



## Edible and medicinal plants in some communities of Dusheti municipality (East Georgia, Caucasus)

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World Journal of Advanced Research and Reviews, 2024, 22(01), 1014–1022

Publication history: Received on 06 March 2024; revised on 12 April 2024; accepted on 15 April 2024

Article DOI: <https://doi.org/10.30574/wjarr.2024.22.1.1158>

### Abstract

Plants used for food and medicinal purposes by the local residents in different communities of Dusheti municipality of Mtskheta-Mtianeti region have been studied. Surveys have been conducted in 4 communities - Choporti, Bazaleti, Ananuri and Mchadijvari, which unite 51 villages. Edible plants were divided into two main groups: cultural and wild plants. Both groups unite herbaceous as well as woody plants. 37 species of cultural herbaceous and 20 species of woody plants used for food have been identified. Wildly growing edible plants include 27 species (13 species of herbaceous and 14 woody plants). Local residents mainly use wild plants for medicinal purposes, including 13 herbaceous and 13 woody plants. The variety of cultural plants used for medicinal purposes is relatively less (4 herbaceous and 3 woody plants). The research revealed the process of genetic erosion of aboriginal and endemic species and varieties of plants in the studied communities. The local population has almost completely switched to the use of modern high-yielding and widespread crops and varieties. Compared with the other crops, local varieties of fruit trees are more preserved, while vegetables and grain crops are represented almost entirely by foreign varieties. This process originates from the Soviet period and continues for the last 30 years.

**Keywords:** Cultural and wild plants; Species; Varieties; Use of plants

### 1. Introduction

The knowledge about the plants, accumulated within the cultures of different nations, is important achievement of the mankind. Information regarding the various ways of using the plants is preserved in tradition and life of each nation. Finding this information and traditions and using them for modern purposes is one of the most important issues. The presented scientific research serves to find the remaining information about the traditional use of plants and to reveal the aboriginal and endemic varieties of plants in one of the Caucasus regions.

The use of plants for various purposes in the life of the Georgian nation was passed down from generation to generation and was enriched with new information, however, recently these traditions have been broken and valuable information is being lost.

The research object was Dusheti Municipality of Mtskheta-Mtianeti region (Eastern Georgia). From the ethnobotanical point of view, Mtskheta-Mtianeti is one of the distinguished parts of Georgia, where many plants were domesticated and their varieties bred, besides, the traditions and culture of economic use of various wild plants were established. Due to

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these circumstances, rich ethnobotanical knowledge reflecting the millennia-old relationship between plants and humans has been accumulated, which is preserved in the traditions and culture of this region.

Most of the villages included in the mentioned communities are located close to Tbilisi, the capital of Georgia, and are closely connected with it, reflecting the social condition of the population of these villages.

Cattle breeding, fruit growing, agriculture and horticulture are mainly developed in the studied communities.

Although various ethnobotanical surveys have been conducted in some regions of Georgia in recent years [1, 2, 3, 4, 5, 6, etc.], Dusheti municipality has not been studied from this viewpoint, and no ethnobotanical data can be obtained.

The aim of the research was to identify the assortment of plants used for food and medical purposes in different communities of Dusheti municipality; to identify aboriginal species, varieties and crops of plants and determine to what extent they are preserved, whether their gene pool is endangered; to establish the rules and forms of traditional and modern use of plants.

## 2. Material and methods

### 2.1. Study area

Dusheti municipality is outstanding in terms of natural landscapes and ethnographic diversity. It includes both southern and northern slopes of Greater Caucasus. Besides the town Dusheti, it includes 17 communities. The villages of 4 communities had been selected as the research object. These communities are: Choporti, Bazaleti, Ananuri and Mchadijvari, which unite 51 villages.

The study area is located in the basins of the Aragvi and the Ksani Rivers and belongs to the low and medium mountainous region. The area is characterized by a complex terrain with alternation of ridges, plateaus and valleys. There are also plains in the Choporti area. The villages are located within 560-1400 meters above the sea level. Most of the settlements (33 villages) are located within 800-1000 meters above the sea level, 9 villages - above 1000 meters, and 8 villages - above 600 -800 (780) meters above the sea level. The lowest village is Choporti (560 m above sea level). Abandoned settlements can also be found in the territory.

Despite of the small area, three climate zones are distinguished in the research territory: 1. Transitional climate from a moderate warm steppe to a moderate humid with hot summers and two minimums of precipitation per year (BS-Cxa); 2. Moderate humid climate with moderately cold winter and prolonged warm summer, precipitation two minimum per year (Cxb); 3. Moderate humid climate with cold winter and prolonged cold summer, precipitation two minimum per year (Dxbk') [7, 8].

Mainly there are cinnamonic calcareous and brown forest unsaturated soils. Cinnamonic, meadow cinnamonic and mountainous meadow turf-peat soils cover small areas. Alluvial calcareous soils are developed in a narrow strip on the banks of the Aragvi River and its tributaries [7, 8, 9, 10].

### 2.2. Data collection

**Table 1** The number and composition of the respondents

Respondent	Age						
	Up to 30	31-40	41-50	51-60	61-70	Over 70	Total
Woman	3	5	7	13	16	12	56
Man	-	-	3	10	12	16	41
Total	3	5	10	23	28	28	97

Field surveys were carried out in the form of semi-structured interviews (pre-prepared and verified questionnaires). Based on their informed consent, 97 respondents were interviewed considering the gender balance (56 women and 41 men). The age of the respondents was 28-82 years (Table 1). Individual field interviews were conducted in the

homesteads of the participants. Multifaceted information was collected about the plants used by the local population for different purposes. At the same time, attention was paid to the trends of genetic erosion of local species and varieties.

### 2.3. Name of plants

The Latin names (scientific name) of the plants are in accordance with the international plant databases [11, 12, 13, 14, 15].

The local names of the plants are given according to names used by the population of the surveyed villages.

## 3. Results and discussion

### 3.1. Edible Plants

About 82 species of plants, used as a food by the local population, were identified in the study region. They were divided into two main groups: (1) cultural plants and (2) wild plants. Both groups are represented by herbaceous and woody plants.

The range of cultural herbaceous plants is diverse (Table 2). Vegetables, grain and oilseed crops, as well as spices, are mostly common. Watermelon, pumpkin and strawberry are rarely grown.

**Table 2** Edible cultivated herbaceous plants

Species	Family	Local Name (transliteration)	Plant part used
<i>Allium cepa</i> L.	<i>Amaryllidaceae</i>	Khakhvi	bulb, leave
<i>Allium ampeloprasum</i> ( <i>A. porrum</i> L.)	<i>Amaryllidaceae</i>	P'rasa	bulb, leave
<i>Allium sativum</i> L.	<i>Amaryllidaceae</i>	Niori	bulb, leave
<i>Anethum graveolens</i> L.	<i>Apiaceae</i>	K'ama	leave, stem, seed
<i>Apium graveolens</i> L.	<i>Apiaceae</i>	Niakhuri	leave, stem, root
<i>Avena sativa</i> L.	<i>Poaceae</i>	Shvria	seed
<i>Beta vulgaris</i> L.	<i>Amaranthaceae</i>	Ch'arkhali	leave, taproot
<i>Brassica napus</i> L.	<i>Brassicaceae</i>	Talgamura	leave, taproot
<i>Brassica oleracea</i> L.	<i>Brassicaceae</i>	K'ombost'o	leave
<i>Brassica rapa</i> L.	<i>Brassicaceae</i>	Talgami	leave, taproot
<i>Capsicum annuum</i> L.	<i>Solanaceae</i>	Ts'its'ak'a	fruit
<i>Citrullus lanatus</i> (Thunb.) Matsum. & Nakai ( <i>Citrullus vulgaris</i> Schrab.)	<i>Cucurbitaceae</i>	Sazamtro	fruit
<i>Coriandrum sativum</i> L.	<i>Apiaceae</i>	Kindzi	leave, stem, seed
<i>Cucumis sativus</i> L.	<i>Cucurbitaceae</i>	K'it'ri	fruit
<i>Cucurbita pepo</i> L.	<i>Cucurbitaceae</i>	Gogra	fruit, seed
<i>Daucus carota</i> subsp. <i>sativus</i> (Hoffm.) Atcang.	<i>Apiaceae</i>	St'apilo	taproot
<i>Foeniculum vulgare</i> Mill.	<i>Apiaceae</i>	Didi k'ama	leave, stem
<i>Fragaria ananassa</i> (Weston) Rozier	<i>Rosaceae</i>	Marts'q'vi	fruit
<i>Helianthus annuus</i> L.	<i>Asteraceae</i>	Mzesumzira	seed
<i>Hordeum vulgare</i> L.	<i>Poaceae</i>	keri	seed
<i>Lactuca sativa</i> L.	<i>Asteraceae</i>	Salata	leave

<i>Lepidium sativum</i> L.	<i>Brassicaceae</i>	Ts'its'mat'i	leave
<i>Lycopersicon esculentum</i> Mill. ( <i>Solanum lycopersicum</i> L.)	<i>Solanaceae</i>	P'omidori	fruit
<i>Mentha pulegium</i> L.	<i>Lamiaceae</i>	Ombalo	leave, flower
<i>Mentha x piperita</i> L.	<i>Lamiaceae</i>	P'it'na	leave, stem
<i>Ocimum basilicum</i> L.	<i>Lamiaceae</i>	Rehani	leave
<i>Petroselinum crispum</i> (Mill.) Fuss	<i>Apiaceae</i>	Okhrakhushi	leave, stem
<i>Phaseolus vulgaris</i> L.	<i>Fabaceae</i>	Lobio	fruit, seed
<i>Raphanus sativus</i> L.	<i>Brassicaceae</i>	Bolak'i	taproot
<i>Satureja hortensis</i> L.	<i>Lamiaceae</i>	Baghis kondari	leave, stem
<i>Secale cereale</i> L.	<i>Poaceae</i>	Ch'vavi	seed
<i>Solanum melongena</i> L.	<i>Solanaceae</i>	Badrijani	fruit
<i>Solanum tuberosum</i> L.	<i>Solanaceae</i>	K'art'opili	tuber
<i>Spinacia oleracea</i> L.	<i>Amaranthaceae</i>	Isp'anakhi	leave
<i>Triticum aestivum</i> L.	<i>Poaceae</i>	Khorbali	seed
<i>Vicia faba</i> L.	<i>Fabaceae</i>	Tsertsvi	seed
<i>Zea mays</i> L.	<i>Poaceae</i>	Simindi	seed

*Pyrus communis* L., *Prunus divaricata* Ledeb., *Prunus domestica* L., *Malus domestica* (Suckow) Borkh., *Cydonia oblonga* Mill., *Juglans regia* L., *Cornus mas* L., *Corylus avellana* L., *Prunus avium* (L.) L., *Prunus cerasus* L. are the main ones among the cultural woody crops of the area. They are mostly represented in different varieties and forms. Other cultures are relatively rare. Vine, which is one of the oldest cultures of Georgia, and Georgia is recognized as one of the centres of its origin, should be especially noted. Due to the climate and relief conditions, in the research area vineyards are very rare and can be found only in the Tchoporti community. Accordingly, wine is hardly pressed from the grapes and it is used only as food and for making compotes. However, several varieties were identified: Aladasturi, Lady's finger, Utsiptso, Gizhana.

Here also should be mentioned, that for making alcoholic beverages (vodka) the local population uses mainly fruits of *Pyrus communis* subsp. *caucasica* (Fed.) Browicz., *Prunus domestica* L., *Prunus divaricata* Ledeb., *Cornus mas* L.. The fruits of *Sambucus ebulus* L. are also rarely used.

It should be noted that the local population consumes the fruits of wild and cultural woody plants both in fresh and dried forms.

The list of cultural woody plants recorded in the private plots of the local population is given in the form of a table (Table 3).

**Table 3** Cultural woody plant used for food

Species	Family	Local (transliteration) Name	Plant used part
<i>Cornus mas</i> L.	<i>Cornaceae</i>	Shindi	fruit
<i>Corylus avellana</i> L.	<i>Corylaceae</i>	Tkhili	fruit
<i>Cydonia oblonga</i> Mill.	<i>Rosaceae</i>	K'omshi	fruit
<i>Diospyros kaki</i> L. f.	<i>Ebenaceae</i>	K'araliok'i	fruit
<i>Diospyros lotus</i> L.	<i>Ebenaceae</i>	Chveulebrivi khurma	fruit

<i>Ficus carica</i> L.	<i>Moraceae</i>	Leghvi	fruit
<i>Juglans regia</i> L.	<i>Juglandaceae</i>	K'ak'ali	fruit
<i>Malus domestica</i> (Suckow) Borkh.	<i>Rosaceae</i>	Vashli	fruit
<i>Morus alba</i> L.	<i>Moraceae</i>	Tuta	fruit
<i>Prunus persica</i> (L.) Batsch ( <i>Persica vulgaris</i> Mill.)	<i>Rosaceae</i>	At'ami	fruit
<i>Prunus armeniaca</i> L.	<i>Rosaceae</i>	Ch'erami	fruit
<i>Prunus avium</i> (L.) L.	<i>Rosaceae</i>	Bali	fruit
<i>Prunus cerasus</i> L.	<i>Rosaceae</i>	Alubali	fruit
<i>Prunus divaricata</i> Ledeb. ( <i>Prunus cerasifera</i> Ehrh.)	<i>Rosaceae</i>	T'q'emali	fruit
<i>Prunus domestica</i> L.	<i>Rosaceae</i>	Kliavi	fruit
<i>Prunus domestica</i> subsp. <i>insititia</i> (L.) Bonnier & Layens ( <i>Prunus insititia</i> L.)	<i>Rosaceae</i>	Ghognasho	fruit
<i>Prunus vachuschtii</i> Bregadze	<i>Rosaceae</i>	Alucha	fruit
<i>Punica granatum</i> L.	<i>Lythraceae</i>	Brots'euli	fruit (seed)
<i>Pyrus communis</i> L.	<i>Rosaceae</i>	Mskhali)	fruit
<i>Vitis vinifera</i> L.	<i>Vitaceae</i>	Vazi, q'urdzeni	fruit

In the studied communities the process of genetic erosion of aboriginal varieties of plants is expressed. However, it should be noted, that compared to other crops, local varieties of fruit trees have survived to a greater extent, while vegetables and grain crops have been almost completely replaced by the foreign varieties. This process dates back to the Soviet period, when traditional local agriculture was uprooted and adjusted to Soviet requirements. Old traditional cultures were replaced by high-yielding crops such as corn, beans and potatoes. The focus was on widely spread species, which are far inferior to the aboriginal varieties in terms of taste and nutritional value. Unfortunately, due to the circumstances taking place in Georgia during the last 30 years this process has been deepened.

According to what the population points out, one of the reasons for the genetic erosion of the ancient aboriginal species is the demographic decline in this region (some mountain villages are abandoned, or only 2-3 families live there) and the lack of economic conditions and modern infrastructure. The majority of the population of the villages is made up by the elderly people, and the youth living in the village are less interested in agricultural crops, especially in local cultivated plant varieties and their wild ancestors.

One example of the erosion of local varieties is the famous local tomato variety - Choporti tomato, which is very rare today.

Although the local population mainly consumes herbaceous and cultural crops grown in their private plots, they also gather wild growing plants for food purposes. The assortment of these plants is not small. 13 species of herbaceous and 14 species of woody plants used for different purposes were identified (Table 4).

**Table 4** Wild plants used for food

Scientific name	Family	Local Name (transliteration)	Plant part used
Herbaceous plants			
<i>Allium ursinum</i> L.	<i>Amaryllidaceae</i>	Ghandzili	leave
<i>Amaranthus retroflexus</i> L.	<i>Amaranthaceae</i>	Jijlaq'a	leave
<i>Anthriscus sylvestris</i> (L.) Hoffm.	<i>Apiaceae</i>	Ch'q'ima	leave

<i>Asparagus officinalis</i> L.	<i>Asparagaceae</i>	Sat'atsuri	stem
<i>Chenopodium album</i> L.	<i>Amaranthaceae</i>	Natsarkatama	leave
<i>Lamium album</i> L.	<i>Lamiaceae</i>	Jinch'ris deda	leave
<i>Malva silvestris</i> L.	<i>Malvaceae</i>	Balba	leave
<i>Papaver arenarium</i> M. Bieb.	<i>Papaveeraceae</i>	Q'aq'acho	leave
<i>Portulaca oleracea</i> L.	<i>Portulacaceae</i>	Danduri	Leave, stem
<i>Rumex acetosa</i> L.	<i>Polygonaceae</i>	Mjhauna	leave
<i>Rumex crispus</i> L.	<i>Polygonaceae</i>	Gholo	leave
<i>Taraxacum officinale</i> F.H. Wigg.	<i>Astraceae</i>	Babuats'vera	leave
<i>Urtica dioica</i> L.	<i>Urticaceae</i>	Ch'incha'ri	Leave, stem
Woody plants			
<i>Berberis vulgaris</i> L.	<i>Berberidaceae</i>	K'ots'akhuri	fruit
<i>Cornus mas</i> L.	<i>Cornaceae</i>	Shindi	fruit
<i>Corylus avellana</i> L.	<i>Corylaceae</i>	tkhili	fruit
<i>Crataegus kyrstostyla</i> Fingerh.	<i>Rosaceae</i>	Ts'iteli k'uneli	fruit
<i>Crataegus pentagyna</i> Waldst. Kit. ex Willd.	<i>Rosaceae</i>	Shavi k'uneli	fruit
<i>Elaeagnus angustifolia</i> L.	<i>Elaeagnaceae</i>	Pshat'i	fruit
<i>Hippophae rhamnoides</i> L.	<i>Elaeagnaceae</i>	Katsvi	fruit
<i>Malus orientalis</i> Uglitzk. [ <i>Malus sylvestris</i> subsp. <i>orientalis</i> (Uglitzk.) Browicz]	<i>Rosaceae</i>	Majhalo	fruit
<i>Mespilus germanica</i> L. [ <i>Crataegus germanica</i> (L.) Kuntze]	<i>Rosaceae</i>	Zghmart'li	fruit
<i>Prunus spinosa</i> L.	<i>Rosaceae</i>	K'vrinchkhi	fruit
<i>Pyrus communis</i> subsp. <i>caucasica</i> (Fed.) Browicz ( <i>Pyrus caucasica</i> Fed.)	<i>Rosaceae</i>	P'ant'a	fruit
<i>Rosa</i> ssp.	<i>Rosaceae</i>	Ask'ili	fruit
<i>Rubus</i> ssp.	<i>Rosaceae</i>	Maq'vali	fruit
<i>Staphylea pinnata</i> L.	<i>Staphyleaceae</i>	Jonjoli	inflorescence

### 3.2. Medicinal Plants

The local population mainly uses wild plants for medicinal purposes. Among them there are both herbaceous and woody plants (Table 5). However, some medicinal herbs are weeds and grow in homesteads, adjacent areas and roadsides (e.g. *Cichorium intibus* L., *Urtica dioica* L., *Sambucus ebulus* L., *Achillea arabica* Kotschy, *Plantago major* L., *Rubus* ssp.).

**Table 5** Medicinal wild plants

Species	Family	Local Name (transliteration)	Plant part used
Herbaceous plants			
<i>Achillea arabica</i> Kotschy	<i>Asteraceae</i>	Melik'uda, parsmanduk'i	Leave, stem, flower

<i>Achillea nobilis</i> subsp. <i>neilreichii</i> (A. Kern.) Velen.	<i>Asteraceae</i>	Melik'uda, parsmanduk'i	Leaf, stem, flower
<i>Chelidonium majus</i> L.	<i>Papaveraceae</i>	Kristesiskhla	Leaf, stem
<i>Cichorium intybus</i> L.	<i>Asteraceae</i>	Vardk'ach'ach'a	Leaf, stem, flower
<i>Clinopodium grandiflorum</i> (L.) Kuntze	<i>Lamiaceae</i>	Mtis p'it'na	Leaf, stem
<i>Hypericum perforatum</i> L.	<i>Hypericaceae</i>	K'razana	Leaf, stem, flower
<i>Plantago major</i> L.	<i>Plantaginaceae</i>	Mravaldzarghva	Leaf
<i>Polygonum carneum</i> K. Koch [ <i>Bistorta carnea</i> (K. Koch) Kom.]	<i>Polygonaceae</i>	Mat'it'ela	Leaf
<i>Polypodium vulgare</i> L.	<i>Polypodiaceae</i>	K'ilamura	Leaf
<i>Sambucus ebulus</i> L.	<i>Viburnaceae</i>	Ants'li	leaf
<i>Pheidimus stolonifera</i> (S.G.Gmel) 't Hart ( <i>Sedum stoloniferum</i> S.G.Gmel)	<i>Crassulaceae</i>	K'ldisduma, msukana	leaf
<i>Urtica dioica</i> L.	<i>Urticaceae</i>	Ch'inch'ari	Leaf, stem
<i>Ziziphora clinopodioides</i> Lam. subsp. <i>clinopodioides</i> ( <i>Ziziphora serpyllacea</i> M. Bieb.)	<i>Lamiaceae</i>	Urtsi	Leaf, stem, flower
Woody plants			
<i>Berberis vulgaris</i> L.	<i>Berberidaceae</i>	K'ots'akhuri	fruit
<i>Cornus mas</i> L.	<i>Cornaceae</i>	Shindi	fruit
<i>Crataegus kyrtostyla</i> Fingerh.	<i>Rosaceae</i>	Ts'iteli k'uneli	fruit
<i>Crataegus pentagyna</i> Waldst. Kit. ex Willd.	<i>Rosaceae</i>	Shavi k'uneli	fruit
<i>Elaeagnus angustifolia</i> L.	<i>Elaeagnaceae</i>	Pshat'i	fruit
<i>Hippophae rhamnoides</i> L.	<i>Elaeagnaceae</i>	Katsvi	fruit
<i>Prunus divaricata</i> Ledeb. ( <i>Prunus cerasifera</i> Ehrh.)	<i>Rosaceae</i>	T'q'emali	fruit
<i>Prunus spinosa</i> L.	<i>Rosaceae</i>	K'vrinchkhi	fruit
<i>Pyrus communis</i> subsp. <i>caucasica</i> (Fed.) Browicz ( <i>Pyrus caucasica</i> Fed.)	<i>Rosaceae</i>	P'ant'a	fruit
<i>Quercus petraea</i> subsp. <i>iberica</i> (Steven ex M. Bieb.) Krassiln.	<i>Fagaceae</i>	Mukha	bark
<i>Rosa</i> ssp.	<i>Rosaceae</i>	Ask'ili	fruit
<i>Rubus</i> ssp.	<i>Rosaceae</i>	Maq'vali	fruit
<i>Staphylea pinnata</i> L.	<i>Staphyleaceae</i>	Jonjoli	inflorescence

The range of cultivated plants used for medicinal purposes is relatively small (Table 6).

**Table 6** Cultivated plants used for medicinal purposes

Species	Family	Local (transliteration)	Name	Plant used	part
Herbaceous plants					
<i>Anethum graveolens</i> L.	<i>Apiaceae</i>	K'ama		leave, seed	stem,
<i>Apium graveolens</i> L.	<i>Apiaceae</i>	Niakhuri		root	
<i>Coriandrum sativum</i> L.	<i>Apiaceae</i>	Kindzi		seed	
<i>Cucurbita pepo</i> L.	<i>Cucurbitaceae</i>	Gogra		fruit, seed	
Woody plants					
<i>Cornus mas</i> L.	<i>Cornaceae</i>	Shindi		fruit	
<i>Cydonia oblonga</i> Mill.	<i>Rosaceae</i>	K'omshi		fruit	
<i>Prunus divaricata</i> Ledeb. ( <i>Prunus cerasifera</i> Ehrh.)	<i>Rosaceae</i>	T'q'emali		fruit	

The local population keeps medicinal plants in dried form and consumes them at different times of the year.

The information collected in different villages about medicinal properties of plants and their usage is almost identical to each other. This proves that over the centuries, medicinal treatment with plants has become part of the cultural heritage of the local population.

#### 4. Conclusion

The research revealed that the use of plants for various purposes in the studied region has deep historical roots. The range of plants used both for food and medicine is diverse. Local and endemic woody plant varieties are still preserved among the cultural plants, while herbaceous cultural plants are represented almost entirely by non-local species and varieties.

The local population still has well-preserved traditions of preparing, storing and using both cultural and wild edible plants.

Erosion of local varieties is related to various factors:

- Import and distribution of high-yielding foreign varieties;
- Extremely reduced interest in traditional aboriginal and endemic species and varieties among the population;
- Abandoning the villages caused by the migration processes of the local population;
- Proximity to the central city of the municipality (Dusheti) and Tbilisi, the capital of Georgia, having a significant impact on the life of the local population.

Despite of the widely developed pharmacy network in the country, the local population still uses both cultivated and wildy grown plants for medical purposes. This tradition is passed down from generation to generation.

#### Compliance with ethical standards

##### *Disclosure of conflict of interest*

There is no conflict with the research and data presented in the article.

##### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.



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