds	Yes
Leather	<i>Lëkurë</i>	Rubbed on cuts, as an haemostatic; burned, the resulting smoke is considered a snake repellent	Partially
Snake (not specified)	<i>Gjarpër</i>	Macerated in oil for several months in the sun, the resulting extract is topically applied for treating burns*; snake head topically applied on the spot where the same snake had bitten*	No
Yogurt (sour) buttermilk	See Tab. 2	Topically applied on snake bites	No
Woman milk	<i>Tomël i gruas</i>	Topically applied to relieve eye and ear inflammations*	Yes

*: past uses; plant remedies and related uses mentioned by more than 50% of the informants are reported in bold.

Tab. 4: Ethnoveterinary remedies recorded in the study area

<i>Remedy (botanical taxon, family, and used parts)</i>	<i>Recorded local name(s)</i>	<i>Traditional preparation and medicinal value/ treated disease</i>	<i>Similar use(s) previously recorded among Albanians in Albania and Kosovo</i>
PLANTS			
<i>Hordeum vulgare</i> L. (Poaceae) Fruits	See Tab. 1	Boiled in water; the vapours are inhaled by the animal for curing respiratory problems*	No
<i>Juglans regia</i> L. (Juglandaceae) Unripe pericarps and kernels	See Tab. 1	Tea (unripe pericarps): externally applied for treating cow horn infections and skin cuts; decoction (unripe kernels): instilled in the ear for treating ear-aches	No
<i>Juniperus communis</i> L. (Cupressaceae) Cones	See Tab. 1	Externally applied on wounds*	No
<i>Nicotiana tabacum</i> L. (Solanaceae) Stems	See Tab. 3	Decoction: in external washes as an anti-parasitic	No
<i>Pinus</i> spp. (Pinaceae) Resin	<i>Pisha</i>	Topically applied on wounds and broken bones*	Yes
<i>Prunus cerasifera</i> Ehrh. (Rosaceae) Fresh fruits	See Tab. 1	Fermented and distilled into <i>raki</i> ; this is given to animals for treating diverse internal complaints	Partially
<i>Salvia officinalis</i> L. (Lamiaceae) Leaves	See Tab. 1	Tea: cough; rheumatism	Partially
<i>Sambucus ebulus</i> L. (Adoxaceae) Roots CAME26254	<i>Kigël</i>	Inserted into the animal's ear for treating various diseases (goats, sheep); decoction: in external washes to disinfect the skin (all animals)*	No
<i>Sambucus nigra</i> L. (Adoxaceae) Branches and bark PRN-69/Pz/2013	<i>Shtog</i>	Mixed (aerial parts) with butter or (bark) with butter and lime water, topically applied for treating burns	No
<i>Tilia platyphyllos</i> Scop. (Malvaceae) Flowers CAME26241	<i>Lule blini</i>	Tea: respiratory problems*	No
<i>Ulmus minor</i> Mill. and possibly other <i>Ulmus</i> spp., <i>Ulmaceae</i> Bark CAME26308	<i>Vidh</i>	Decoction: topically applied as a cicatrizer	Yes
<i>Vitis vinifera</i> L. (Vitaceae) Fresh fruits	See Tab. 1	Fermented and distilled into <i>raki</i> ; this is given to animals for treating diverse internal complaints	Partially
<i>Zea mays</i> L. (Poaceae) Fruits	See Tab. 1	Boiled and given as food for treating internal gastro-intestinal problems	No
OTHER INGREDIENTS			
Bees wax	<i>Dyll bletesh</i>	Topically applied for treating eye inflammations	No
Egg	See Tab. 3	Fried and applied on cuts or ingested raw for counteracting bruises	No
Hen anus	See Tab. 3	Topically applied on snake bites, which "sucks out" the poison; the hen dies and is thrown away afterwards*	Yes
Mouton fat	<i>Dhjam deleje</i>	Burned, topically applied for treating wounds	No
Yogurt (sour) buttermilk	See Tab. 2	Given to constipated animals	No

*: past uses.

past folk plant uses which therefore indicates that it is remarkably eroded. The ethnobotanical heritage of the region is under threat for many reasons, but the key factor is the urbanization and migration process, which 25 years after the fall of Communism is still on-going in rural and mountainous areas of Albania. Young and middle-aged community members still migrate to Tirana or Western countries for

work and they are more and more 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 affects the permanence of ethnobotanical knowledge.

The elderly portion of the population, which remains in the mountain

villages, is still well connected to the traditional lifestyle, but they also highly rely upon remittances from relatives.

On the other hand, it is precisely these mountainous areas, with their pristine environments, which could become of 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 during the last century, have been largely unaffected by industrialization and still offer an amazingly rich bio-cultural landscape. Conversely, the fact that the aforementioned social changes contribute to the disappearance of TEK has to be of great concern, as eco-tourism and small-scale chains of specialty foods and herbal products can only be put in place upon the permanence of local folk knowledge systems.

Conclusions

This study contributes to the documentation of vanishing Traditional Environmental Knowledge and research on the influence of isolation and economic disadvantage on the preservation of TEK. Despite the number of past studies conducted within Albania, the present research still provided several folk plant uses that had never been previously reported.

The plants and folk plant uses mentioned by the informants in this field study offer an important set of data, and, we hope inspirations, which could be used to promote a germane re-vitalization and valorization of the TEK still retained by the visited local communities.

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