

Local Knowledge on Plants and Domestic Remedies in the Mountain Villages of Peshkopia (Eastern Albania)

Andrea PIERONI^{1*}, Anely NEDELICHEVA², Avni HAJDARI³, Behxhet MUSTAFA³, Bruno SCALTRITI¹, Kevin CIANFAGLIONE⁴, Cassandra L. QUAVE⁵

¹ University of Gastronomic Sciences, Piazza Vittorio Emanuele 9, Pollenzo (Cuneo) I-12042, Italy

² Department of Botany, University of Sofia, Blv. Dragan Tzankov, Sofia 1164, Bulgaria

³ Department of Biology, University of Prishtina "Hasan Prishtina", Mother Teresa Str., Prishtinë 10000, Republic of Kosovo

⁴ School of Biosciences and Veterinary Medicine, University of Camerino, Via Pontoni 5, Camerino (Macerata) I-62032, Italy

⁵ Center for the Study of Human Health, Emory University, 550 Asbury Circle, Candler Library 107E, Atlanta, GA 30322, USA

*Corresponding author, e-mail: a.pieroni@unisg.it; Tel: +39 0172 458575; Fax: +39 0172 458500

Citation: Pieroni A, Nedelcheva A, Hajdari A, et al. (2014) Local knowledge on plants and domestic remedies in the mountain villages of Peshkopia (Eastern Albania). *Journal of Mountain Science* 11(1). DOI: 10.1007/s11629-013-2651-3

© Science Press and Institute of Mountain Hazards and Environment, CAS and Springer-Verlag Berlin Heidelberg 2014

Abstract: Ethnobotanical studies in the Balkans are crucial for fostering sustainable rural development in the region and also for investigating the dynamics of change of Traditional Ecological Knowledge (TEK), which has broad-sweeping implications for future biodiversity conservation efforts. A survey of local botanical and medical knowledge and practices was conducted in four mountainous villages of the Peshkopia region in northeast Albania, near the Macedonian border. Snowball sampling techniques were employed to recruit 32 informants for participation in semi-structured interviews regarding the use of the local flora for food, medicinal, veterinary and ritual purposes. The uses of 84 botanical taxa were recorded as well as a number of other folk remedies for the treatment of both humans and livestock. Comparison of the collected data with another ethnobotanical field study recently conducted among Albanians living on the Macedonian side of Mount Korab shows a remarkable divergence in medicinal plant uses, thus confirming the crucial role played by the history of the last century in transforming TEK. Most noteworthy, as a legacy of the Communist period, a relevant number of wild medicinal taxa are still gathered only for trade rather than personal/familial use. This may lead to

unsustainable exploitation of certain taxa (i.e. *Orchis* and *Gentiana* spp.) and presents some important conservation challenges. Appropriate development and environmental educational frameworks should aim to reconnect local people to the perception of limitation and renewability of botanical resources.

Keywords: Ethnobotany; Albania; Mount Korab; Medicinal Plants; Wild Food Plants

Introduction

In recent years, several field studies conducted in South-Eastern Europe have highlighted the rich bio-cultural diversity and a remarkable vitality of traditional plant knowledge in this region (Brussell 2004; Dogan et al. 2008; Jarić et al. 2007; Kołodziejska-Degórska 2012; Kültür 2007; Kültür and Sami 2009; Kültür and Sami 2008; Menković et al. 2011; Mustafa et al. 2012a and 2012b; Nedelcheva 2011; Nedelcheva and Dogan 2009, 2011; Nedelcheva et al. 2007; Papp et al. 2011; Papp et al. 2013; Pieroni 2012; Pieroni et al. 2011; Redžić 2007, 2010a, 2010b; Redžić 2006; Šarić-Kundalić et al. 2010, 2011; Savikin et al. 2013).

Received: 7 January 2013

Accepted: 23 May 2013

This same area, and especially the Western Balkans, are crucial in the current worldwide “herbal landscape” (Söukand and Kalle 2010) as a large portion of the European market of medicinal and aromatic plants is currently gathered and traded from there (Kathe et al. 2003). In particular, the Albanian mountains also represent a very promising hotspot for recording traditional botanical knowledge (Pieroni 2008, 2010; Pieroni et al. 2005), largely because of their geographical and historical features, including the long period of “isolation” and the absence of industrialisation processes during Communist times (1945-1991) during which locals were able to foster a remarkable resilience of traditional lifestyles and annexed folk practices. Moreover, this local botanical knowledge in the Albanian highlands, to which a few famous Albanologists paid limited attention in the past Century (Cozzi 1909, 1914; Doda and Nopcsa 2007; Durham 1923), is still largely unexplored.

This knowledge has been postulated in turn to potentially play a crucial role in the development of community-based management strategies of local natural resources and of the rural and mountainous agro-biodiversity, as well as sustainable eco-tourism and high-quality niche food and herbal products (Pieroni 2008). Moreover, Mount Korab (2,764 m a.s.l.) of the Šar Mountains around Peshkopia (locally often referred to as Dibër) is famous for having a long tradition of past and present collection of wild medicinal herbs for trade (Londoño 2008).

In 1912, the borders of the Republic of Albania were established and the Albanians of Mount Korab were separated between the state of Albania and territories that were part of the former Kingdom of Serbia (later Kingdom of Serbs, Croats and Slovenes and Yugoslavia), nowadays in the Republic of Macedonia. In a previous study, the resilience of ethnobotanical knowledge of Albanians living on the Macedonian side of the Mount Korab (Pieroni 2013) was assessed; this was planned in order to analyze temporal changes of local

botanical knowledge between the two mountain sides. This study was likewise designed with the following two central aims:

- 1) Assess the local knowledge related to wild plant foods, medicinal botanicals, and animal remedies in order to foster local activities of sustainable gathering and trade of wild plants;
- 2) Reflect upon the historical trajectories that may have affected local plant uses on the Albanian side of Mount Korab.

1 Materials and Methods

1.1 Study area

This study was conducted in four Mount Korab villages of the Peshkopia area, in Eastern Albania: Bellovë (979 m a.s.l.), Rabdisht (1,234 m a.s.l.), Cerjan (1,311 m a.s.l.), and Zagrad (1,556 m a.s.l.) (Figure 1). The official population of these villages on 1st January 2012 as counted by the statistics of the local regional government of the district of Dibër was considered to be around 1,200 inhabitants (Zagrad 139; Cerjan 143; Bellovë 368; Rabdisht 522), but the actual estimate provided by the local population regarding the inhabitants who live in the villages throughout the entire year is at least 30% to 40% smaller.

The landscape around these villages is dominated by beech and fir forests and meadows at the feet of Mount Korab (Albanian: Maja e Korabit or Mali i Korabit; Macedonian: Golem Korab;

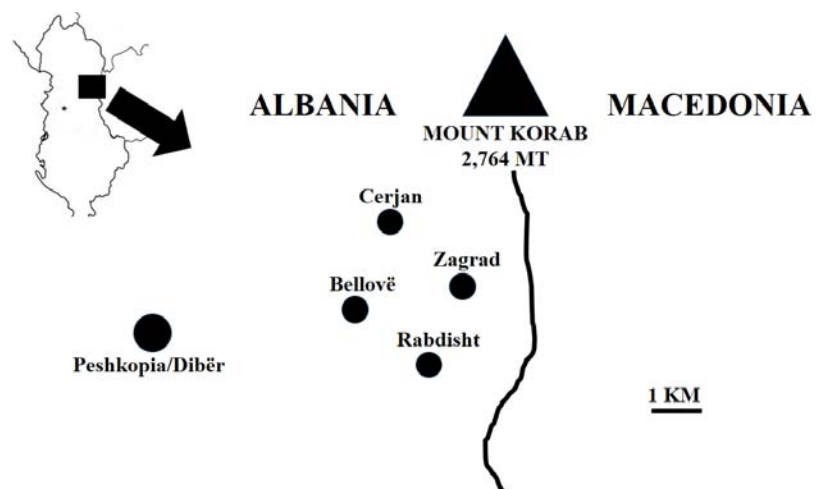


Figure 1 The study area: four Mount Korab villages (Bellovë, Rabdisht, Cerjan, and Zagrad) of the Peshkopia area, in Eastern Albania.

2,764 m a.s.l.), whose Macedonian side is an integral part of the Mavrovo National Park. The climate of this area is Alpine with heavy snowfalls in winter. The entire Mount Korab is estimated to host more than 1,000 species of higher plants, including several endemic taxa, which have been confirmed on the Macedonian side (among them: *Achillea korabensis* (Heimerl) Micevski, *Crepis macedonica* Kitanov, *Dianthus macedonicus* Micevski, *Erysimum korabense* Kumm. & Jáv., *Sesleria korabensis* (Kumm. & Jáv.) Deyl. and others) (Matevski 2010), as well as a rich faunal biodiversity, which includes wild goats, bears, lynxes, wild cats, imperial and golden eagles.

1.2 Field study

In October 2012, in-depth open and semi-structured interviews were conducted with community members (n = 32, age between 9 and 83 years old) in the four villages, which were selected using snowball sampling techniques. Informants were asked about traditional uses of food, medicinal, and ritual plants (in use until a few decades ago or still in use nowadays). Specifically, informants were questioned about the local name(s) of each quoted taxon, the plant part(s) used, in-depth details about its/their manipulation/preparation and actual medicinal or food use(s). Moreover, we also documented information on locally used non-plant “domestic” remedies.

Interviews were conducted in Albanian with the help of a simultaneous translator. Prior informed consent was always verbally obtained prior to conducting interviews and researchers adhered to the ethical guidelines of the American Anthropological Association (AAA 2012). During the interviews, informants were always asked to show the quoted plants. Digital pictures and voucher specimens were taken for the wild taxa, when available, and are deposited at the Herbarium of the University of Gastronomic Sciences. Taxonomic identification was conducted by the first author according to Flora of Albania (Paparisto 1988-2000), and, whenever possible, Flora Europaea (Tutin et al. 1964-1980). Family assignments follow the Angiosperm Phylogeny Group III system (Stevens 2012). Lichens nomenclature follows the Checklist of lichens and lichenicolous fungi of Albania (Hafellner 2013).

Local names were transcribed following the rules of Ghegh Albanian standard language.

1.3 Data analysis

The collected data were compared with the findings from a previous study, which was conducted on the Macedonian side of the same Mount Korab (Pieroni 2013), as well as with the most relevant recent Western Balkan ethnobotanical surveys (Mustafa et al. 2012a; Mustafa et al. 2012b; Pieroni 2008; Pieroni et al. 2005; Pieroni et al. 2011; Rexhepi et al. 2013) and – given the proximity of the study area to the Macedonian-Bulgarian cultural regions – with a few Bulgarian folk medical and ethnographic reviews (Georgiev 1999; Marinov 2003; Vakarelski 1977).

2 Results and Discussion

2.1 Ethnobotanical knowledge and practices of the mountainous villages of Peshkopia

The food, medicinal, and ritual uses of 84 local plants recorded in the study area are reported in Table 1. Importantly, in addition to species used for household food and healthcare practices, the taxa wild-crafted (30) or cultivated (1) for sale on trade networks are highlighted here as well. Sixty-three of the recorded taxa are wild and they represent only 6% of higher plant biodiversity of the Mount Korab.

Among the recorded plant practices, a few uncommon uses of plants (as compared with the Mediterranean ethnobotanical literature) emerge and could merit further exploration in future nutritional and pharmacological studies:

- young leaves of *Cydonia oblonga* and *Primula veris*, as wrapping material for home-made sarma (traditional feast preparation of the territories of the former Ottoman Empire consisting of leaves rolled around a filling based on minced meat and rice, which are then stewed or baked in the oven);
- a regular and very widespread consumption of teas made with the dried aerial parts of *Stachys thymphaea* (synonym: *Stachys reinertii* Heldr. ex Murb.), which is a species

Table 1 Food, medicinal and ritual uses of local plants recorded in the study area.

Scientific Name	Local Name(s)	CS ^a	PU ^b	UC ^c	Preparation and Use ^d
ADOXACEAE					
<i>Sambucus ebulus</i> L.	<i>kingjla</i>	W	Fr	MF	Fermented 1 week and distilled into <i>raki</i> : digestive problems.
			L	M; V	Crushed and applied: bruises and wounds in animals and humans. ^{MU}
<i>Sambucus nigra</i> L.	<i>shtog</i>	W	Fl	M ⁺	Tea (rare): antitussive. Dried and sold. ^{MU}
			Ba	M	Decoction mixed with sheep fat or bee wax to create poultice: burns and wounds.
ARALIACEAE					
<i>Hedera helix</i> L.	<i>urth</i>	W	AP	R	Ritual use: Spring festival.
ASTERACEAE					
<i>Achillea millefolium</i> L.	<i>lule bardhë, lule xhize</i>	W	FAP ⁺	V	Tea: diarrhea in young calves. Dried and sold.
<i>Arctium lappa</i> L.	<i>llapusha, rrënjë</i>	W	R ⁺		Dried and sold.
<i>Artemisia absinthium</i> L.	<i>pelin, pelin i bardhë</i>	W	AP	MF; V	Tea: cardiogenic and appetite stimulant. Decoction: fed to (ruminant) livestock for rumination problems; mixed with honey for wound healing.
<i>Calendula arvensis</i> (Vaill.) L.	<i>kamomil e kuqe, kamomil e verdhë</i>	W	FAP ⁺	V	Tea: given to livestock to drink for bacterial infections. Dried and sold.
<i>Carlina acanthifolia</i> All.	<i>kulaç ferrë</i>	W	FRe	F	Consumed raw as snack. ^{MU}
<i>Carlina acaulis</i> L. s.l. and <i>C. vulgaris</i> L.	<i>ferra gomari</i>	W	FRe	F	Consumed raw as snack. Informants recall that Italians consumed these raw in salads during WWII.
<i>Matricaria recutita</i> L.	<i>kamomil</i>	W	FT	M	Tea: stomachache, sedative (for insomnia), and pediatric diarrhea. ^{MU}
<i>Tanacetum vulgare</i> L.	<i>pelin i verdhë</i>	W	AP ⁺	M	Tea: stomachache. Dried and sold. ^{MU}
<i>Taraxacum officinale</i> Weber s.l.	<i>qumështorja, lule qeni</i>	W	YAP	F	Consumed raw in salad or boiled (rare practice, adopted from Greek migrants). ^{MU}
			L	M	Tea: hepatoprotective (rare), anti-hypertensive, and diuretic (rare).
			R ⁺		Dried and sold.
<i>Tussilago farfara</i> L.	<i>thundër mushka</i>	W	L ⁺ ; F ⁺		Dried and sold.
AMARANTHACEAE					
<i>Atriplex hortensis</i> L.	<i>labodë, laboda e butë</i>	SD	L	F	Most appreciated filling in home-made savory pies (<i>peta</i>), esp. in past. ^{MU}
<i>Chenopodium bonus-henricus</i> L.	<i>qiven</i>	W	R ⁺	F	Past ingredient for making hallva (dessert based on flour, butter, and sugar). Dried and sold. ^{MU}
AMARYLLIDACEAE					
<i>Allium cepa</i> L.	<i>qepë</i>	C	Bu	F; M	<i>Peta</i> filling. Crushed and mixed with <i>raki</i> (alcoholic fruit distillate) to make poultice: applied for back pains or, mixed with salt, for bruises and wounds. Cut into small pieces and macerated in cold water for 1 day: drunk for prostatitis. Fresh sliced bulb applied: eye inflammations. ^{MU}
			L	F	Raw: in salads or as <i>peta</i> filling. Dried and kept for winter.
<i>Allium porrum</i> L.	<i>presh</i>	C	AP	F	<i>Peta</i> filling. ^{MU}
			J; L	M	Fresh juice or tea of leaves instilled into ear (sometimes with vegetable oil): earache. ^{MU}
<i>Allium sativum</i> L.	<i>hudhëra</i>	C	Bu	F; M; MF; V	Used in food; pickled with various lacto-fermented vegetables; anti-hypertensive. Mixed with salt and rubbed on animal skin: antipruritic. Juice of bulb instilled: earache. Minced and fried in butter: eat for sore throat. ^{MU}

(-To be continued-)

Table 1 Food, medicinal and ritual uses of local plants recorded in the study area. (-Continued-)

Scientific Name	Local Name(s)	CS ^a	PU ^b	UC ^c	Preparation and Use ^d
APIACEAE					
<i>Bunium alpinum</i> Waldst. & Kit.	<i>hureshka</i>	W	T	F	Collected in the spring and eaten as snack, especially in the past and by young people.
Araceae					
<i>Arum maculatum</i> L.	<i>këllkazë</i>	W	AP	R	Ritual use: Spring festival.
ASPLENIACEAE					
<i>Asplenium trichomanes</i> L.	<i>fier i egër</i>	W	AP; R	M	Dried and used in decoctions for treating kidney problems (1/2 cup drunk per day).
BETULACEAE					
<i>Corylus avellana</i> L.	<i>lejthi</i>	W	Ke	F; M	Consumed raw or dried. Sometimes eaten: headaches. ^{MU}
			Br		
			Se [‡]		Sold. ^{MU}
BRASSICACEAE					
<i>Brassica oleracea</i> L.	<i>lakna</i>	C	L	F; M	Sarma ingredient; pickled with salt/lacto-fermented for the winter: food. Fresh leaf burned: inserted into the ear for earache. ^{MU}
COLCHICACEAE					
<i>Colchicum autumnale</i> L.	<i>kalqikum</i>	W	Fr [‡]		Dried and sold. ^{MU}
CORNACEAE					
<i>Cornus mas</i> L.	<i>thona</i>	W	Fr	F; MF	Eaten raw or, more often, dried, boiled: winter food (ashaf), diarrhea or stomachache. Preserves or syrups: health beverage and stomachache. Fermented to vinegar: fever (topical application) or health beverage (mixed with sugar). Mixed with bran: livestock mastitis (topical application). Distilled to alcoholic raki: health beverage and cardi tonic (one small glass drunk daily). ^{MU}
			FSt	R	Ritual use: Spring festival.
CUCURBITACEAE					
<i>Cucumis sativus</i> L.	<i>kastravec</i>	C	Fr	F	Cooked or lacto-fermented in brine: Food. ^{MU}
CUPRESSACEAE					
<i>Juniperus communis</i> L.	<i>gëllina</i>	W	Fr [‡]		Sold. ^{MU}
DENNSTAEDTIACEAE					
<i>Pteridium aquilinum</i> (L.) Kuhn	<i>fir, fejr i butë</i>	W	L		Used to cover potatoes, which are stored outdoors in mounds during the winter.
ERICACEAE					
<i>Vaccinium myrtillus</i> L.	<i>qarsheja e egër</i>	W	Fr [‡]	F; MF	Eaten raw: snacks. Dried, tea: anemia and heart problems (rare). Sold. ^{MU}
			St	M	Tea: stomachache, diarrhea, and diuretic.
EUPHORBIACEAE					
<i>Euphorbia myrsinites</i> L.		W	La	M	Topically applied: acne.
FABACEAE					
<i>Medicago sativa</i> L.	<i>jonxha</i>	C	AP	M	Galactagogue for livestock (high-quality fodder).
<i>Phaseolus vulgaris</i> L.	<i>grosh</i>	W	Se	F	Cooked in diverse ways: staple food. ^{MU}
<i>Trifolium pratense</i> L.	<i>terfili i kuq, lule dele</i>	W	FAP [‡]		Dried and sold.
<i>Vicia ervilia</i> Willd.	<i>urof</i>	C	Se	V	Fodder for livestock (in the past).

(-To be continued-)

Table 1 Food, medicinal and ritual uses of local plants recorded in the study area. (-Continued-)

Scientific Name	Local Name(s)	CS ^a	PU ^b	UC ^c	Preparation and Use ^d
FAGACEAE					
<i>Quercus</i> spp.	<i>drurë, dushk</i>	W	Br	R	Ritual use: Spring festival. ^{MU}
GENTIANACEAE					
<i>Gentiana lutea</i> L.	<i>shtarrë</i>	W	R ⁺		Dried and sold. ^{MU}
HYPERICACEAE					
<i>Hypericum perforatum</i> L.	<i>çaj i verdhë, lule verdhë, kanriot, katriot</i>	W	FAP ⁺	M	Dried, tea: stomach and digestive disorders and (less common) sore throat and diuretic. Infusion (red in color, sometimes prepared together with <i>Origanum vulgare</i>): considered healthy for the circulation of blood and for anemia. Decoction: topically applied to skin inflammations. Dried and sold. ^{MU}
JUGLANDACEAE					
<i>Juglans regia</i> L.	<i>arra</i>	SD	Fr ⁺	M; MF	Conserves: stomachache. Boiled, resulting water: dye and hair strengthener (women). Preserved in honey or in conserve: healthy food for regulating thyroid function. Topical applications to animals with worms. ^{MU}
			Ke ⁺	F	Eaten raw, dried, or used for baking sweets for festival days. Traditionally fried together with onions and eaten as a side-dish for beans or meat. ^{MU}
			AP	R	Ritual use: burned during Spring festival.
			KeM	M	Decoction: sore throat and cough.
LAMIACEAE					
<i>Melissa officinalis</i> L.	<i>milc</i>	W	L	MF	Healthy tea. Seasoning plant in cuisine.
			Fl		Considered best honey plant.
<i>Mentha longifolia</i> (L.) Huds.	<i>lule menti</i>	W	AP	M	Tea: bronchitis.
<i>Origanum vulgare</i> L.	<i>çaj malit, çaj vendi, çaj fushe</i>	W	FAP ⁺	M; MF	Dried, tea: health beverage (regularly drunk), sore throat, cough, and flu/fever/headaches; bread dipped in sugar sweetened tea as health food (esp. in past). Very commonly sold. The term <i>çaj fushe</i> refers to varieties of <i>Origanum vulgare</i> that are smaller than the usual ones. ^{MU}
<i>Salvia verticillata</i> L.	<i>grunezhda, gruneshda, gumnezhda</i>	W	AP	M	Fresh, crushed, or the fresh: cicatrizant, wound healing (humans), snake bites and skin inflammations (animals).
<i>Stachys tymphaea</i> Hausskn.	<i>çaj bjeshke, çaj djeshke, çaj i egër, çaj fushe</i>	W	FAP ⁺	M	Dried, tea: panacea, colds and flu. Sold.
<i>Thymus pulegioides</i> L.	<i>lisna, lisën</i>	W	FAP	F	Dried and powdered, used as a food seasoning. ^{MU}
LILIACEAE					
<i>Lilium candidum</i> L.	<i>zambak i egër</i>	W	R ⁺		Dried and sold.
LYCOPERDACEAE					
<i>Bovista dermoxantha</i> Pers.	<i>fenë arushe</i>	W	OFB	M; V	Topically applied: wounds in humans and equines.
MALVACEAE					
<i>Malva sylvestris</i> L.	<i>mëllaka</i>	W	L; Fl	M	Tea: diuretic.
			Fr ⁺	MF	Dried and sold or consumed (considered healthy). ^{MU}
MELANTHIACEAE					
<i>Veratrum album</i> L.	<i>shtarrë e egër</i>	W	AP		Considered toxic for livestock (animals foam from the mouth upon consuming it fresh). ^{MU}

(-To be continued-)

Table 1 Food, medicinal and ritual uses of local plants recorded in the study area. (-Continued-)

Scientific Name	Local Name(s)	CS ^a	PU ^b	UC ^c	Preparation and Use ^d
ORCHIDACEAE					
<i>Orchis morio</i> L. and other <i>Orchis</i> spp.	<i>salep</i>	W	T ⁺	MF	Dried and sold. Ground, powder infused in water or milk and drunk; reconstituent; bread dipped in drink s health food. Powder also used in pancake mix (<i>pallaqinka</i>). ^{MU}
PARMELIACEAE					
<i>Evernia prunastri</i> (L.) Ach.	<i>myshk druri</i>	W	Th	R	Ritual use: Spring festival.
PLANTAGINACEAE					
<i>Plantago major</i> L.		W	St; Fr L ⁺	M	Tea: diuretic. ^{MU} Dried and sold.
POACEAE					
<i>Avena sativa</i> L.	<i>tërrshërë</i>	W	AP	V	Fodder for livestock (equines). Boiled: fodder for equines with respiratory diseases.
<i>Hordeum vulgare</i> L.	<i>elb</i>	C	FlFr Fr	F V	Used in past for baking bread. ^{MU} Boiled: resulting steam/vapors inhaled by equines with heart problems.
<i>Secale cereale</i> L.	<i>thekna</i>	C	Fr	M; V	Animal fodder. Cracked fruits (<i>bulgur</i>) eaten by diabetic persons. ^{MU}
			FlFr	F	Used in past (until the 1990's), mixed with maize flour and whey for baking sourdough bread: functional food for diabetics. ^{MU}
			Str		Used to cover and store potatoes in outdoor trenches during the winter.
<i>Triticum aestivum</i> L.	<i>grunë, grurë</i>	C	Fr FlFr	F F	Roasted, powdered, decoction made as a kind of coffee. Bread and noodle ingredient (<i>jufka</i>). ^{MU}
<i>Zea mays</i> L. (both white and yellow landraces)	<i>misër, kollomoq</i>	C	FlFr Fr Sti	F V M	Basic staple food, for baking bread or pies. In the past (until the 1990's), the most common bread was baked mixing whey with corn and rye flour. ^{MU} Fodder for animals. ^{MU} Tea: diuretic.
POLYGONACEAE					
<i>Rumex patientia</i> L.	<i>lëpçeta, lëçeta, liç eta</i>	W	L		Peta ingredient. Crushed and mixed with animal fat for wound healing. ^{MU}
PRIMULACEAE					
<i>Primula veris</i> L.	<i>lule verdhë, aguliçe, zgjerifet, zgjirifet, lulë qingji, lule deshi, lule dashi</i>	W	R ⁺ ; Fl ⁺		Dried and sold. ^{MU}
			YL	F	<i>Sarma</i> ingredient (<i>see Vitis labrusca</i>).
RANUNCULACEAE					
<i>Helleborus cyclophyllus</i> Boiss. and <i>H. odorus</i> Waldst. & Kit. ex Willd.	<i>kukrek, lule ditvere</i>	W	FSt	R	Ritual use: Spring festival.
			AP	M	Dried, powered, applied on tooth: toothache.
ROSACEAE					
<i>Crataegus monogyna</i> Jacq. and <i>C. pentagyna</i> Waldst. & Kit. ex Willd.	<i>murrizi, murrizi i egër (C. monogyna only), fllanushka</i>	W	Fr	F	Eaten as snack, but not in large amounts, otherwise causes headache. ^{MU}

(-To be continued-)

Table 1 Food, medicinal and ritual uses of local plants recorded in the study area. (-Continued-)

Scientific Name	Local Name(s)	CS ^a	PU ^b	UC ^c	Preparation and Use ^d
ROSACEAE					
			Fl [‡] ; L [‡]		Dried and sold. ^{MU}
<i>Cydonia oblonga</i> Mill.	<i>ftoi (ftua)</i>	C	Fr	F; M	Jam: food. Decoction: stomachache.
			Se	M	Cold macerate topically applied to eye inflammations.
			YL	F	Lightly boiled, and then used as a main ingredient in sarma (see <i>Vitis labrusca</i>).
<i>Fragaria vesca</i> L., <i>F. viridis</i> Duchesne, and <i>F. moscata</i> Duchesne	<i>lagoda</i>	W	Fr	F	Consumed raw or in jams. ^{MU}
<i>Malus domestica</i> Borkh.	<i>mollë</i>	C	Fr	F	Eaten raw, in jams, or sliced and dried (<i>ashaf</i>) and sold or consumed in winter after boiling. Fermented and distilled in raki (rarely). ^{MU}
<i>Malus sylvestris</i> (L.) Mill.	<i>mollë e thartë</i>	W	Fr [‡]	MF	Dried (<i>ashaf</i>) and sold or consumed in winter after boiling them; considered healthy for persons affected by diabetes.
<i>Prunus cerasus</i> L.	<i>qershia</i>	W	FrP	M	Tea: diuretic (rare).
<i>Prunus domestica</i> L. and <i>P. cerasifera</i> Ehrh.	<i>kumbull, kumbull e egër, kumbull e vendit</i>	SD	Fr	F; M; MF	Eaten raw or in jams; or mixed with hot water: health beverage; or dried (<i>ashaf</i>). Fermented and distilled (<i>raki</i>), drunk for sore throat; mixed with milk: applied to forehead or chest for fever. Topically applied: wounds in animals. ^{MU}
<i>Prunus spinosa</i> L.	<i>kolumraia, kolumria, kulumreja</i>	W	Fr	MF	Gathered after the first frosts and consumed as a healthy snack.
			Fl [‡]		Dried and sold.
<i>Pyrus pyraster</i> (L.) Burgsd.	<i>dardhë e egër, dardhë gorrice</i>		Ba	M	Collected from young branches, dried, decoction: 1/2 cup of decoction drunk (cold) every morning with sugar: prostatitis.
			Fr	M	Eaten raw or in teas: diuretic.
<i>Rosa canina</i> L. s.l.	<i>kaçë</i>	W	Fr [‡]	M	Dried, tea: sore throat, flu, and diuretic. Sometimes sold. Fresh fruits fermented to make home-made vinegar: health food, topical application for fever, fed to animals for unspecified diseases. ^{MU}
			Fl		Decoction used as a dye.
<i>Rubus idaeus</i> L.	<i>malinka</i>	W	Fr	F	Eaten raw (reputed to cause headache if too many are eaten). ^{MU}
			L [‡]		Dried and sold.
<i>Rubus ulmifolius</i> Schott s.l.	<i>kulamana</i>	W	Fr	F	Raw or in jams: Food fermented to make raki (rare). ^{MU}
			L	M	Crushed and mixed with clarified butter (<i>tëlynë</i>), topically applied to skin infections and wounds.
			Fl [‡]		Dried and sold.
SALICACEAE					
<i>Salix purpurea</i> L.	<i>shenje</i>	W	Br	V	Fresh, young, woody piece inserted into mouth of animals: rumination problems (bloating) or poisoning from eating fresh <i>Veratrum</i> leaves. Tea: fed to <i>Veratrum</i> poisoned animals.
SOLANACEAE					
<i>Capsicum annuum</i> L.	<i>speca</i>	C	Fr	F	Cooked or pickled with salt/lacto-fermented for the winter, or pickled in yogurt ricotta (<i>xhiza</i>) (especially hot varieties): food. ^{MU}

(-To be continued-)

Table 1 Food, medicinal and ritual uses of local plants recorded in the study area. (-Continued-)

Scientific Name	Local Name(s)	CS ^a	PU ^b	UC ^c	Preparation and Use ^d
SOLANACEAE					
<i>Lycopersicon esculentum</i> Mill.	<i>domate</i>	C	Fr	F	Food. ^{MU}
			UFR	F	Pickled via lacto-fermentation (<i>turrshi</i>).
<i>Solanum tuberosum</i> L.	<i>kompira</i>	C	T [*]	F	Boiled, consumed; staple food in the past, together with corn. Stored outdoors in mounds in the winter months and sold in the spring. ^{MU}
URTICACEAE					
<i>Urtica dioica</i> L.	<i>hitha, hejtha</i>	W	YAP	F	Peta ingredient or mixed with rice and eggs (<i>burania</i>); rarely used as wrapping for sarma. Minced and dried for later food use. ^{MU}
			L	M	Rubbed onto the skin to treat rheumatic pains. ^{MU}
			R [*]	M	Dried, decoction used in washes or drinks; rheumatism or diuretic. Most often, sold.
VIOLACEAE					
<i>Viola odorata</i> L.	<i>lulë manushaqe</i>	W	Fl [*]		Dried and sold.
VITACEAE					
<i>Vitis labrusca</i> L.	<i>rrush me erë</i>	C	Fr	F	Eaten raw, or processed to produce wine, vinegar, or distillate (<i>raki rrushit</i>).
			YL	F	Sarma ingredient: leaves are rolled around a filling usually based on minced meat and rice.
			YSh	M	Squeezed to extract juice that is topically applied to wounds as an antiseptic.
			Sa	M	Instilled: ear inflammations. Topically applied: wounds.
<i>Diverse tree taxa</i>		W	Wo	R	Wood is burned and the resulting charcoal is used in Evil-eye diagnosis and therapy. Warm charcoal applied to belly of ill equines to heat the heat. Ashes are boiled with water and applied to bruises.

Note: ^aCultivation Status (CS) - C: cultivated; SD: Semi-domesticated; W: wild.

^bPart(s) Used (PU) - AP: aerial parts; Ba: bark; Br: branches; Bu: bulb; FAP: flowering aerial parts; FSt: stem with flowers; Fl: flowers; FlFr: flour (obtained from fruits); Fr: fruits or pseudo-fruits; FrP: fruit peduncles; FRE: flower receptacle; FT: flowering tops; J: juice; Ke: kernels; KeM: kernel membrane; La: latex; L: leaves; OFB: old fruiting body; R: root; Sa: sap; Se: seeds; St: stems; Sti: stigma; Str: straw; T: tuber; Th: thallus; UFR: unripe fruits; YAP: young aerial parts; YL: young leaves; YSh: young shoots; Wo: wood. *: Indicates the plant parts that are collected, dried and sold.

^cUse Category (UC): F: food; M: medicinal; MF: medicinal food; R: ritual use; V: veterinary.

^dPreparation and Use: MU: Same local use also recorded on the Macedonian side.

whose phytochemistry and phytopharmacology is completely unknown;

- the external use of fresh leaves of *Salvia verticillata* on wounds and skin inflammations, whose potential antimicrobial activity has been recently pointed out (Yousefzadi et al. 2007); an external and internal use is however known also in the Bulgarian folk medicine (Georgiev 1999);

- the external use of *Bovista dermoxantha* for treating wounds in both humans and equines (similar uses have been found also in Kosovo [Avni Hajdari, unpublished results]);

- the domestic use of fruits of *Sambucus ebulus*, fermented (Figure 2) and distilled;

- vinegar made from *Cornus mas* fruits, both as a food and medicine – a similar use was also reported by elderly informants in a field study in Istria (Pieroni et al. 2003) and also in Bulgaria (Georgiev 1999).

2.2 Folk medicinal remedies for humans and livestock

In total, there were approx. 150 distinct remedies

(natural product to illness/purpose reports) of plant or other origin; approx. one-sixth of the quoted remedies were reported as being used for animal diseases. This relatively large number of remedies dedicated to ethnoveterinary medicine, focused on livestock and equines used for agricultural labor, highlights the importance of animals in the local economy. Of the remedies cited for human use, the majority (32) were dedicated to treatment of conditions of the skin (such as burns, wounds, infections, and inflammations), followed by therapies for complaints pertaining to the gastrointestinal (18), urogenital (17), musculoskeletal (15), and respiratory (14) systems (Figure 3). Ethnoveterinary remedies, on the other hand, focused mainly on ailments of the skin (10) and gastrointestinal system (10). Of particular interest was the focus on therapies to treat bloating in ruminant livestock.

2.3 Comparison of the medicinal plant reports from the Albanian and Macedonian sides of Mount Korab

The overlap between the medicinal uses of wild and semi-domesticated plants reported by Albanians on the Albanian and Macedonian (Pieroni 2013) sides of Mount Korab is illustrated in Figure 4. While approximately one-third of the medicinal plant reports are the same, a significant divergence for most of the other taxa is notable. According to the oldest informants in the study, the villages on both sides of the mountain were in regular contact up until the beginning of the Communist regime in 1945. As communities still share a common flora and assuming that they also shared a regular exchange of TEK (as is typical in communities with commonplace marital exchanges) prior to this point, the great change in current-day knowledge and practice concerning the local flora suggests that the cultural and political dynamic of the region over the past 60 years played a critical role in shifting phytotherapeutical trajectories. This would have been most relevant to the minority Albanians living on the Macedonian side of the mountain due to their exposure to the dominant Macedonian/Slav cultures.

2.4 Other folk medicinal remedies

Other folk remedies, based on animal products,



Figure 2 Fermented fruits of *Sambucus ebulus*, ready to be distilled in *raki*.

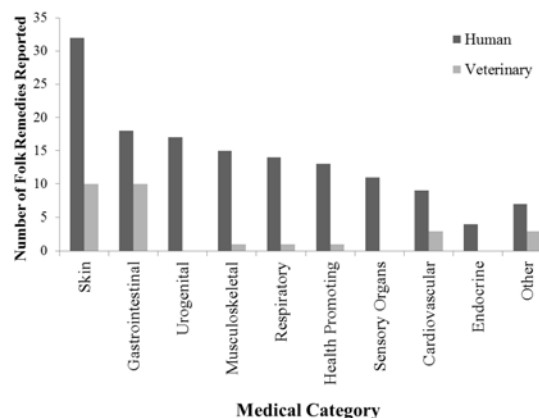
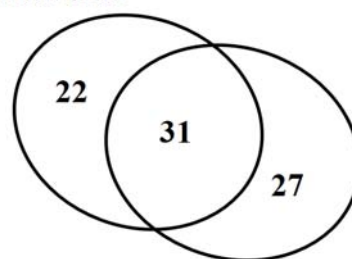


Figure 3 Number of recorded medical and veterinary remedies cited for each pathological category.

Albanian side



Macedonian side

Figure 4 Diagram representing the overlaps between the folk medicinal plant reports recorded on the Albanian and Macedonian side of Mount Korab.

minerals (or even industrial products diverted from their original use and plant-based remedies not coming from the local area, which are acquired from outside) are reported in Table 2. It is noteworthy to mention that when compared with other zootherapeutic reports from field studies in southern and southeastern Europe (Quave 2013), the practice of consuming partridge meat as a

means of treating rheumatism emerges as a unique commonality.

2.5 *Lule ditvere*: ritual uses of plants in the spring festival

As in other places in Europe in the past century (Bächtold-Stäubli 1927-1942; De Cleene

Table 2 Other folk medicinal remedies recorded in the study area (animal- or mineral-based; industrial products and non-local botanicals).

Remedy (scientific and local name)	Preparation and use
Beer	Beverage for cattle: rumination problems.
Buttermilk (<i>dhallë</i>)	Beverage for cattle: rumination problems. Used like rennet during the cheese making process.
Clarified butter (<i>tëlyen</i>)	Eaten: laxative.
Cobweb	Topically applied: cicatrizant (especially for equines).
Cow feces (<i>Bos taurus</i> Linnaeus)	Topically applied: burns.
Donkey (<i>Equus asinus</i> Linnaeus), horse (<i>Equus caballus</i> Linnaeus) and relative hybrids (mules) feces	Mixed with cold water, filtered, and macerate is instilled into ear: earache.
Eggs (from <i>Gallus gallus domesticus</i> Linnaeus)	Briefly fried (left partially raw) and topically applied: burns. Egg yolk, mixed with raw wool, topically applied: bruises and cicatrizant. Egg white, mixed with soap, topically applied to broken legs. Egg white, fried in butter and topically applied to eyes: conjunctivitis.
Goat milk	Beverage: laxative and for health.
Honey (from <i>Apis mellifera</i> Linnaeus)	Eaten: health food, anti-hypertensive and cardiogenic. Mixed with hot water: cough. Fermented in vinegar: health beverage. Topical application: burns.
Hare (<i>Lepus europaeus</i> Pallas) fat	Topical application: suppurative.
Hedgehog (<i>Erinaceus</i> Linnaeus sp.) (<i>iriq</i>) meat	Eaten: rheumatism.
Human (<i>Homo sapiens</i> Linnaeus) urine	Topical application: cicatrizant.
Human (<i>Homo sapiens</i> Linnaeus) milk	Topical application: eye and ear inflammations.
Leather powder (obtained by rubbing a man's belt)	Topical application: cicatrizant.
Milk (<i>qumësht</i>)	Beverage: post-partum reconstituent.
Paper	Paper is burned and the resulting smoke is directed to the ear cavity: ear inflammations.
Partridge (<i>Alectoris</i> Linnaeus sp.) (<i>thëllëza</i>) meat	Eaten: rheumatism.
Salt	Mixed with warm water and topically applied: bruises, muscular pains and rheumatism. Poison antidote food (for livestock poisoned by <i>Veratrum album</i>)
Soda (sodium bicarbonate)	Given to livestock to treat rumination problems. Topically applied to human burns.
Sugar	Mixed with water (syrup: sherbet) and given to horses affected by heart problems. Burned with butter: sore throat and cough.
Sulfur	Suspended in water, topically applied with a hen's feather: burns.
Tobacco (<i>Nicotiana tabacum</i> L.) (<i>duhan</i>)	Topical application: cicatrizant. Boiled in water, topical application: hoof and mouth disease (<i>Aphthae epizooticae</i>) in livestock.
Tin (<i>nishadër</i>)	Melted and inserted into the nose of the horse: cough.
Yogurt (<i>kos</i>)	Eaten: renal depurative.
Yogurt ricotta (<i>xhiza</i>)	Topical application: burns. Eaten (unsalted): diuretic.
Water	Massages, topical application: insect sting pain relief.
Whey (<i>hirra, heira, hejrra</i>)	Beverage: kidney stones, diuretic and digestive (humans); rumination problems (livestock). Bread ingredient.

2003; Tunón 2001-2005), the beginning of the spring/summer is celebrated by a very unique ceremony. On the afternoon/evening of March 12th, a bouquet (called *lule ditvere*, literally meaning “flower of the summer’s day”) is arranged with the aerial parts of *Helleborus* spp., *Hedera helix*, *Arum maculatum*, flowering *Cornus mas*, *Quercus* spp., *Corylus avellana*, and thallus of *Evernia prunastri*. The bouquet is placed on the kneading trough and churn for one day (March 13th). This practice is seen as a good omen for a prosperous food year. On March 14th, the bouquet is hung at the entrance of the house for the next several weeks until it falls down, and is then thrown into the closest river.

Another part of the same March 13th ceremony involves the distribution/gifting of boiled eggs to one another and that evening, children burn the aerial parts of *Juniperus communis*. This same ritual has been documented in other regions as well – for example in Kosovo (Sejdiu 1984) and in North-Western Tuscany on Christmas Eve (Pieroni 1999).

The main and irreplaceable components of the March 13th/14th festival ritual are the aerial parts of *Helleborus* spp., which is also locally referred to with the same name of the ritual and of the bouquet (*lule ditvere*) or simply *kukrek*, which is a folk name for *Helleborus* spp. that is widely used throughout the Balkans (Jarić et al. 2007; Mustafa et al. 2012a; Rexhepi et al. 2013). The folk name has been described to be a Turkish loan (Doda and Nopcsa 2007) and actually even shares a similar folk medicinal use as in the current study area (against toothache) in both Kosovo and Turkey (Kültür 2007; Mustafa et al. 2012a). A similar ritual use of *Helleborus* spp. and *Cornus mas* has been recorded in other parts of Albania (Tirta 2004), among Albanians in Macedonia (Sejdiu 1984), and in Kosovo (Sejdiu 1984), while in Bulgaria *Helleborus* (*kukurjak*) and *Salix* spp. are the main elements of the St. George’s Day feast (May 6th) (Marinov 2003; Vakarelski 1977).

However, *Cornus mas* twigs or small branches (called “Survachka” or “Survaknitsa”) are a symbol of fertility and prosperity in Bulgaria; they are used by children - decorated with strings of popcorn, dried fruit, bread rings - to tap people’s (their parents’, grandparents’ and friends’) backs when wishing them a Happy New Year and giving wishes for health, wealth and happiness in the traditional

Bulgarian New Year custom “survakane” (Nedelcheva 2011; Vakarelski 1977).

2.6 The legacy of communism: collecting wild medicinal plants

As observed in other mountainous areas in Albania (Pieroni 2008, 2010; Pieroni et al. 2005), the legacy of Communism can be traced in the traditions of gathering wild medicinal taxa for trade. This activity became widespread during the second phase of the Communist regime, when Albania fostered its isolation and self-sufficiency, after having broken the relations to the Soviet Union in 1961 and to China in 1976. The gathering of medicinal plants within the country became a crucial activity in many rural cooperatives, and especially in the mountainous areas around Peshkopia, for serving the national herbal-pharmaceutical markets.

Most of the wild-crafted plants were known by the local populations, but were not locally used, and neither had they been used in the past. They were, in other words, simply goods, mainly detached from the cultural heritage of the local people. Still nowadays, in all of the villages we visited, an impressive number of medicinal plants (approx. 30) represent a source of important income for many families (Table 1). Among these, especially *Gentiana lutea*, *Primula veris*, *Urtica dioica*, *Crataegus* spp., *Thymus pulegioides*, *Hypericum perforatum*, *Vaccinium myrtillus*, *Juniperus communis*, *Achillea millefolium*, *Orchis* spp., and *Sambucus nigra* represent the most frequently gathered; they are dried in the village courtyards and then traded to middle men in Peshkopia and Tirana, both for the internal herbal and German phytopharmaceutical markets.

Most of these taxa, however, are not actually used in the same village, and their potential utilization is even ignored. This is likely due to the fact that a direct experience of using these plants never took place as their utility has been restricted solely to trade for decades; we observed a similar pattern in a field study conducted in Theth, in northern Albania (Pieroni 2008), but to a lesser extent.

On the other hand, locals who have recently migrated back to their Albanian villages around Peshkopia after spending a couple of decades in Greece for work, reported experience with certain

wild food herbs during their time abroad, and have consequentially brought TK of these practices home with them. An example of this is the use of young aerial parts of *Taraxacum officinale*, which they have now integrated into their local cuisine. Thus, the direct experience of using botanicals while abroad permitted ethnobotanical changes and innovations among the local population with the existing local flora. This clearly demonstrates the importance of the practical/active knowledge of a plant (and not simply gathering activities) for introducing novelties in the local plant-based bio-cultural heritage.

2.7 Gathering, but not using: a weakened form of local knowledge?

Some notable ecological concerns may arise from this practice of harvesting specific taxa from the wild. Since a significant portion of the wild medicinal plants is only gathered for trade (especially over the past three decades), it means that these resources escape from the local system, and locals may not be concerned about the sustainability of their practices. More specifically, the fact that the ecological availability of these plants is not connected to their actual domestic use may facilitate their overexploitation. Study participants confirmed that nowadays they gather most of the medicinal plants for trade even illegally on the Macedonian side of Mount Korab, since a few of the most overexploited taxa (especially *Gentiana* and *Orchis* spp.) are not available on their side anymore.

The need to manage the availability/renewability of natural resources by a local population may only be apparent when the remaining resources are still clearly visible within the local system and can still be perceived as part of the *commons*; only in this way can a strategy for building resilience in a local management system be implemented (Berkes 2003).

Local knowledge systems are, in fact, complex socio-cultural products consisting of highly contextualized knowledge, practices/skills, and beliefs (Antweiler 1998; Cocks 2006; Eira et al. 2013), and they represent the results of a long co-evolution of the local people with their surroundings – i.e. local people constantly reading their environment, assembling large amounts of information, and designing collective

mental models able to both adjust to new information (Berkes and Berkes 2009) and transmit it to the next generations.

Wild medicinal plants represent a good example of common pool resources (CPRs) (Ostrom 1994). If in many cases trade could have an overexploiting effect on CPRs (Galinato 2011), the crucial question is the strategy of management of the CPRs. The depletion of the stock of wild medicinal plants due to unsustainable flow driven by trade could have three possible solutions. The first is learning from the past could be the first step to improve the strategy of management, what is called “heuristic strategy” (Ostrom et al. 1994), always in the framework of a non-cooperative strategy. The second possible institution is the intervention of an external regulator with the introduction of limitations, taxes, and the assignment of particular rights. Finally, the third possibility is the cooperative management of the stock of wild plants: the plant gatherers should base their decision not on individual rationality but on group rationality to minimize the externality of depletion (Madani and Dinar 2012). This last possibility is, however, not very easy to implement in the study area due to local perceptions of cooperative work, which is still closely associated to the Communist past.

Local appreciation for the sustainable use of natural resources is then a crucial issue in their management and conservation, especially when faced with external demands to quench market pressures. Regulatory requirements in such cases could be as indispensable as community-based educational programs aimed at reconnecting local populations with the idea of limitations of these resources. On the other hand, conservation knowledge can develop through a combination of ecological understanding and learning from crisis and mistakes (Berkes and Turner 2006).

3 Conclusions

Local environmental resources derived from plants and animals continue to play an important role in the provision of folk medical care for both humans and their livestock in the mountainous Albanian communities of Mount Korab. However, as a remnant of the Communist period of collecting to supply the nation with medicinal herbs, in addition to those taxa used for local healthcare and

ritual means, a significant portion of the collected wild flora is used solely for the purpose of trade. Specifically, these particular flora are not tied to the cultural heritage of the local population, and thus are not subject to the same level of concern regarding sustainable use as those collected specifically for household healthcare needs.

Based on these findings, the sustainability of the current wild harvesting practices for trade requires substantial review – especially with regards to *Orchis* spp. and *Gentiana* spp., whose populations have already been severely depleted on the Albanian side of Mount Korab. Cooperative programs for sustainable rural development,

mainly led by international non-governmental organizations (NGOs) in this area, should consider this dilemma carefully, and perhaps redirect gathering activities to those medicinal plants requested by the market that also share strong cultural ties to the local population.

Acknowledgments

Special thanks are due to all informants, who generously shared their knowledge regarding local plants and especially to Hajredin Ferataj, Prishtinë, Republic of Kosovo, for the simultaneous interpretations.

References

- AAA/American Anthropological Association (2012) Statement on Ethics: Principles of Professional Responsibility. Available online: http://www.aaanet.org/coe/Code_of_Ethics.pdf (Accessed on 20 May 2013).
- Antweiler C (1998) Local knowledge and local knowing: An anthropological analysis of contested “cultural products” in the context of development. *Anthropos* 93: 469-494.
- Bächtold-Stäubli H, Hoffmann-Krayer E (1927-1942) Dictionary of German superstitions. Walter de Gruyter, Berlin, Germany. (In German).
- Berkes F, Berkes MK (2009) Ecological complexity, fuzzy logic, and holism in indigenous knowledge. *Futures* 41: 6-12. DOI: 10.1016/j.futures.2008.07.003.
- Berkes F, Colding J, Folke C (2003) *Navigating Social-Ecological Systems: Building Resilience for Complexity and Change*. Cambridge University Press, Cambridge, UK.
- Berkes F, Turner, NJ (2006) Knowledge, learning and the evolution of conservation practice for social-ecological system resilience. *Human Ecology* 34: 479-494. DOI: 10.1007/s10745-006-9008-2.
- Brussell DE (2004) Medicinal plants of Mt. Pelion, Greece. *Economic Botany* 58: S174-S202.
- Cocks M (2006) Biocultural diversity: Moving beyond the realm of ‘indigenous’ and ‘local’ people. *Human Ecology* 34: 185-200.
- Cozzi E (1909) Disease, death, funerals in the mountains of Albania. *Anthropos* 4: 903-918. (In Italian).
- Cozzi E (1914) Beliefs and superstitions in the mountains of Albania. *Anthropos* 9: 449-476. (In Italian).
- De Cleene M, Lejeune MC (2003) *Compendium of symbolic and ritual plants in Europe*. Man & Culture Publ., Ghent, Belgium.
- Doda BE, Nopcsa F (2007) Albanian peasant life in the upper Reka Valley, Dibra (Macedonia). LIT, Vienna, Austria. (In German).
- Dogan Y, Nedelcheva AM, Obratov-Petković D, Padure IM (2008) Plants used in traditional handicrafts in several Balkan countries. *Indian Journal of Traditional Knowledge* 7: 157-161.
- Durham E (1923) Some Balkan remedies for diseases. *Man* 23: 131-135.
- Eira IMG, Jaedicke C, Magga OH, et al. (2013) Traditional Sámi snow terminology and physical snow classification—Two ways of knowing. *Cold Regions Science and Technology* 85: 117-130. DOI: 10.1016/j.coldregions.2012.09.004.
- Galinato GI (2011) Endogenous property rights regimes, common-pool resources and trade. *Ecological Economics* 70: 951-962. DOI: 10.1016/j.ecolecon.2010.12.011.
- Georgiev M (1999) *Bulgarian Folk Medicine*. Petar Beron Publishing House, Sofia, Bulgaria. (In Bulgarian).
- Hafellner J (2012) Checklist of lichens and lichenicolous fungi of Albania. Available online: http://www.biologie.uni-hamburg.de/checklists/europe/albania_1.htm (Accessed on 20 May 2013).
- Jarić S, Popović Z, Mačukanović-Jocić M, et al. (2007) An ethnobotanical study on the usage of wild medicinal herbs from Kopaonik Mountain (Central Serbia). *Journal of Ethnopharmacology* 111: 160-175. DOI: 10.1016/j.jep.2006.11.007.
- Kathe WS, Honnef S, Heym A (2003) Medicinal and aromatic plants in Albania, Bosnia-Herzegovina, Bulgaria, Croatia and Romania. BfN, Bonn, Germany.
- Kołodziejska-Degórska I (2012) Mental herbals - A context-sensitive way of looking at local ethnobotanical knowledge: Examples from Bukovina (Romania). *Trames* 16: 287-301. DOI: 10.3176/tr.2012.3.04.
- Kültür S (2007) Medicinal plants used in Kiklarelí Province (Turkey). *Journal of Ethnopharmacology* 111: 341-364.
- Kültür S, Sami SN (2009) Medicinal plants used in Ispirih (Razgrad-Bulgaria) district. *Turkish Journal of Pharmaceutical Sciences* 6: 107-124.
- Londoño PT, Doka D, Becker H (2008) Collection of medicinal and aromatic plants in Albania - An analysis given by examples of the surroundings of Peshkopi (Dibër region). *Zeitschrift für Arznei- und Gewürzpflanzen* 13: 153-160.
- Madani K, Dinar A (2012) Non-cooperative institutions for sustainable common pool resources management: An application to groundwater. *Ecological Economics* 74: 34-45. DOI: 10.1016/j.ecolecon.2011.12.006.
- Marinov D (2003) Selected works. 1.2 Religious folk customs. Iztok-Zapad, Sofia, Bulgaria. (In Bulgarian).
- Matevski V (2010) Important plant species in the Mavrovo National Park. Available online: <http://www.oxfamitalia.org/wp-content/uploads/2010/12/30-1-2010-final-angliski-V-MATEVSKI-MAVROVO-FLORA.pdf> (accessed 20 May 2013).
- Menković N, Šavikin K, Tasić S, et al. (2011) Ethnobotanical study on traditional uses of wild medicinal plants in Prokletije Mountains (Montenegro). *Journal of Ethnopharmacology* 133: 97-107. DOI: 10.1016/j.jep.2010.09.008.
- Mustafa B, Hajdari A, Krasniqi F, et al. (2012a) Medical ethnobotany of the Albanian Alps in Kosovo. *Journal of Ethnobiology and Ethnomedicine* 8: 6. DOI: 10.1186/1746-4269-8-6.
- Mustafa B, Hajdari A, Pajazita Q, et al. (2012b) An ethnobotanical survey of the Gollak region, Kosovo. *Genetic Resources and Crop Evolution* 59: 739-754. DOI: 10.1007/s10722-011-9715-4.
- Nedelcheva A, Dogan Y (2009) Folk botanical nomenclature and classification in Bulgarian traditional knowledge. In Morel JP, Mercuri AM (Eds.): *Plants and Culture: seeds of the*

- cultural heritage of Europe. Edipuglia, Bari, Italy. pp 169-173.
- Nedelcheva A, Dogan Y (2011) Usage of plants for weather and climate forecasting in Bulgarian folk traditions. *Indian Journal of Traditional Knowledge* 10: 91-95.
- Nedelcheva A, Dogan Y, Obratov-Petkovic D, et al. (2011) The traditional use of plants for handicrafts in southeastern Europe. *Human Ecology* 39: 813-828.
- Nedelcheva AM, Dogan Y, Guarrera PM (2007) Plants traditionally used to make brooms in several European countries. *Journal of Ethnobiology and Ethnomedicine* 3: 20. DOI: 10.1186/1746-4269-3-20.
- Ostrom E, Gardner R, Walker J (1994). *Rules, Games and Common Pool Resources*. University of Michigan Press, Ann Arbor, USA.
- Paparisto K, Demiri M, Mitrushi I, et al. (1988-2000) *Albanian Flora*. Tirana: Akademia e Shkencave e RPS te Shqipe rise, Qendra e Ke rkimeve Biologjike. (In Albanian)
- Papp N, Bartha S, Boris G, et al. (2011) Traditional uses of medicinal plants for respiratory diseases in Transylvania. *Natural Product Communications* 6: 1459-1460.
- Papp N, Birkás-Frendl K, Farkas A, et al. (2013) An ethnobotanical study on home gardens in a Transylvanian Hungarian Csángó village (Romania). *Genetic Resources and Crop Evolution* 60: 1423-1432. DOI: 10.1007/s10722-012-9930-7.
- Pieroni A (1999) Wild plants and collective imaginary in Alta Garfagnana (Lucca): a documentation center on oral culture. *Informatore Botanico Italiano* 31: 183-189. (In Italian)
- Pieroni A (2008) Local plant resources in the ethnobotany of Theth, a village in the Northern Albanian Alps. *Genetic Resources and Crop Evolution* 55: 1197-1214. DOI: 10.1007/s10722-008-9320-3.
- Pieroni A (2010) People and plants in Lëpushë. Traditional medicine, local foods, and post-communism in a North Albanian village. In: Pardo de Santayana M, Pieroni A, Puri R (Eds.), *Ethnobotany in the New Europe: People, Health and Wild Plant Resources*. Berghahn, New York/Oxford. pp 16-50.
- Pieroni A, Dibra B, Grishaj G, et al. (2005) Traditional phytotherapy of the Albanians of Lepushe, Northern Albanian Alps. *Fitoterapia* 76: 379-399. DOI: 10.1016/j.fitote.2005.03.015.
- Pieroni A, Giusti ME, Münz H, et al. (2003) Ethnobotanical knowledge of the Istro-Romanians of Žejane in Croatia. *Fitoterapia* 74: 710-719. DOI: 10.1016/j.fitote.2003.06.002.
- Pieroni A, Giusti ME, Quave CL (2011) Cross-Cultural Ethnobiology in the Western Balkans: Medical Ethnobotany and Ethnozoology Among Albanians and Serbs in the Pešter Plateau, Sandžak, South-Western Serbia. *Human Ecology* 39: 333-349. DOI: 10.1007/s10745-011-9401-3.
- Pieroni A, Quave CL, Giusti ME, et al. (2012) "We are Italians!": The hybrid ethnobotany of a Venetian diaspora in Eastern Romania. *Human Ecology* 40:435-451. DOI: 10.1007/s10745-012-9493-4.
- Pieroni A, Rexhepi B, Nedelcheva A, et al. (2013) One century later: the folk botanical knowledge of the last remaining Albanians of the upper Reka Valley, Mount Korab, Western Macedonia. *Journal of Ethnobiology and Ethnomedicine* 9: 22. DOI: 10.1186/1746-4269-9-22.
- Quave CL, Pieroni A (2013) Mediterranean zootherapy: A historical to modern perspective. In: Alves RRN, Lucena RI (Eds.), *Animals in Traditional Folk Medicine*. Springer, New York, USA. pp 303-316.
- Redzic S (2007) The ecological approach to ethnobotany and ethnopharmacology of population in Bosnia and Herzegovina. *Collegium Anropologicum* 31: 869-890.
- Redzic S (2010a) Wild medicinal plants and their usage in traditional human therapy (Southern Bosnia and Herzegovina, W. Balkan). *Journal of Medicinal Plant Research* 4: 1003-1027.
- Redzic S (2010b) Wild Mushrooms and Lichens used as Human Food for Survival in War Conditions; Podrinje - Zepa Region (Bosnia and Herzegovina, W. Balkan). *Research in Human Ecology* 17: 175-187.
- Redžić S (2006) Wild edible plants and their traditional use in the human nutrition in Bosnia and Herzegovina. *Ecology of Food and Nutrition* 45: 189-232.
- Rexhepi B, Mustafa B, Hajdari A, et al. (2013) Traditional medicinal plant knowledge among Albanians, Macedonians and Gorani in the Sharr Mountains (Republic of Macedonia). *Genetic Resources and Crop Evolution* 60:2055-2080. DOI: 10.1007/s10722-013-9974-3. (In press)
- Šarić-Kundalić B, Dobeš C, Klatte-Asselmeyer V, et al. (2010) Ethnobotanical study on medicinal use of wild and cultivated plants in middle, south and west Bosnia and Herzegovina. *Journal of Ethnopharmacology* 131: 33-55. DOI: 10.1016/j.jep.2010.05.061.
- Šarić-Kundalić B, Dobeš C, Klatte-Asselmeyer V, et al. (2011) Ethnobotanical survey of traditionally used plants in human therapy of east, north and north-east Bosnia and Herzegovina. *Journal of Ethnopharmacology* 133: 1051-1076. DOI: 10.1016/j.jep.2010.11.033.
- Savikin K, Zdunic G, Menkovic N, et al. (2013) Ethnobotanical study on traditional use of medicinal plants in South-Western Serbia, Zlatibor district. *Journal of Ethnopharmacology* 146: 803-810. DOI: 10.1016/j.jep.2013.02.006.
- Sejdiu S (1984) Glossary of the Albanian ethnobotany. Prishtina: Rilindja. (In Albanian).
- Sökand R, Kalle R (2010) Herbal landscape: The perception of landscape as a source of medicinal plants. *Trames* 14: 207-226. DOI: 10.3176/tr.2010.3.01.
- Stevens PF (2012) *Angiosperm Phylogeny Website*. Available online: <http://www.mobot.org/MOBOT/research/APweb/> (accessed 20 May 2013).
- Tirta M (2004) *Albanian mythology*. Akademia e Shkencave të Shqipërisë, Tirana, Albania. (In Albanian).
- Tunón H, Emanuelsson U (2001-2005) *Etnobiologi i Sverige 2. Människan och floran*. Stockholm: Wahlström & Widstrand.
- Tutin TG, Heywood VH, Burges NA, et al. (1964-1980) *Flora Europaea*. Cambridge University Press, Cambridge, UK.
- Vakarelski K (1977) *Ethnography of Bulgaria*. Izd. Nauka i Izkustvo, Sofia, Bulgaria. (In Bulgarian).
- Yousefzadi MA, Sonboli A, Karimic F, et al. (2007) Antimicrobial activity of some *Salvia* species essential oils from Iran. *Zeitung für Naturforschung C* 62: 514-518.