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ORIGINAL RESEARCH PAPER

Folk food and medicinal botanical knowledge among the last remaining Yörüks of the Balkans

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Abstract

The present study examines the current lifestyle of the last remaining Balkan Yörüks, a small and isolated group found within the Republic of Macedonia, and the modern representatives of an important portion of the Balkan nomads. The aim of this study was to document knowledge concerning local wild food plants and wild and cultivated medicinal plants, and to compare the Yörük ethnobotany with that of similar, more or less isolated ethnic groups occurring in the Balkan region (Macedonia, Bulgaria, Albania, and Turkey) in order to assess how cultural adaptation processes may have affected Yörük plant folklore. We conducted this study by means of detailed, semi-structured interviews with 48 key informants.

Sixty-seven plant taxa were recorded from 55 genera, based on the compilation of more than 150 reports relating to medicinal, food, forage, ornamental, and dye plants, as well as some elements relating to animals and minerals. Our field study data show several major ethnic boundary markers that contribute to the homogeneity of the community and also distinguish it sufficiently from the surrounding society: *(i)* well-isolated locality; *(ii)* local dialect and endogamy; *(iii)* casual clothing worn by women; *(iv)* ceremonial jewelry: a necklace of cloves (*Syzygium aromaticum*); *(v)* *Sempervivum marmoreum* as an only ornamental plant which also has a medicinal use; and *(vi)* *Mentha spicata* as the dominant culinary herb, which has a medicinal use too. Comparison of the collected ethnobotanical data with that of similar, more or less isolated ethnic groups in the Balkan region shows that overlapping taxa include mainly plants whose fresh fruit are used; both nuts as well as edible greens. These plants are simultaneously used for medicinal purposes too, as home remedies, but in very different ways to other ethnic groups.

Yörüks represent a remarkable cultural group in the Balkans. This community has nomadic traditions, but nowadays the people have a settled lifestyle. Traditional knowledge remains strong and is retained within a well-defined cultural boundary.

Keywords

ethnobiology; ethnobotany; Macedonia; Plačkovica Mountain; Yörüks

Introduction

During the past decade, the Balkans have been the focus of a number of ethnobotanical studies that have revealed the complex relationships of humans and plants at the location of a geographical crossroads where the complex features of their history and the structure of their ethnicity and religion meet. Most of the previous studies were mainly aimed at medicinal and edible plants and traditional handicrafts [1–15] and shed new light on existing ethnological and anthropological data. Some studies

investigated small ethnic groups living in more or less isolated communities and provided new and very important data about the characteristics, storage, and transfer of the region's traditional knowledge [6,11–22]. These not only addressed the specific features of the region, but also contributed to the understanding of complex historical and social processes that by far exceed the limitations of the mechanical documentation of botanical data. The multicultural environment of the Balkans is one of the few surviving sources of stored vital bio-cultural heritage to be found in Europe. Our present period of history may be the last opportunity for scientists to document and analyze that knowledge.

Based on this scientific premise, the present study attempts to investigate the lifestyle of Yörüks living in southeastern Macedonia, who represents the last remaining Balkan Yörüks alive today – a small and isolated group dwelling within the Republic of Macedonia. They are the modern representatives of a historical phenomenon, namely, the Balkan nomads.

The most probable etymology for the name “Yörük” or “Yürük” is from the Turkic *yorımek*, *yörümek*, and *yürümek* – which means “walking”, “skiing”, and “nomad”.

For centuries, Yörüks represented a significant community which, nevertheless, was smaller in number than the surrounding “settled” peoples of the Ottoman Balkans. This community formed the basis of the nomadic tribes of Asia Minor and became established in Southeastern Europe during and following the fifteenth- and sixteenth-century Ottoman conquest (Yörük mass colonization). A long-term consequence of this, extending throughout the Ottoman period until the first two decades of the twentieth century (1912–1923), was the establishment of numerous, densely populated areas, the so-called “Yörükklüsi”. Of these, only the “Yörükklük” remains today in Macedonia, located at the center of an area occupied by the Plačkovica Mountain, Štip, Radoviš, Valandovo, and Dojran [23]. The most probable period of mass settlement of Yörüks in Macedonia was during the first half of the sixteenth century, and they were attracted to the area by the favorable natural conditions and the availability of uncultivated land [23,24]. Asia Minor Yörüks had long been the subject of scientific research, and also the classic subject of Turkic and Ottoman studies. Research projects into their cultural traditions and folklore are numerous and comprise mainly ethnographical, descriptive texts and sets of anthropological data, while conversely, ethnobotanical studies have been entirely neglected.

The aim of this study was to document plant knowledge relating to local wild food and wild and cultivated medicinal plants among the Yörüks of Macedonia and to compare the ethnobotany with that of similar, more or less isolated ethnic groups occurring the Balkan region (Macedonia, Bulgaria, Albania, and Turkey) in order to assess how cultural adaptation processes, which the Yörük minority have only experienced during the past few centuries, may have impacted on their plant folklore. Moreover, we also wanted to analyze the eventual occurrence and use of local plants and food items as cultural markers for the investigated communities.

Material and methods

The current study was conducted in nine villages in southeastern Macedonia, which extends along the base of Plačkovica Mountain and the northern part of the Radoviš–Strumica valley: Karbinci Municipality (20 000 inhabitants) [25]; Kalauzliya (61 inhabitants); Kepekčeliya (9); Prnaliya (197); Kučica (119) [26]; Radoviš Municipality (98 000 inhabitants) [22]; Ali Koč (328); Kodzalija (478); Kalauzliya (279) [26]; Vasilevo Municipality (76 000 inhabitants); [22]; and Visoka Maala (497) [26] (Tab. 1). These villages are located off the main transport routes, separated and structured by small hamlets (Fig. 1). The population is comprised exclusively of Yörüks, and since they are Muslim, their settlements each have at least one mosque [27].

Plačkovica Mountain is a mountain of medium height composed mostly of silicate bedrock, excluding marble formations between Vidoviste peak on the northwest side and the town of Radoviš on the southeast side, as well as a small area near Gaber peak where the local bedrock consists of Cretaceous sand-limestone. A moderate continental climate is typical for the region, but is modified by the influence of the

Tab. 1 Administrative characteristic and location of the study area.

Village	Macedonian name	Turkish name	Altitude (m)	Coordinates
Municipality: Karbinci (Карбинци, Karbinci)				
Kalauzliya	Калаузија	Kılavuzlu	735	41°47'7.99" N, 22°20'0.79" E
Kepekçeliya	Кепекчелија	Kepekçili	800	41°46'46.56" N, 22°20'11.61" E
Prnalija	Прналија	Pırnallı	900	41°45'20.08" N, 22°23'27.35" E
Kučica	Кучица	Kuçıça	800	41°44'30.52" N, 22°22'55.14" E
Municipality: Radoviş (Radoviş, Радовиш, Radoviş)				
Prnalija	Прналија	Pırnallı	650	41°39'39.61" N, 22°24'46.07" E
Ali Koç	Али Коч	Alikoç	750	41°40'43.77" N, 22°25'44.46" E
Kodzaliya	Коџалија	Kocalı	800	41°41'22.08" N, 22°25'13.26" E
Kalauzliya	Калаузлија	Kılavuzlu	650	41°40'11.4" N, 22°29'37.91" E
Municipality: Vasilevo (Василево, Vasilova)				
Visoka Maala	Висока маала	Yüksek Mahalle	555	41°33'19.04" N, 22°41'5.02" E

**Fig. 1** Map of the study area in Macedonia. Image adapted from Google Earth (<https://www.google.com/earth/>).

Mediterranean climate approaching from Strumica Valley on the southern slopes. A mountainous climate prevails on the upper parts. The northern part is well forested, but on southern slopes more or less degraded oak forests dominate. The average altitude is 861 m above sea level, and the total area is 933.76 km² [28] (Fig. 1).

We conducted this study in March and June 2014 by means of detailed, semi-structured interviews. The study comprised 48 key informants [most of them women (71%)], who ranged between 24 and 85 years of age. Interviews also involved five children (10–13 years of age), who participated in the collection of herbs for sale to a market purchaser.

The majority of Yörük informants were bilingual in both the Macedonian and the Yörük dialect (which belongs to the Turkic language group [29]); interviews were therefore conducted in both Macedonian and Turkish. Details of local names, ecology, part(s) used, transformations/processes, and local medicinal and food uses of all wild food, as well as wild and cultivated medicinal plants mentioned by the informants, were also recorded.

Prior informed consent was always verbally obtained before conducting interviews, and the ethical guidelines of the American Anthropological Association were followed [30].

During interviews, informants were asked to show the plants to which they referred. Digital photographs and voucher specimens of the most uncommon taxa were collected in the field and subsequently deposited at the Herbarium of the Botany Department of the University of Sofia, Bulgaria.

Taxonomic identification was conducted by the authors, and plant nomenclature was based on *Flora Europaea* [31], the Angiosperm Phylogeny Group III system [32], and The Plant List database [33].

Results

Sixty-seven plant taxa were recorded from 55 genera, based on the compilation of more than 150 reports concerning medicinal, food, forage, ornamental, and dye plants, as well as some elements relating to animals and minerals. Wild plants were the predominant species listed (36 taxa), followed by cultivated plants (26 taxa) and finally, semi-domesticated species (5). Listed plants belonged to 31 families, with Rosaceae (14 taxa) predominating, followed by Lamiaceae (6 taxa), Brassicaceae (5), Asteraceae (4), Solanaceae (4), and Polygonaceae (3). Besides these, it was further established that they also use one fungus that belongs to Lycoperdaceae. Detailed plant uses and remedies described by the informants during the field study are presented in Tab. 2.

Most of the plants reported by informants were personally collected by them in the regions surrounding their homes, or were grown in private yards and gardens. The villages are remotely located far away from main transport roads, and are thus more or less isolated. The natural surroundings provide a wide diversity of species, and locals often gather wild plants for food, medicinal, and ornamental purposes. Most houses (80%) have no separate, walled home gardens. People grow vegetables in gardens on the outskirts of the settlements, closer to small streams, flows, or other water sources. Most of the plant products for food, winter preserves, and spices are produced personally by the local people. Local people cook homemade couscous. They do not buy herbal teas from the market or pharmacies. Tradition, distance from large cities and other highly populated places, and poverty are reasons why local people rely on their own knowledge and skills in collecting products for food and daily needs.

Most of the informants identified ash, baking soda, raki, salt, honey, leather, spider webs, sheep rumen, mouse, coffee, and breast milk as home remedies – a total of 43 records (Tab. 3).

Local names

In total, more than 60 common names in the local language were given. In interviews conducted, Macedonian folk names were mentioned. Some of the plants were reported only in the Macedonian language, while others were only called by local names (Yörük dialect), which in most cases are similar to those of the Turkish language.

Discussion

All listed plants were divided into several main groups: edible wild plants (E); medicinal plants (M) [wild (W), cultivated (C), or semi-domesticated (SD)]; edible and medicinal plants (EM); and a combined group of plants used by the household for different purposes (H) (Fig. 2).

The group of plants having more than one use is significant (43%), as these uses often relate to different vegetative parts. Profound knowledge of the healing properties of plants (M; 21%) which are used for therapeutic home remedies, but also for other purposes (M+; 43%) is noteworthy. In total, they make up 64% of the recorded plant taxa. This is similar to the proportion of species that are not edible plants. Clearer differentiation is achieved when expressed in terms of E/H, as compared with

Tab. 2 Food and medicinal uses for plants and fungi recorded in the study area.

Taxon, family, and voucher specimen code (if available)	Recorded local name(s)	English name	Status	Plant part(s) used	Recorded preparation [treated pathology(-ies); medicinal/food use(s)]	Reports
Plants						
<i>Achillea millefolium</i> L. s. l., Asteraceae	Papadija ^{YO}	Common yarrow	W	AP	Tea; internal cleansing Tea; stomach pain	+ +
<i>Allium cepa</i> L., Amaryllidaceae	Sogan ^{YO} , Sogan ^{TR}	Onion	C	BU	Heated, crushed and externally applied; joint pain, painkiller, wounds Fresh juice; tooth pain (children)	++ +
<i>Allium sativum</i> L., Amaryllidaceae	Saramasak ^{YO} , Sarimsak ^{TR}	Garlic	C	BU	Fresh juice; ear pain Eat raw; hypertension Garlic+sheep yogurt mixed; hypertension Garlic+vinegar+water mixture; (hypertension) Clove put on the vein; tooth pain Amulet against <i>nazar</i> ; garlic+piece of glass	+ +++ + +++ +++ +++
<i>Amaranthus retroflexus</i> L., Amaranthaceae	Shtir ^{YO} , Илър ^{MK}	Redroot pigweed	W	AP	Forage	+
<i>Berberis vulgaris</i> L., Berberidaceae	Dozluk ^{YO}	Common barberry	W	RO	Dye; yellow	+
<i>Brassica nigra</i> (L.) Koch, Brassicaceae	Ardal ^{YO} , Hardal ^{TR}	Black mustard	C	FR	In pickle for hardness	+++
<i>Brassica oleracea</i> L., <i>Brassica oleracea</i> L. var. <i>capitata</i> , Brassicaceae	Laana ^{YO} , Lahana ^{TR}	Cabbage	C	LE	Sarma, pickle Fresh leaves; joint pain	+++ ++
<i>Brassica oleracea</i> L. var. <i>caulocarpa</i> (DC.) Alef., Brassicaceae		Kohlraabi	C	FL	Pickle Fresh juice; tooth pain	+ +
<i>Carlina acanthifolia</i> All., Asteraceae	Maaya ^{YO} , Maya otu ^{TR}	Acanthus thistle	W	RO	Yeast for cheese	++

Tab. 2 Continued

Taxon, family, and voucher specimen code (if available)	Recorded local name(s)	English name	Status	Plant part(s) used	Recorded preparation [treated pathology(-ies); medicinal/food use(s)]	Reports
<i>Chelidonium majus</i> L., Papaveraceae		Greater celandine	W	LX	Fresh latex; externally on skin after insect bites	+
<i>Cicer arietinum</i> L., Fabaceae	Leblebia ^{YO} , Leblebi ^{TR} , Леблебија ^{MK}	Chickpea	C	FR	Yeast for bread	+
<i>Cornus mas</i> L., Cornaceae	Karamluk ^{YO}	Cornelian cherry	W	FR	Snack pickle, vinegar	+++
<i>Corylus avellana</i> L., Betulaceae	Pandak ^{YO} , Fındık ^{TR}	Common hazel	W	LE	Tea; throat pain	+
<i>Crataegus monogyna</i> Jacq., Rosaceae	Muez ^{YO}	Common hawthorn	W	FR	Snack	+++
<i>Cucumis sativus</i> L., Cucurbitaceae	Salatalik ^{TR}	Cucumber	C	FR	Snack	++
<i>Cucurbita maxima</i> Duchesne, Cucurbitaceae	Kabak ^{TR}	Squash	C	FR	Cucumber+vinegar+water as mixture; stomach pain	+
<i>Cydonia oblonga</i> L., Rosaceae	Aiva ^{YO} , Ayva ^{TR}	Quince	SD/W	Soil under the tree (<i>ayva topragı</i> ^{YO})	Eat boiled; pain in upper part of stomach	+
<i>Euphorbia cyparissias</i> L., Euphorbiaceae	Mlechok ^{YO} , Млечок ^{MK}	Cypress spurge	W	LE	Soil is collected before sunrise and rubbed on the skin; allergy, skin problems	+
<i>Fagus sylvatica</i> L., Fagaceae	Dzhir ^{YO}	Common beech	W	LX	Tea; throat pain	+
<i>Ficus carica</i> L., Moraceae	Smokva ^{YO} , Смоква ^{MK}	Fig	W	FR	Fresh latex; styptic	++
<i>Fragaria vesca</i> L., Rosaceae	Gorica ^{YO} , Горлица ^{MK}	Strawberry	W	FR	Yeast for cheese	++
<i>Fraxinus excelsior</i> L., Oleaceae	Dushdubak ^{YO} , Djşbudak ^{TR}	Common ash	W	FR	Snack	+
				BK	Unripe fruits, jam	+
					Snack, jam	+++
					Vinegar (in the past)	+
					Dye for fibers	+

Tab. 2 Continued

Taxon, family, and voucher specimen code (if available)	Recorded local name(s)	English name	Status	Plant part(s) used	Recorded preparation [treated pathology(-ies); medicinal/food use(s)]	Reports
<i>Hypericum perforatum</i> L., Hypericaceae	Sara chai ^{YO} , Sarı çay ^{TR}	St. John's Wort	W	FL	Tea; cough, diarrhea, stomach pain Decoct in olive oil; bleeding	+++ +
<i>Juglans regia</i> L., Juglandaceae	Ores ^{YO} , OpeB ^{MK}	Common walnut	W	SE FPR LE UF	Snack Pericarp from the fresh, green fruits; dye for ready knitwear Dye for fibers Dye for hair	+++ + + +
<i>Malus domestica</i> Borkh., Rosaceae	Ikshii alma ^{YO} , Ekşi elma ^{TR}	Apple	SD/W	FR	<i>Oshaf</i> (dried and consumed boiled in water) Fresh juice; ear pain Vinegar Pickle Apple vinegar+raki, boiling and keep in bottle; externally massage for headache, and for varicose veins	+++ + + + +
<i>Malva sylvestris</i> L., Malvaceae	Slez ^{YO} , Çire3 ^{MK}	Mallow	W	LE	Cooked (in the past) Cooked like nettle Tea; swelling in the arms from more work	+ ++ +
<i>Marrubium peregrinum</i> L., Lamiaceae, AMN14004		Horehound	W	AP	Broom	+
<i>Matricaria chamomilla</i> L., Asteraceae	Papadia ^{YO} , Papatyā ^{TR} , Ποναίτζια ^{MK}	Chamomile	W	FL	Tea; flu, cough, general strengthening Tea; disinfection in bleeding	+++ +
<i>Mentha spicata</i> L., Lamiaceae	Nane ^{YO} , Nane ^{TR} , Mentra ^{MK}	Spearmint	W/SD/C	LE	Tea; stomach ache, diarrhea, cold, cough, headache, panacea	+++

Tab. 2 Continued

Taxon, family, and voucher specimen code (if available)	Recorded local name(s)	English name	Status	Plant part(s) used	Recorded preparation [treated pathology(-ies); medicinal/food use(s)]	Reports
<i>Morus</i> spp. (<i>Morus alba</i> L., <i>Morus nigra</i> L.), Moraceae	Dut ^{TR}	Mulberry	C	FR	Culinary herb Refreshment Snack	+++ +++ +
<i>Nicotiana tabacum</i> L., Solanaceae	Tutun ^{VO}	Tobacco	C	LE	Powdered, styptic	+++
<i>Ocimum basilicum</i> L., Lamiaceae	Festlian ^{VO} , Feslegen ^{TR}	Common basil	C	AP	Spice in sherbet, baklava Against bad eyes Bite by bee: mud+basil	++ + +++
<i>Origanum vulgare</i> L., Lamiaceae	Kara chai ^{VO} , Karaçay ^{TR}	Oregano	W	AP	Tea (tranquilizer), in fatigue, weakness	+++
<i>Polygonum bistorta</i> L., Polygonaceae	Ilan otu ^{VO} , Yılan otu ^{TR}	Common bistort	W	LE	Snake bite	+
<i>Piper nigrum</i> L., Piperaceae	Crn piper ^{VO} , Црн пипер ^{MK}	Black pepper	Import	FR	Decoct in raki; joint pain	+
<i>Plantago major</i> L., Plantaginaceae	Tegavec ^{VO} , Teraveit ^{MK}	Broadleaf plantain	W	LE	In pricking with thorn, swelling, purulence (fester), cover finger with leaves to remove thorn	+
<i>Prunus armeniaca</i> L., Rosaceae	Kaisi ^{VO} , Zardal ^{VO} , Kayisi ^{TR}	Apricot	C	FR	Dried fruits: <i>oshaf</i>	+++
<i>Prunus avium</i> L., Rosaceae	Kiraz ^{TR}	Sweet cherry	W/SD	SE	Seeds are crushed and put in olive oil, drop in ear; ear pain	+
<i>Prunus cerasifera</i> Ehrh., Rosaceae	Erik ^{VO} , Erik ^{TR} , Kiraz erigi ^{TR}	Cherry plum	W	FR	Pickle Juice Snack	+ + ++
<i>Prunus cerasus</i> L., Rosaceae	Vişne ^{VO}	Sour cherry	W/SD	LE	Added dried fruits: <i>oshaf</i> Added in pickle for hardness	+ ++

Tab. 2 Continued

Taxon, family, and voucher specimen code (if available)	Recorded local name(s)	English name	Status	Plant part(s) used	Recorded preparation [treated pathology(-ies); medicinal/food use(s)]	Reports
<i>Prunus domestica</i> L., Rosaceae	Erik ^{TR}	Plum	W	FR	Vinegar Added in dried fruits (<i>oshaaf</i>) Eat fresh; diarrhoea Added in dried fruits (<i>oshaaf</i>) Juice	+ + + +++ +
<i>Prunus spinosa</i> L., Rosaceae	Giiven ^{YO} , Güvem ^{TR}	Blackthorn	W	FR	Snack Tea; general strengthening	+++ ++
<i>Pyrus</i> sp., Rosaceae	Krusha ^{YO} , Круша ^{MK}	Pear	W	FR	Pickle Eat fresh	+++ +++
<i>Quercus</i> sp., Fagaceae	Dab ^{YO} , Даб ^{MK}	Oak	W	FR	Cooked like lentil or rice, meal named <i>kain</i> Snack	+ +
<i>Raphanus</i> red variety, Brassicaceae	Crvena repa ^{YO} , Црвена репа ^{MK}	Red radish	C	RO	Added in pickle for coloring	+
<i>Raphanus sativus</i> L., Brassicaceae	Riapa ^{YO} , Peņa ^{MK}	Radish	C	RO	Root+egg yolk; throat pain	+
<i>Rosa canina</i> L., Rosaceae	Karamlik ^{YO}	Dog rose	W	FR	Tea; general strengthening	+++
<i>Rubus caesius</i> L., Rosaceae	Kapinka ^{YO}	European dewberry	W	FR	Snack	+++
<i>Rubus idaeus</i> L., Rosaceae	Kapina ^{YO}	European raspberry	W	FR	Snack	+++
<i>Rumex acetosella</i> L., Polygonaceae		Sheeps sorrel	W	LE	Salad	+
<i>Rumex</i> spp., Polygonaceae	Labada ^{YO}	Dock	W	LE	Cooked, sarma, filling for pie (<i>börek</i>)	+++
<i>Sambucus nigra</i> L., Adoxaceae	Milver ^{YO} , Mürver ^{TR}	Black elderberry	W	FL	Tea; refreshment	+

Tab. 2 Continued

Taxon, family, and voucher specimen code (if available)	Recorded local name(s)	English name	Status	Plant part(s) used	Recorded preparation [treated pathology(-ies); medicinal/food use(s)]	Reports
<i>Sempervivum marmoratum</i> Griseb., Crassulaceae	Kulak otu ^{YO} , Kulak otu ^{TR}	Houseleek	W	LE	Instilled in the ear; ear pain	+++
<i>Sinapis arvensis</i> L., Brassicaceae	Zinap ^{YO} , Hardal ^{YO} , Hardal ^{TR} , Ардал ^{МК}	Wild mustard	C	SE	Added in pickle for hardness	+
<i>Solanum lycopersicum</i> L., Solanaceae	Yeshi patlidzhan ^{YO}	Tomato	C	UF	Pickle, jam	+++
<i>Solanum tuberosum</i> L., Solanaceae	Patlidzhan ^{YO}	Tomato	C	FR	Pickle, jam	+++
	Kompir ^{YO} , Компир ^{МК}	Potato	C	TU	Pilled; joint pain	+++
<i>Syzygium aromaticum</i> (L.) Merr. & L. M. Петру, Муттасе	Karanfil ^{YO} , Karanfil ^{TR} , Каранфил ^{МК}	Clove	Import	FLB	Pilled or sliced, externally as compress; headache, throat pain, fever	+
<i>Tanacetum parthenium</i> (L.) Sch. Bip., Asteraceae, AMN14012	Попадџа ^{МК}	Feverfew	W	AP	Chewed; tooth ache	+++
<i>Teucrium chamaedrys</i> L., Lamiaceae	Dalak otu ^{TR}	Wall germander	W	LE	Spice in sherbet	+
					Jewelry, necklace (young woman, bride)	+++
					Tea; sedative, stomach pain	++
					Compress from fresh leaves on neck area as anaphrodisiac (anti aphrodisiac) “anti sex crusader”	+
<i>Thymus</i> spp., Lamiaceae, AMN14017	Keklik otu ^{YO} , Keklik otu ^{TR} , Мајчина душица ^{МК}	Thyme	W/C	AP	Compress with honey; for foot- and mouth disease in cloven-hoofed animals	+
					Tea; childlessness	+
					Tea; tranquilizing, bladder	+++
<i>Tilia cordata</i> Mill., <i>Tilia tomentosa</i> Moench, Malvaceae	Lipa ^{YO} , Lipa ^{МК}	Lime tree	SD	FL	Tea; tranquilizing	+

Tab. 2 Continued

Taxon, family, and voucher specimen code (if available)	Recorded local name(s)	English name	Status	Plant part(s) used	Recorded preparation [treated pathology(-ies); medicinal/food use(s)]	Reports
<i>Urtica dioica</i> L., Urticaceae	Kopresh ^{YÖ} , Koprish ^{YÖ}	Stinging nettle	W	LE	Cooked, filling for pie (<i>börek</i>), healthy food, <i>tuga</i> Mess with rye flour Tea; general strengthening Tea; yellow nails	+++ + + +
<i>Vicia sativa</i> L., Fabaceae	Burchak otu ^{YÖ} , Burçak otu ^{TR}	Common vetch	W	AP	Fresh leaves, rubbed; joint pain Yeast for bread	++ +
<i>Vitis vinifera</i> L., Vitaceae	Iaprak ^{YÖ} , Yaprak ^{TR}	Grape	W/C	LE FR	Sarma Pickle Jam	+++ +++ +
<i>Zea mays</i> L., Poaceae	Misir ^{YÖ}	Corn	C	FR	Boiled with ash, in winter	+++
Fungi						
<i>Calvatia</i> sp. [<i>C. utriformis</i> (Bull.) Jaap, <i>C. gigantea</i> (Pers.) Lloyd], Lycoperdaceae	Pufka ^{YÖ} , Пубка ^{MK}	Giant puffball, Puffball	W	SP	Powder from spores; styptic	+++

Legend:

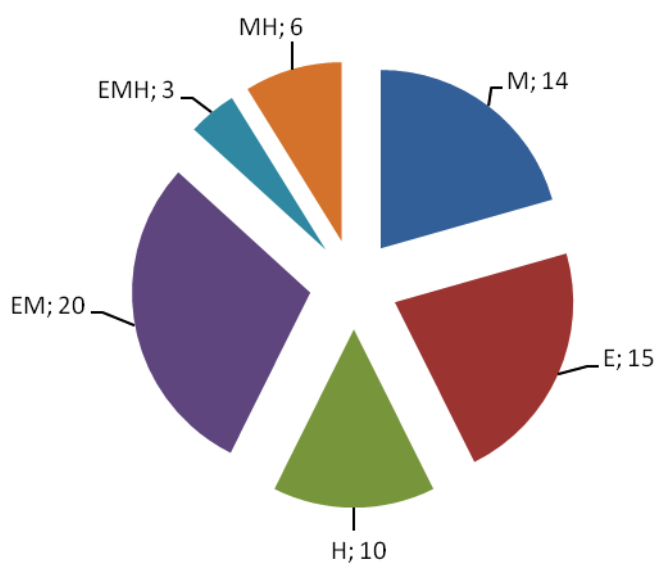
YÖ – Yörük folk name(s); MK – Macedonian folk name(s) recorded among Yörüks; TR – Turkish folk name(s) recorded among Yörüks.

C – cultivated; SD – semi-domesticated; W – wild.

AP – aerial part; BK – bark; BU – bulb; FL – flower; FLB – flower bud; FPR – fruit pericarp; FR – fruit; LE – leaves; LX – latex; RO – root; SE – seed; SP – spore; TU – tuber; UF – unripe fruit. + – reported by less than 10% of the informants; ++ – reported by more than 10% but less than 20% of the informants; +++ – reported by more than 20% of the informants.

Tab. 3 Food, medicinal, and other domestic uses of non-indigenous plants, as well as animal, mineral, and industrial products reported for the study area.

Product (local name)	Local use	Reports
Ash	Styptic (bleeding). Externally applied to cuts.	+
Baking soda	Joint pain. Externally by rubbing.	+
Breast milk	Eye pain, ear pain.	+++
Gunpowder matches	Toothache. Externally by rubbing around the tooth.	+
Leather	Styptic. Externally applied to cuts.	+
Mice (Siçan), <i>Mus musculus</i> L., Muridae	Ear pain. Newly born, naked, white house mouse, placed in a bottle with oil, and kept in the dark.	++
Olive oil, <i>Olea europaea</i> L., Oleaceae	Ear pain. Externally, place a drop of slightly warmed oil in the ear.	+
Raki	Skin, joint pain, toothache. Styptic; externally applied to cuts. Stomach pain; drink small glass.	+++
Salt	Toothache. Externally by rubbing around the tooth.	+++
Spider web	Styptic. Externally applied to cuts.	+++
Coffee (Kara kafe-kahve), <i>Coffea arabica</i> L., Rubiaceae	Drink for headache and for high blood pressure.	+++
Honey	Eye problems. Mix with water and place drop in eye.	+
	Fever. Antipyretic. Externally applied to forehead.	+
	Testicular pain. Externally applied.	+
Vinegar	Joint pain. Externally applied.	+
Rumen of sheep	Yeast for cheese.	+

**Fig. 2** Grouping of recorded plants, according to their use. E – edible plants; M – medicinal plants; H – plants used by the household; EM – edible+medicinal; EMH – edible+medicinal+household use; MH – medicinal+household use.

E/M: plants that are used by households are not usually used as edible plants, whereas in many cases edible plants are seen as having medicinal properties.

According to historical sources, as well as our observations, the Yörüks became settled and now inhabit infertile land, which explains the large number of wild plants that they use in their daily lives, which, in turn, corresponds with the high percentage of wild plants recorded in Tab. 2 (W; 67.2%). Some wild plants are semi-domesticated (SD, W/SD; 7%), and from the listed taxa, significantly fewer are cultivated plants (C; 31%). Cultivated plants are much less prevalent than wild plants compared to similar studies undertaken for the plain regions [22], but this is also true of some other isolated communities located in the nearby mountains [17,18,20,21]. One possible reason for this is the preservation of the nomadic mode of life – simplicity, pragmatism, and the ability to conserve important key elements (including the plants used) despite changes, both natural and social, to their immediate environment.

Parts of plants that are used

Most of the recorded plants are used for their fruit (FR; 36%). These are many local wild and garden tree and shrub species (W, SD, and C), such as cherry, sour cherry, plum, quince, fig, apple, pear, apricot, and mulberry, as well as raspberry, dewberry, blackthorn, common hawthorn, common hazel, and grape. These fruits are used continuously throughout the year, either fresh or dried, or are prepared for winter as compote or jam. They are an important part of the seasonal food diet of local populations. To this group also belong cultivated plants, such as cucumber, squash, and tomato, which are also used throughout the year as fresh foods as well as fermented pickles.

Second in importance is the group of plants whose leaves are collected and used for food (LE; 27%) for main meals, fillings for pie, *börek* and *sarma* (*Urtica dioica*, *Rumex* spp., *Vitis vinifera*, *Malva sylvestris*, and *Brassica* spp.), herbs (*Mentha* spp.), therapeutic agents (*Plantago major*, *Sempervivum marmoratum*, and *Polygonum bistorta*), and natural dyes (*Juglans regia*). Flowering aerial parts of herbaceous plants (AP; 12%) are collected primarily for medicinal herbal teas (*Achillea millefolium*, *Origanum vulgare*, *Tanacetum parthenium*, *Thymus* spp., *Teucrium chamaedrys*), herbs (*Ocimum basilicum*), forage (*Amaranthus retroflexus*), and brooms (*Marrubium peregrinum*). In addition, Yörüks collect underground plant parts, such as roots (*Berberis vulgaris*, *Carlina acanthifolia*, *Raphanus* spp., and *Urtica dioica*), bulbs (*Allium* spp.) and tubers (*Solanum tuberosum*), and aerial parts (flowers of *Tilia* spp. and bark of *Fraxinus excelsior*). They represent 37% of plants recorded in this study (Tab. 2).

A good example of their observational skills, creativity, and botanical knowledge is their use of giant puffball spores (*Calvatia gigantea*) and cypress spurge latex (*Euphorbia cyparissias*), both of which are very useful styptics. Many parts, such as leaves, seed, unripe fruit, and fruit pericarps of walnut are used for various purposes.

Edible plants

Interestingly, all the informants found it difficult to identify the traditional dishes that are customarily cooked on holidays and those to be typical fare for Yörüks. This is in stark contrast to observations made on other minorities in Southeastern Europe, such as Tartars in Romania [22]. Some informants recognized pie (*börek*) filled with nettle leaves, called *tuga*, as being typical. For Yörüks, only the older and larger nettle plants are suitable for eating. This once again demonstrates the diverse perception of local

Balkan communities with regard to the most appropriate vegetative phase to use when preparing this very popular edible species [7,8,13,22,34]. Nettle is an important plant for Yörüks, who also know it well as the basis of a herbal tea used as a general tonic and as an infusion for external use in dermatological applications.

Of great interest is our discovery that Yörüks prepare a dish based on acorns, which they call *kain* and cook them as they would lentils or rice. Equally interesting is their use of unripe beechnuts. This type of meal is known from the Balkan region mainly from historical and ethnographic records as a way of surviving during periods of starvation [7]. Here, locals reported that it is still eaten today.

When cooking, Yörüks use very few herbs. The main condiment is mint. It is used in all dishes and is dried in large quantities in each home (Fig. 3).

It is well known that plant additives are used in the preparation of lacto-fermented foods, which are considered healthy foods, for use during winter, and this is considered typical for the Balkan population [8,11,35]. It was reported that a red variety of *Raphanus* spp. was used for coloring *turshija*, together with *Brassica nigra* and *Sinapis arvensis* for best flavor and quality, respectively.

For a large number of plants used for food, and in particular prepared meals, Yörüks emphasized the importance of healthy foods for the winter period. These included corns boiled with ash, *sarma* from vine or cabbage leaves, pickles, jams, compote, and dried fruit. Similarly, they used plants such as garlic, onion, and walnut.



Fig. 3 Dried spearmint (*Mentha spicata*) hanging by string on a house wall (Kučica village).

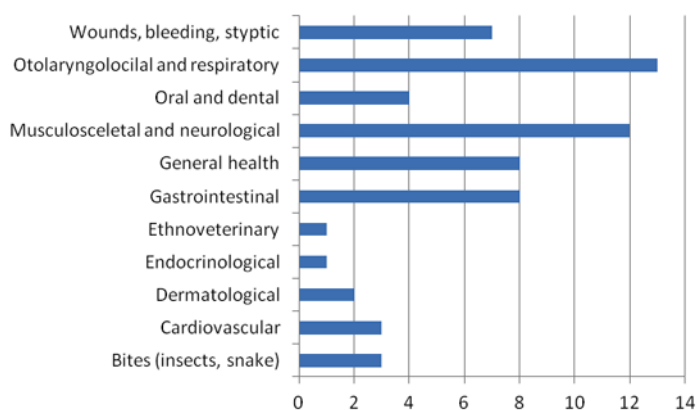


Fig. 4 The most widely reported systemic disorders based on the number of records.

Medicinal plants

Plants are used for a very wide range of complaints. Plants were recorded in more than 50 preparations as home remedies (Fig. 4).

As expected, the largest proportion was used for treating gastrointestinal and upper respiratory tract disorders, and this is consistent with data obtained from previous studies relating to everyday minor ailments [6,15,17,18,20–22,36].

Very impressive is the relatively large number of home remedies used for musculoskeletal and neurological disorders, as well as plants and preparations used for the treatment of physical injuries associated with bleeding and pain. Plants used for oral and dental care were also well represented.

A very interesting case is the use of *Sempervivum marmoreum* for the treatment of ear pain. Juice of fresh leaves is dropped directly into the problematic ear. The local Yörük name *kulak otu* is related to the medicinal properties of this plant. More than 93% of the informants reported it.

Sempervivum marmoreum is an evergreen plant endemic to the Balkan Peninsula. The use of *Sempervivum* spp. as a medicinal herb primarily used for diseases of the ear and related pain symptoms is well known and described in ethnobotanical studies. *Sempervivum tectorum* is a species found in many parts of Europe, including Romania, Kosovo, Albania, and Serbia [37–42]. Furthermore, *S. tectorum* has been reported as a cure for shingles, dysentery, and headaches [42]. It is an effective agent for the treatment of wounds, sores, burns, abscesses, or painful areas; the juice, freshly squeezed from leaves, as well as refrigerated juice, is a certain remedy for insect bites and for easing ear pain and inflammation, while tea prepared from its leaves is recommended for the treatment of ulcers [38]. Traditional knowledge of the anti-oxidant and antimicrobial properties of different extracts of *S. marmoreum* was tested. Results show that a methanolic extract of houseleek leaves is a potentially effective natural product, especially given its anti-microbial activity against *Aspergillus niger* and *Candida albicans* [38]. Recent studies report that *Aspergillus* and *Candida* spp. are the most frequently isolated fungi in patients with otomycosis and demonstrate the etiological significance of *Candida albicans* in otitis externa [43,44].

It is known that cultural markers always relate to ethnicity. Their conversion into ethnic markers occurs when the community accepts them as a symbol. Such is the case here for *S. marmoreum*. As a well-known medicinal plant, for Yörüks it has become transformed into a border marker associated with the space around the house, partly having a decorative purpose and also use as a medicinal plant, uniquely relieving ear pain.

Sempervivum tectorum occurs as a cultural marker for two groups in Spain sharing similar environmental conditions but different sociolinguistic backgrounds. For instance, *S. tectorum* leaves are only used for earache in the Basque-speaking regions, whereas *Cistus salviifolius* is used in the Spanish-speaking territories of Alava [45].

Sempervivum has not been reported in studies of Macedonians and Gorani in the Shar Mountains (northwestern Macedonia); the plant also occurs on hilly or mountainous terrains [17,18], mountain villages of Preshkopia, eastern Albania [20], western Macedonia [21], and on Mount Korab [46]. These areas and communities are geographically close and similar in terms of environment and degree of isolation. In Bulgaria, *Sempervivum* has more than 12 folk names, but the names refer to the specific thickness of the leaves of the plant used externally for skin irritations, cough, and other symptoms. Only in areas with a Turkish ethnic minority is the Turkish name *kulak otu* mentioned [47].

Moreover, in each home, *Sempervivum* is grown as an ornamental, perennial evergreen so that it is constantly available, even though cultivation of ornamental plants

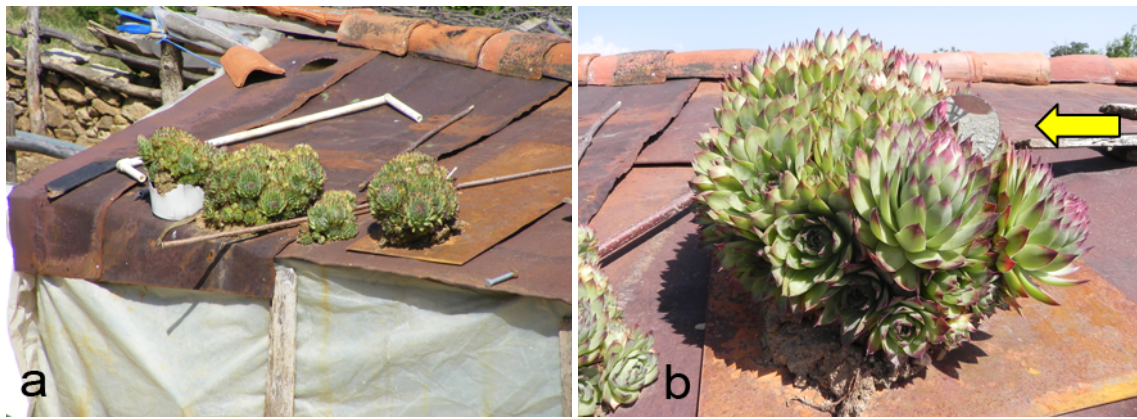


Fig. 5 Houseleek (*Sempervivum marmoratum*) on a metal roof of a back-yard building (Prnalija village) (a,b). A small round mirror is placed between plants to collect sunlight (arrow in b).

by Yörüks is not common (Fig. 5). The housing and surrounding area can be very poor, and the lifestyle pragmatic, and simple [27]. It fares well, retaining its vigor during transportation and is not very demanding of suitable growing conditions.

A relatively limited number of plants is used specifically for herbal tea, mostly for refreshment and as a general tonic: *Hypericum perforatum*, *Thymus* spp., *Mentha spicata*, *Matricaria chamomilla*, *Origanum vulgare*, and *Sambucus nigra*. All informants indicated that the thyme has a strong lemon smell. For some of the plants, such as *Matricaria chamomilla*, many locals said, “It has a bitter taste, and we do not use it”.

Lime tree is rarely mentioned by informants as a plant for making tea; rather, it is best defined as “unknown”. This is contrary to the data obtained for surrounding areas of Macedonia and adjacent countries [17–19,22,36]. Lime trees were not observed amongst the vegetation of the research area. Yörüks only use herbs gathered from field-grown plants, rather than those purchased from stores, for herbal teas.

Yörüks reported relatively large numbers of plants and tools used as a source of yeast for making bread or cheese, including *Carlina acanthifolia*, *Cicer arietinum*, and *Euphorbia cyparissias*, as well as the rumen of sheep. We know only of their use in the Balkans, and this is based mainly on ethnographic sources [48,49]. Here, informants reported that these plants are vital and are currently used.

In order to clean the open areas of their yards, Yörüks use a homemade broom made from *Marrubium peregrinum* (Fig. 6), which is similar to the use of *M. vulgare* in surrounding areas [3].

Casual clothing for women includes a headscarf, tunic, and trousers in very bright and contrasting colors (pink, magenta, red, yellow, and blue), of necessity decorated with floral motifs. This everyday clothing clearly distinguishes and separates them from the populations of all nearby villages (Fig. 7).

During festival days, the clothing worn by young girls includes a necklace of cloves alternating with beads (Fig. 8). All informants reported this.

Use of a clove necklace (*karanfil kolye*), prepared from the dried flowering buds of *Syzygium aromaticum* has been reported in the western and southern Anatolian regions of Turkey; this tradition has been seen in the past and is still seen today. It is especially common in cities of Manisa, Mugla, Izmir, Afyon, Aydın, and Isparta, and is generally of Turkmen origin [50–57]. The most popular novelist in the Turkic world, as well as Anatolia, is Chinghiz Aytmatov, who is Kyrgyz (and is the best-known author of Kyrgyzstan literature). He referred to these necklaces in his novel *Elveda, Gülsarı!* (*Прощай, Гульсары!*, 1966). Like the Yörüks of Macedonia, these necklaces are mostly used at weddings and bairams (religious holidays). This is a very old tradition and is favored by girls and brides for the scent of the cloves that line the



Fig. 6 Homemade broom made from a bundle of horehound (*Marrubium peregrinum*), tied with plastic string for cleaning the yard (Prnalija village).



Fig. 7 Women from Yörük villages with casual wear (Kučica and Prnalija villages).

strings. It is reported that this same tradition also occurs in Jordan [58]; this type of necklace is known as *qladet qrenfel*. In Algerian Berber society, this type of necklace is also used and is called *tazlagt n qrenfel* [59,60].

Plants used for *nazar* (believed to protect against the evil eye), include garlic and basil, which are well known as amulets in the Balkans. Basil is very common in Orthodox Christian rituals [36], but is less used by Muslims [61].

A nomadic lifestyle requires the use of tools for treatment that are used in everyday life and that are not dependent on local and variable environmental conditions. This is probably the reason for the absence of many plant-based remedies and everyday tools in current traditional knowledge; see Tab. 2 and Tab. 3. Perhaps this is the aspect of traditional knowledge that most closely approaches the original knowledge of this ethnic group, and it is this that has been handed down and preserved to the greatest extent in the past, during and following the migration period.

Very well known, used and greatly cited are the use of breast milk for eye infections, the use of spider webs and salt as styptics, and the use of coffee and raki for a wide range of ailments. Raki is an alcoholic drink distilled from the pulp of different fruit. Yörüks do not produce homemade raki, as reported by many informants, but they often cite it as a homemade remedy for internal and external uses, and this is commonly used in most of the Balkans [7,17,20–22,36].

An interesting finding is the following recipe for earache: it is prepared by placing young, naked mice in water or olive oil until they decompose. Some data for such an old home remedy have ethnographic sources in Bulgaria, but the data are very limited. Also, it should be emphasized that this remedy is used in the treatment of wounds inflicted by glass [47]. Newly born mice in olive oil are used not only in the Balkans, but also in Spain for the same medicinal purpose [62,63].

The data from our field study show several major ethnic boundary markers that maintain the homogeneity of the community and also distinguish it sufficiently from the surrounding society. Such boundaries include the following: (i) for the study area, well-isolated Yörük groups aggregate in mountain villages, which are located far from main roads; (ii) they maintain the local dialect and endogamy; (iii) their women wear distinctive casual cloths, which are decorated with floral motives; (iv) they wear ceremonial jewelry comprising a necklace of cloves; (v) unusually, they grow *Sempervivum marmoreum* as their only ornamental plant since it has medicinal properties; and (vi) *Mentha spicata* is locally dominant culinary herb, but it also has medicinal use (Fig. 9).

Ethnic boundary markers demarcate, at first sight, the visible isolation of the community, which is the intended effect and the result of historical nomadic roots, and of a contemporary settled lifestyle.

Isolation of the community (homogeneity of villages) is a condition that differs greatly from that of multiethnic communities, as found amongst the Tatars in Romania [22]. Heterogenous cultural environments would in fact require more diverse communities living in the surroundings and possibly there would not be “recognized” at first glance. Yörüks have several plants that can be described as keystones in their traditional folk knowledge: *Syzygium aromaticum* (ornamental and ritual, medicinal plant for toothache, spice in sherbet), *Sempervivum marmoreum* (medicinal and ornamental), and *Mentha* spp. as a universal herb. The use of these plants must be supplemented with modern knowledge and the use of a significant number of non-plant-based remedies and tools for the treatment of ailments and for generally improving lifestyle.

Comparison of the collected ethnobotanical data with that of similar, more or less isolated ethnic groups in the Balkan area shows that 12 taxa are used in the same or



Fig. 8 Ritual jewelry worn by women include a clove necklace (*karanfil kolye*), prepared from the dried flowering buds of *Syzygium aromaticum* and beads.

similar manner amongst Albanians and Macedonians in the Sharr Mountains [17], 17 taxa amongst Macedonians and Albanians living in Gollobordo (eastern Albania) [20], 21 taxa amongst Albanians from the upper Reka valley, Mount Korab (western Macedonia) [46], and 19 taxa amongst the mountain villagers of Preshkopia (eastern Albania) [21]. Overlapping taxa include mainly plants whose fruit are used as fresh foods, such as strawberry, raspberry, blackberry, pear, apple, cherry, sour cherry, hawthorn, and mulberry. A similarity between these societies is the use of nuts, such as walnut and hazelnut, as well as edible greens, including nettle, cabbage, sorrel, and grape leaves. Onion and garlic are important for most as edible plants, spices, and medicinal plants. There is a large discrepancy regarding the use of all these overlapping taxa as home remedies. Of these groups, the most popular group of species that are also used in folk medicine includes *Achillea millefolium*, *Cornus mas*, *Hypericum perforatum*, *Juglans regia*, *Mentha* spp., *Origanum vulgare*, *Plantago major*, *Thymus* spp., and *Urtica dioica*. Specific to the Yörüks investigated is the active use of home remedies and edible plants that until now were known only from past ethnological data for the Balkan region.

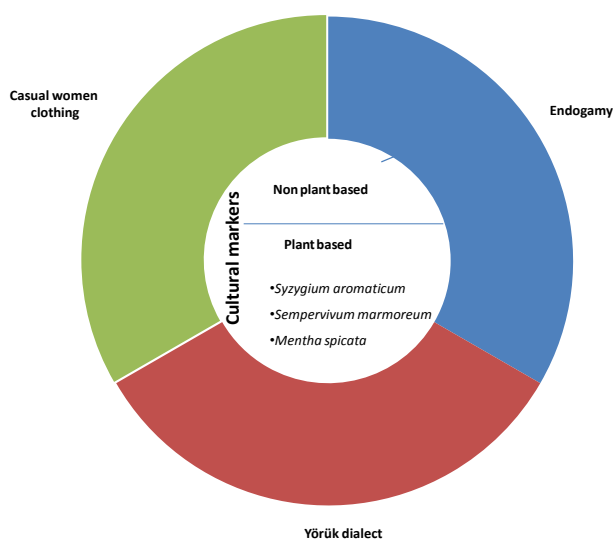


Fig. 9 Ethnic border lines, outlining the system of symbols (cultural markers) of the Yörük community in the study area.

Due to the remoteness of the time of migration and settlement of the Yörüks, it is difficult to determine which plants used today originally came from the host or home environment of the Yörüks. The behavior and customs that still exist today support two processes: (i) adaptation to the flora of the new host country and (ii) continued use and acquisition of flora from the original home countries of the migrants [64]. There is at least some degree of importance in the migrant group sharing knowledge with local communities that make use of (other) medicinal plants.

Conclusions

Yörüks can be considered a remarkable cultural phenomenon in a multicultural and complex environment in the Balkans. This community

has nomadic traditions, but nowadays has a settled lifestyle. Traditional knowledge is stored within a well-defined cultural boundary involving the local dialect, endogamy, and specific casual clothing. The key for understanding the traditional knowledge of Yörüks is their “nomadic roots”. Using many of the most well-known ethnographic sources for the region, we could assess that in the Yörük area the use of plants remains well alive nowadays. The group of cultural markers is characterized by elements that can be seen as permanent, and independent of a changing external environmental, and by social factors characteristic of a former nomadic way of life, namely, the use of dried plants, and not many plant-based remedies.

Acknowledgments

This article was written with utmost respect for the community of Yörüks who, with great dignity, have kept and followed their nomadic traditions despite the tremendous pressures placed on them by globalization. We express our enormous gratitude to all the inhabitants of the villages of Kepekčeliya, Prnalija, Kučica, Ali Koč, Kodzalija, and Visoka Maala and both Kalauzliya villages, who unreservedly shared with us their knowledge and experience of plants, and we thank them for their generous hospitality.

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