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RESEARCH ARTICLE

# An ethnobotanical survey of the Gollak region, Kosovo

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**Abstract** An ethnobotanical field study focused on traditional uses of medicinal plants, wild food plants, and mushrooms was conducted in 37 villages in the Gollak region of eastern Kosovo. Interviews with 66 elderly informants were conducted using standard ethnobotanical methods. The uses of 92 vascular plants and 6 mushrooms species belonging to 47 different families were recorded. Mainly infusions and decoctions were quoted as folk medicinal preparations and the most commonly quoted plant medicinal uses referred to diseases of the respiratory system, skin, and gastrointestinal tract. Comparison of the collected data with the ethnobotanical findings of previously conducted studies in the surrounding Western Balkan areas showed that, even if more than the half of Gollak's wild botanical genera quoted as medicines used are the same in Serbia and in Northern Albania, commonalities between the actual medicinal plant applications recorded in the present study and those reported for the other areas are extremely scarce. This may confirm the richness of the bio-cultural heritage of the Western Balkan region and the urgent need to conduct cross-cultural comparative field ethnobiological studies.

**Keywords** Albanians · Ethnobotany · Gollak · Kosovo · Medicinal plants

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## Introduction

In recent years, the Western Balkans have been the focus of an increasing number of field ethnobotanical studies (in Croatia: Pieroni et al. 2003 and Pieroni and Giusti 2008; in Bosnia and Herzegovina: Redžić 2006, 2007; Šarić-Kundalić et al. 2010a, b, 2011; in Serbia: Milojević 1988; Jarić et al. 2007; Pieroni et al. 2011; in Montenegro: Menković et al. 2011; in Albania: Pieroni et al. 2005; Pieroni 2008, 2010). This has happened for various reasons: the interest of the Western herbal market, which is partly dominated by medicinal plants traded from this area (Lange 1998; Kathe et al. 2003); the need for documenting the last remaining traces of Traditional Knowledge in areas, which—also because of their recent political histories—have been often labelled as "marginal" and/or even "isolated" in Europe; the increasing economic trends in these countries to develop eco-

tourism and other sustainable rural activities based upon local bio-cultural heritage; and finally, the fact that this area is also considered to be crucial by ethnobiologists as a unique case study for its tremendous biological and cultural/ethnic diversity.

Nevertheless, not much has been done so far in European terms of cross-cultural comparative ethnobotanical studies (Leporatti and Ivancheva 2003; Pieroni and Quave 2005; Pieroni et al. 2006; Ghirardini et al. 2007; Pardo-de-Santayana et al. 2007; Hadjichambis et al. 2008; González-Tejero et al. 2008; Leporatti and Ghedira 2009; Pieroni et al. 2011) and/or studies, which consider also historical or folkloric sources on herbal or wild food plant uses (Pieroni 2000; Łuczaj 2008, 2010a, b; Pollio et al. 2008; De Natale et al. 2009; Gentili et al. 2009; Leonti et al. 2009, 2010; Péntek and Szabó 1985; Tagarelli et al. 2010).

In Kosovo, apart from a review on botanical folk names in diverse Albanian-speaking areas in South-Eastern and Southern Europe (Sejdiu 1984), no proper ethnobotanical investigations have been conducted thus far. On the other hand, Kosovo retains a great biological, ecological and landscape diversity. There are currently around 1,800 plant species known to make up the flora of Kosovo, and these are deposited at the Herbarium of the Faculty of Mathematical and Natural Science of the University of Prishtina. About 200 species that occur in Kosovo are Balkan endemics, while 13 are specific Kosovo endemics (Krasniqi 1998). However, the actual total flora of Kosovo is estimated to comprise more than 2,500 plant species (Krasniqi 1998), which accounts for about 30% of the entire Balkan flora and 16% of the European flora, although Kosovo covers only 2.3% of the Balkan land area (Mustafa 1998).

The Gollak region is a mountainous area located in the eastern part of Kosovo (Fig. 1) with several isolated villages and it is rich in plant biodiversity (Krasniqi 1982, 1998; Rexhepi 1994; Mustafa 1998). It is for this reason that we selected this area for an ethnobotanical study focused on wild food and medicinal plant uses.

The Gollak is dominated by forests and pastures, with altitudes ranging from 800 to 1,260 m a.s.l. (Çavolli 1997). The climate is influenced by continental air masses; for this reason, it has cold winters and hot summers. The average temperature is 12.6°C, whereas the average temperature under zero is −5.8°C. This area is characterised by total annual precipitation of 667 mm per year.

Climate, geological and soil composition diversity provide an interesting source of diversity of flora and vegetation of this region. Since the flora of Kosovo belongs in different biogeographic zones (Eurosiberic; North American region; Mediterranean and Alpine-Nordic regions), the mountainous terrain contributes to a great diversity in flora (Mustafa 1998). Differences in altitude and diversity of other ecological factors have supported the establishment of different vegetation zones on its vertical profile dominated by forest plant communities: *Quercetum farnetto-cerris scardicum, Querceto-Carpinetum orientalis, Quercetum montanum* and *Fagetum moesiacae montanum* (Krasniqi 1972), and herbaceous plant community: *Trifolio festucetum vallesiaceae* and *Inulo danthonietum alpinae* (Rexhepi 1994).

This region has been inhabited since ancient times. The native residents are ethnic Albanians, who speak Gegë varieties of the Albanian language. The exact population is currently unknown, as no population census has been conducted in Kosovo since 1981. Recently, the area has been badly affected by migration, due to displacement and a harsh economic climate that impacts the local residents' ability to subsist.

The aims of this study were twofold: (1) to document all of the ethnobotanical knowledge related to the use of plants in local folk medical practices and of wild plants in the diet and (2) to compare the resulting data with the few field ethnobotanical studies carried out in recent years in Serbia, Montenegro, and Albania.

## Methodology

### Field study

Field research was conducted from May to October 2009. Traditional botanical knowledge was recorded using interviews and an administrated questionnaire. In particular, we sought the following information:

- respondent name and the location;
- local botanical names;
- plant part(s) used;
- local preparation/administration;
- local folk medicinal and/or food uses.

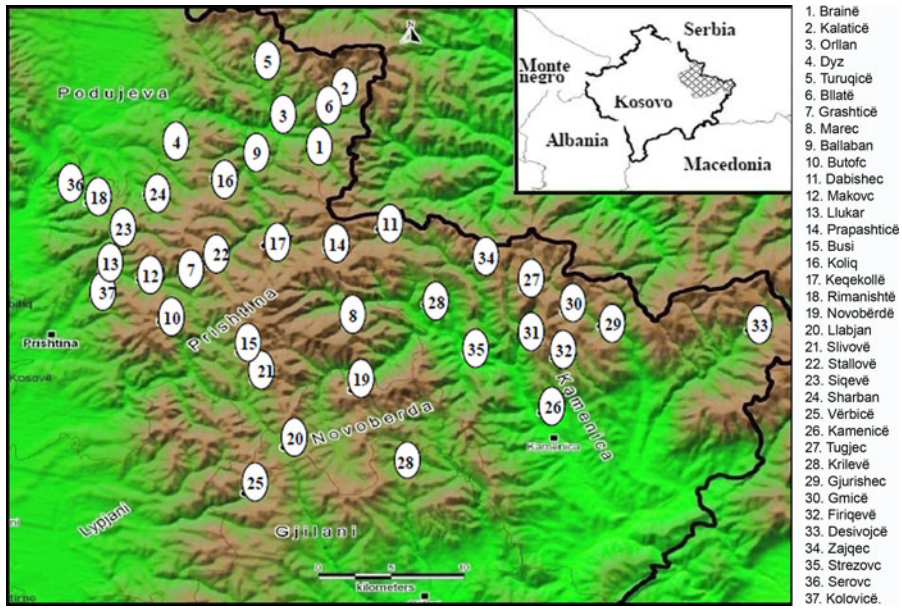


**Fig. 1** Map of the study area

Data were collected from 66 informants (30 male and 36 female) older than 50 years, living in 37 villages (Fig. 1) belonging to five municipalities (Prishtina, Podujeva, Kamenica, Gjilan and Novo Bërd), and who are mainly engaged in agricultural activities. The participants were selected using the snowball sampling method (Bernard 2002), and was particularly focused on people who regularly use plants for medicinal purposes. Prior informed consent was obtained prior to conducting interviews and researchers adhered to the ethical guidelines of the International Society of Ethnobiology (ISE 2006). In most cases, informants had inherited their ethnobotanical knowledge from their direct ancestors (parents, grandparents). During the interviews, fresh plants were collected to create voucher specimens for the herbarium and the informants were followed into the field to show us the quoted species. Most plant species were collected while in flower. Taxonomic identification was conducted by Dr. Qazim Pajazita, through use of the relevant standard botanical literature of the area, such as Paparisto et al. (1988–2000) and Jordanov (1963–1979). Plant nomenclature largely follows the *Flora Europaea* (Tutin et al. 1964). Plant family assignments follow the current Angiosperm Phylogeny Group guidelines (Stevens 2011). Voucher specimens of the wild taxa were deposited at the Department of Biology (Herbarium code GO/09), University of Prishtina.

### Data analysis

A consensus index, based on the frequency of citation by the different study participants, was created and is reported in Table 1.

Despite the fact that is always problematic to compare ethnobotanical data coming from studies conducted via very different field methods and at different times, we also attempted to compare the wild medical plant uses recorded in Gollak with those recorded in previously conducted ethnobotanical studies in surrounding Western Balkan areas (Fig. 2): (Milojević 1988; Jarić et al. 2007; Pieroni et al. 2005, 2011; Pieroni 2007; Menković et al. 2011).

## Results and discussion

### Gallak's wild food and medicinal plant uses

The results of the field survey are presented in Table 1; plants are arranged in alphabetical order by genus. For each species, the botanical name and family, local names, English name, botanical status, preparation/administration and folk medical or food uses are presented. We found that 98 taxa (belonging to 47 families) are employed in the traditional foods and medicines of the area. This includes six

**Table 1** Medicinal plant and wild food botanical and mushroom uses recorded in the Gollak region

| Botanical taxon, botanical family and voucher specimen code | Albanian folk name(s) | English name | Status | Quotation frequency | Part(s) used | Administration | Treated disease(s) or medical/food uses(s) in Gollak |
|---|---|---|---|---|---|---|---|
| *Achillea millefolium* L. (Asteraceae) 79/GO/09 | Barëpezmi<br>Bari për pezmatim<br>Lule e bardhë | Yarrow | W | ++ | Flowering aerial parts | Decoction | Fever<br>Stomach disorders<br>Hepatic disorders |
| | | | | | Flowers | Decoction, externally | Skin irritations<br>Acnes |
| | | | | | Leaves | Fresh leaves, topically applied | Wounds |
| *Aesculus hippocastanum* L. (Sapindaceae) 29/GO/09 | Gështenja e egër | Horse chestnut | W | + | Fruits | Decoction, drunk for one week | Anti-haemorrhoidal |
| *Agaricus* sp. (Agaricaceae) | "Lisiqarka", Shampinjone | Meadow mushrooms | W/C | ++ | Fruiting body | Consumed | Food and seasoning |
| *Allium cepa* L. (Alliaceae) | Qepa | Onion | C | +++ | Bulb | Boiled with soap and after cooling applied on the nail | Nail infections |
| | | | | | | Decoction of onion bulbs mixed with squeezed lemons | Antitussive |
| | | | | | | Decoction | Sore throat<br>Antitussive |
| | | | | | | Boiled in milk | Antitussive |
| *Allium porrum* L. (Alliaceae) | Purrini,<br>Presh | Garden leek | C | ++ | Leaf juice | Drunk | Anti-diabetic |
| *Allium sativum* L. (Alliaceae) | Hudhëra,<br>Hudra | Garlic | C | ++ | Bulb | Rubbed on the warts | To treat the warts |
| | | | | | | | Ear-ache |
| | | | | | | Bulb juice applied into the ear | |
| | | | | | | Eaten fresh | Anti-hypertensive |
| | | | | | | Boiled in milk (4–5 cloves) and drunk as tea | To "disinfect" the intestine |
| *Allium* sp.(Alliaceae) 36/GO/09 | Hudra e egër<br>Hudhëra e egër | Wild garlic | W | + | Leaves | Eaten fresh | Anti-anaemic |
| *Amanita cesarea* (Fr.) Pers. (Amanitaceae) | Kërpudhat patligjane | Caeser's mushroom | W | + | Fruiting body | Consumed | Food<br>Seasoning |

**Table 1** continued

| Botanical taxon, botanical family and voucher specimen code | Albanian folk name(s) | English name | Status | Quotation frequency | Part(s) used | Administration | Treated disease(s) or medical/food uses(s) in Gollak |
|---|---|---|---|---|---|---|---|
| *Armoracia rusticana* Gaertn., Mey. et Scherb. | Bari për gji | Horseradish | W | + | Leaves | Applied on the breast during the night | Breast oedema |
| (Brassicaceae) 68/GO/09 | | | | | | Fresh leaves topically applied on the wounds | Breast and skin inflammations |
| *Artemisia absinthium* L. (Asteraceae) 78/GO/09 | Fshisa, Pelini | Wormwood | W | + | Flowers | Infusion | Expectorant<br>Appetizing |
| *Artemisia annua* L. (Asteraceae) 80/GO/09 | Bajsilegu | Sweet wormwood | W | + | Whole plant | Decoction | Nail infection |
| *Bellis perennis* L. (Asteraceae) 94/GO/09 | Lulet e bardha | Common daisy | W | + | Whole plants | Decoction | Skin infection |
| *Betula pendula* Roth. (Betulaceae) 94/GO/09 | Mështekna | Silver birch | W | + | Bark | Infusion | Lithontriptic |
| *Boletus edulis* Bull. (Boletaceae) | Kërpudhat vergan | Porcini mushroom | W | + | Fruiting body | Consumed | Food<br>Appetizing<br>Seasoning |
| *Bryonia* sp. (Cucurbitaceae) 64/GO/09 | Kungëlli i egër | Bryony | W | + | Root juice | Squeezed and topically applied to the painful area | Anti-rheumatic |
| *Cantharellus cibarius* Fr. (Cantharellaceae) | Kërpudhat e dhelprës | Chanterelle | W | + | Fruiting body | Consumed | Food<br>Seasoning |
| *Centaurium erythraea* Rafn. (Gentianaceae) 07/GO/09 | Bari i etheve | Common centaury | W | + | Flowering aerial parts | Infusion | Fever |
| *Chelidonium majus* L. (Papaveraceae) 96/GO/09 | Latrapeci | Tetterwort | W | + | Latex | Topically applied or ingested | Warts<br>Liver disorders |
| *Cichorium intybus* L. (Asteraceae) 83/GO/09 | Çikoreja | Common chicory | W | + | Root | Infusion | Hart disorders<br>Atherosclerosis |
| *Citrus* limon Burm. f. (Rutaceae) 27/GO/09 | Limoni | Lemon | C | ++ | Fruit juice<br>Fruits | Mixed with olive and ingested | Kidney stones |
| | | | | | | Lemon (1 kg), honey(1 kg), walnut (1/2 kg) and garlic mixed and eaten | Respiratory inflammations |
| | | | | | | Topically applied | Oedemas |

**Table 1** continued

| Botanical taxon, botanical family and voucher specimen code | Albanian folk name(s) | English name | Status | Quotation frequency | Part(s) used | Administration | Treated disease(s) or medical/food uses(s) in Gollak |
|---|---|---|---|---|---|---|---|
| *Conium maculatum* L. (Apiaceae) 37/GO/09 | Kakuda | Hemlock | W | + | Roots | Boiled in milk | Anti ulcers |
| *Cornus mas* L. (Cornaceae) 35/GO/09 | Thana | Dogwood | W | +++ | Fruits | Decoction | Anti-diarrhoeal |
| | | | | | | Infusion | To improve the blood circulation Anti-hypertensive |
| | | | | | | | Anti-diarrhoeal |
| | | | | | | | Anti-diabetic |
| | | | | | Bark | Decoction | Anti eczema |
| | | | | | Fruits | Decoction | Anti haemorrhoid |
| *Corylus avellana* L. (Betulaceae) 15/GO/09 | Lajthia | Hazel | W | ++ | Fruits | Eaten | Anti-diarrhoeal |
| | | | | | | Mixed with honey | Aphrodisiac |
| | | | | | Leaves | Infusion | Anti-diabetic |
| | | | | | | | Anti-anaemic |
| *Crataegus monogyna* Jacq. (Rosaceae) 48/GO/09 | Murrizi | Oneseed hawthorn | W | +++ | Flowers | Infusion | Neuro-relaxant |
| | | | | | Fruits | Infusion | Anti-hypertensive |
| | | | | | | | Anti-diabetic |
| | | | | | | | Heart pulse regulator |
| | | | | | | | Vasoconstrictor |
| | | | | | | | Used to treat fever |
| *Cucurbita pepo* L. (Cucurbitaceae) 66/GO/09 | Kungulli | Pumpkin | C | | Fruits | Boiled in milk, applied externally placed in neck | Parotitis |
| | | | | | Fruit juice | Drunk | Stomach inflammations |
| | | | | | Leaves | Infusion | Sour throat |
| | | | | | | | Antitussive |
| | | | | | | | Kidney inflammations |
| | | | | | | | Intestine infections |
| | | | | | | | Anti-diarrhoeal |
| *Dipsacus fullonum* L. (Dipsacaceae) 39/GO/09 | Bari për hemoroide | Teasel | W | + | Flowers | Infusion | Anti-haemorrhoid |
| *Equisetum arvense* L. (Equisetaceae) 40/GO/09 | Hithecaku, Bishtmini | Horsetail | W | ++ | Aerial parts | Macerated plant, topically applied | Anti-rheumatic |

**Table 1** continued

| Botanical taxon, botanical family and voucher specimen code | Albanian folk name(s) | English name | Status | Quotation frequency | Part(s) used | Administration | Treated disease(s) or medical/food uses(s) in Gollak |
|---|---|---|---|---|---|---|---|
| *Euphorbia amygdaloides* L. (Euphorbiaceae) 19/GO/09 | Bari për kimzi<br>Tamelqoku | Wood spurge | W | + | Whole plant | Fresh plant mixed with honey and milk cream, extracted for 1 week | Nail infections |
| *Euphorbia cyparissias* L. (Euphorbiaceae) 18/GO/09 | Tamëlqoku | Cypress spurge | W | + | Latex | Latex placed directly in warts | Warts |
| *Fragaria vesca* L. (Rosaceae) 47/GO/09 | Dredh. e egra<br>Dredhëza mali | Strawberry | W | +++ | Aerial parts | Mixed with honey, ingested | Heart disorders |
| *Gentiana cruciata* L. (Gentianaceae) 08/GO/09 | Bari për kimzi | Star gentian | W | + | Flowering aerial parts | Mixed with honey and a small amount of copper sulphate, topically applied | Nail infections |
| *Geranium lucidum* L. (Geraniaceae) 97/GO/09 | Bari për skuqje të këmbëve | Shining cranesbill | W | + | Whole plants | Macerated and mixed with olive oil, then topically applied | Eczema |
| *Geum urbanum* L. (Rosaceae) 60/GO/09 | Shtrënguesi | Wood avens | W | + | Roots | Infusion | Anti-haemorrhoid |
| *Handkea utriformis* (Bull.) Kreisel (Lycoperdaceae) | Pufkat | Mosaic puffball | W | + | Fruiting body | Topically applied to the wound | Haemostatic |
| *Hedera helix* L. (Araliaceae) 41/GO/09 | Hedera | Ivy | W | + | Leaves | Tincture | Warts |
| *Helianthus tuberosus* L. (Asteraceae) 82/GO/09 | Mollë e dheut | Sunroot | W | + | Tubers | Boiled in milk, externally applied or eaten | Wounds<br>Anti-diabetic |
| *Hieracium* sp. (Asteraceae) 81/GO/09 | Bari i majasilit të lëkurës | Hawkweed | W | + | Whole plant | Fresh plant mixed with cream milk and honey, topically applied | Eczema |

**Table 1** continued

| Botanical taxon, botanical family and voucher specimen code | Albanian folk name(s) | English name | Status | Quotation frequency | Part(s) used | Administration | Treated disease(s) or medical/food uses(s) in Gollak |
|---|---|---|---|---|---|---|---|
| *Hypericum perforatum* L. (Hypericaceae) 32/GO/09 | Balsami<br>Bari i zojave<br>Kantarioni<br>Lulë balsami | St. John's wort | W | +++ | Flowers | Infusion | Stomach disorders<br>Genital infections |
| | | | | | Aerial parts | Infusion | Urinary system infections<br>Stomach disorders<br>Anti-diabetic |
| | | | | | | Mixed with olive oil, used after 40 days, topically applied | Anti-haemorrhoid |
| *Juglans regia* L. (Juglandaceae) 22/GO/09 | Arra | Common walnut | C | ++ | Fruits | Fruit cortex, topically applied | Warts |
| | | | | | Leaves | Infusion | Anticholesterolemic<br>Anti diabetic |
| | | | | | | Tincture | Anti-rheumatic |
| *Juniperus communis* L. (Cupressaceae). 12/GO/09 | Gllija, Kllija | Juniper | W | ++ | Cones | Mixed with thyme, chamomile and St. John's Wort and olive oil | Sinusitis<br>Anti-asthmatic<br>Kidney pain |
| | | | | | Cones and young branches | Infusion | Lithontriptic<br>Menstrual pains |
| *Lactarius deliciosus* (L.) S.F. Gray(Russulaceae) | Kërpudhat e vjeshtës | Saffron milk cap | | + | Fruiting body | Consumed | Food<br>Seasoning |
| *Lagenaria siceraria* (Molina) Standl. (Cucurbitaceae) 65/GO/09 | Pocërrka | Bottle gourd | W | + | Fruits | Fruits opened and filled with water and then water used to flush the nose | Sinusitis |
| *Ligustrum vulgare* L. (Oleaceae) 10/GO/09 | Shemëshir | Common Privet | W/C | + | Stem, leaves | Decoction | Lithontriptic |
| *Lycopersicon esculentum* L. (Solanaceae) | Patligjani Domatja | Tomato | W | ++ | Fruit | Topically applied | Skin inflammation and ulcers |
| *Malus dasyphylla* Borkh. (Rosaceae) | Mollat e ëmbëla<br>Mollat verore | Apple | C | ++ | Fruit | Decoction | Anti-diarrhoeal<br>Anti-constipation |

**Table 1** continued

| Botanical taxon, botanical family and voucher specimen code | Albanian folk name(s) | English name | Status | Quotation frequency | Part(s) used | Administration | Treated disease(s) or medical/food uses(s) in Gollak |
|---|---|---|---|---|---|---|---|
| *Malus sylvestris* Mill. (Rosaceae) 59/GO/09 | Molla e egër | European wild apple | W | +++ | Fruit | Squeezed, externally applied | Warts |
| | | | | | | 2–3 drops of fruit juice applied in ear | Earache |
| | | | | | | Decoction | Headache |
| | | | | | | Infusion | Anti hypertensive |
| | | | | | | | Anti-diarrhoeal |
| | | | | | Flowering areal parts | Infusion | Mucolithic |
| *Malva sylvestris* L. (Malvaceae) 90/GO/09 | Mëllaga | Common mallow | W | + | Leaves and flowers | Infusion | Mucolithic |
| *Matricaria chamomilla* L. (Asteraceae) 99/GO/09 | Kamomila Kamelicë | Chamomile | W | +++ | Flowering areal parts | Decoction | Sinusitis |
| | | | | | | | Stomach pain |
| | | | | | | | Skin spots |
| | | | | | | | Anti rheumatic |
| | | | | | Leaves | Boiled in milk, applied in neck | Tonsillitis |
| *Morus nigra* L. (Moraceae) 01/GO/09 | "Dudi i zi" | Black mulberry | C | + | Leaves | Infusion | Anti diabetic |
| | | | | | Fruit juice | Eaten | Oral mucusal inflammation |
| *Ononis spinosa* L. (Fabaceae) 61/GO/09 | Therrë lepuri | Spiny rest harrow | W | + | Flowers | Infusion | Anti-diabetic |
| | | | | | | | Renal disorders |
| | | | | | | | Lithonthopic |
| *Orchis morio* L. (Orchidaceae). 24/GO/09 | Salepi | Wilde orchid | W | + | Tuber | Infusion | Anti-diarrheoal |
| *Origanum vulgare* L. (Lamiaceae) 74/GO/09 | Çaj mali, Rigoni | Oregano | W | +++ | Flowering aerial parts | Infusion | Sedative |
| *Papaver rhoeas* L. (Papaveraceae) 14/GO/09 | Lulëkuqja | Red poppy | W | + | Flowers | Infusion | Insomnia |
| | | | | | | | Antitussive |
| *Pelargonium zonale* L. (Geraniaceae) 17/GO/09 | Lule sardani | Garden geranium | W | + | Stem | Placed directly in rectum | Constipation |
| *Pyrus pyraster* (L.)Burgsd. (Rosaceae) 45/GO/09 | Dardha e egër | Wild pear | W | ++ | Fruits | Decoction | Constipation |

**Table 1** continued

| Botanical taxon, botanical family and voucher specimen code | Albanian folk name(s) | English name | Status | Quotation frequency | Part(s) used | Administration | Treated disease(s) or medical/food uses(s) in Gollak |
|---|---|---|---|---|---|---|---|
| *Plantago lanceolata* L. (Plantaginaceae) 03/GO/09 | Dejzi me gjethe të ngushta | Narrowleaf plantain | W | + | Leaves | Fresh leaves are topically applied | Skin inflammations |
| | | | | | | Boiled with soap and topically applied | Nail infection |
| *Plantago major* L. (Plantaginaceae) 04/GO/09 | Bari me dejzi, Bari me fije, Dejzi femror | Common plantain | W | +++ | Leaves | Mixed with milk cream, topically applied | Nail infections<br>Skin ulcers |
| | | | | | | Infusion | Urogenital infections |
| | | | | | | Fresh leaves, topically applied | Anti-venom |
| | | | | | | Macerated fresh leaves, topically applied in breast | Stimulating lactation |
| *Polygonum bistorta* L. (Polygonaceae) 69/GO/09 | Ufllat e leprit | Meadow bistort | W | + | Flowering aerial parts | Consumed | Pite (pie) stuffing |
| *Populus nigra* L. (Salicaceae) 16/GO/09 | Plepi | Lombardy poplar | W | + | Leaves | Infusion | Anti tuberculosis |
| *Primula veris* Huds. (Primulaceae) 30/GO/09 | Aguliçja | Cowslip | W | ++ | Flowers | Infusion | Antitussive |
| *Prunus cerasifera* Ehrh. (Rosaceae) 51/GO/09 | Kojsi e egër, Kajsi | Cherry plum | W | + | Fruits | Consumed | Eaten raw |
| *Prunus cerasus* L. (Rosaceae) 54/GO/09 | Vishnjet | Sour cherry | C | +++ | Fruits | Decoction | Antihypertensive |
| *Prunus persica* (L.) Batsch. (Rosaceae) 45/GO/09 | Zerzelia<br>Pjeshka | Peach | C | +++ | Unripe fruits | Decoction | Anti-diabetic |
| *Prunus spinosa* L. (Rosaceae) 49/GO/09 | Kulumria | Blackthorn | W | ++ | Fruits | Infusion | Antihypertensive<br>Angina pectoris |
| *Quercus cerris* L. (Fagaceae) 98/GO/09 | Qarri | Turkey oak | W | + | Cortex | Boiled and its vapour applied in the back | Sciatica<br>Spinal column pain |
| *Ribes grossularia* L. (Grossulariaceae) 23/GO/09 | Ribizlla | Gooseberry | W | + | Fruits | Fresh fruits | Anti-anemic<br>Eaten raw |

**Table 1** continued

| Botanical taxon, botanical family and voucher specimen code | Albanian folk name(s) | English name | Status | Quotation frequency | Part(s) used | Administration | Treated disease(s) or medical/food uses(s) in Gollak |
|---|---|---|---|---|---|---|---|
| *Robinia pseudacacia* L. (Fabaceae) 62/GO/09 | Bagremi Bagreri | Black locust | W | ++ | Flowering areal parts | Infusion | Respiratory inflammations |
| *Rosa canina* L. (Rosaceae) 50/GO/09 | Kaça | Dog rose | W | ++ | Fruits | Infusion | Lithontriptic<br>Renal pain<br>Sour throat<br>Antitussive<br>Anti-diarrhoeal<br>Used as tea |
| *Rubus caesius* L. (Rosaceae) 44/GO/09 | Manaferra e kaltër | Dewberry | W | ++ | Roots<br>Fruits | Infusion<br>Fresh fruits | Used to treat lung cancer<br>Eaten raw |
| *Rubus fruticosus* L. (Rosaceae) 43/GO/09 | Manat,<br>Mani i malit | Blackberry | W | ++ | Roots<br>Fruits | Decoction<br>Consumed fresh or in jam | Appendicitis<br>Eaten raw or in jams |
| *Rubus idaeus* L. (Rosaceae) | Medra<br>Mjedrra | Raspberry | W | +++ | Fruits | Consumed | Eaten raw |
| *Rumex rugosus* Campd. (Polygonaceae) 72/GO/09 | Ufllat e livadheve | Garden sorrel | W | + | Leaves | Fresh leaves | Anti-diabetic |
| *Rumex acetosella* L. (Polygonaceae) 71/GO/09 | Ufllat e tharpta | Sheep sorrel | W | + | Leaves | Fresh leaves | Pite (pie) stuffing |
| *Rumex crispus* L. (Polygonaceae) 70/GO/09 | Lakër e egra | Curly dock | W | + | Leaves | Fresh leaves | Used to make salad |
| *Sambucus nigra* L. (Caprifoliaceae) 26/GO/09 | Shtogu | Elderberry | W | ++ | Flower<br>Stem | Infusion<br>Boiled with milk cream | Anti asthmatic<br>Appetizing<br>Anti-diarrhoeal<br>Respiratory inflammations<br>(bronchitis)<br>Improving blood circulation<br>Sore throats<br>Skin inflammations<br>Eczemas |
| *Sambucus ebulus* L. (Caprifoliaceae) 28/GO/09 | Kinla | Dwarf elderberry | W | + | Flowers | Decoction | Anti-rheumatic |
| *Sempervivum tectorum* L. (Crassulaceae) 34/GO/09 | Lule veshi | Houseleek | W | + | Leaves juice<br>Leaves | 2–3 drop applied in ear<br>Fresh leaves | Ear-ache<br>Anti-anemic |

**Table 1** continued

| Botanical taxon, botanical family and voucher specimen code | Albanian folk name(s) | English name | Status | Quotation frequency | Part(s) used | Administration | Treated disease(s) or medical/food uses(s) in Gollak |
|---|---|---|---|---|---|---|---|
| *Sinapis arvensis* L. (Brassicaceae) 67/GO/09 | Sinapi<br>Spinaqi i egër | Charlock mustard | W | ++ | Flowering aerial parts | Boiled with milk applied externally to wash the body | Antiparalytic |
| *Solanum tuberosum* L. (Solanaceae) | Patate | Potato | C | + | Tuber | Boiled with milk, applied externally in chest | Fevers |
| *Sorbus torminalis* (L.) Crantz (Rosaceae) | Breki | Wild service-tree | W | ++ | Fruits | Fresh fruits | Eaten raw |
| *Stachys officinalis* (L.) Trev. (Lamiaceae) 76/GO/09 | Sarushë | Wood betony | W | ++ | Leaves | Fresh leaves are topically applied | Skin infection |
| | | | | | | 2–3 drops applied in the ear | Earache |
| | | | | | | Infusion, topically applied | Menstrual pain, to stop bleeding<br>Wounds |
| *Syringa vulgaris* L. (Oleaceae) 09/GO/09 | Lule jargavani | Common lilac | C | + | Flowers | Mixed with olive oil, used for massage | Spinal column pain |
| *Tamus communis* L. (Dioscoreaceae) 38/GO/09 | Bari për reumë | Black bryony | W | + | Rhizome | Juice used for massages | Anti-rheumatic |
| *Taraxacum officinale* Web. (Asteraceae) 77/GO/09 | Lulëpipëze,<br>Luleshurdh Lulëpipëze<br>Pipilia | Dandelion | W | | Flower | Infusion | Stomach pain<br>Urinary system inflammations Menstrual pain<br>Respiratory inflammation |
| | | | | | | Infusion, added lemon | Anti-cholesterolemic |
| | | | | | Leaves | Leaves chew for several minutes | Toothaches |
| | | | | | Leaves | Infusion | Lung disorders |
| *Teucrium chamaedrys* L. (Lamiaceae) 73/GO/09 | Lule mali<br>Çaj mali | Wall germander | W | + | Flowering aerial parts | Infusion | Respiratory inflammation |
| *Thuja orientalis* L. (Cupressaceae) 11/GO/09 | Selvi | Oriental arborvitae | C | + | Cones | Infusion, used to wash hair | Alopecia |
| *Thymus longicaulis* Presl (Lamiaceae) 75/GO/09 | Lule bjeshke | | W | ++ | Herb, dried | Infusion | Digestive |
| | Timusi | | | | Flowers | Infusion | Mucolithic |

**Table 1** continued

| Botanical taxon, botanical family and voucher specimen code | Albanian folk name(s) | English name | Status | Quotation frequency | Part(s) used | Administration | Treated disease(s) or medical/food uses(s) in Gollak |
|---|---|---|---|---|---|---|---|
| *Thymus serpyllum* L. (Lamiaceae) 67/GO/09 | Tymusi | Breckland thyme | W | + | Flowers | Infusion | Sedative<br>Influenza |
| *Tilia cordata* Mill. (Tiliaceae) 05/GO/09 | Bliri me gjethe të vogla | Small-leaved lime | W | + | Flowers | Infusion | Anti-bronchitis<br>Insomnia |
| *Tilia platyphyllos* Scop. (Tiliaceae) 06/GO/09 | Bliri | Largeleaf linden | W | + | Flowers | Infusion | Lung disorders<br>Used as tea |
| *Trifolium pratense* L. (Fabaceae) 63/GO/09 | Tërfili | Red clover | W | ++ | Flowers | Infusion | Oral cavity antiseptic<br>Anti-rheumatic<br>Appetizing |
| | | | | | | Infusion, used as inhalation | Lung disorders<br>Antitussive |
| *Urtica dioica* L. (Urticaceae) 21/GO/09 | Hithi | Nettle | W | +++ | Flowering areal parts | Infusion, used to wash hair | Anti-dandruff |
| | | | | | | Directly applied on the knee | Anti-rheumatic |
| | | | | | Leaves | Infusion | Anti-diabetic<br>Anti-anemic<br>Anti-hypertensive |
| *Valeriana officinalis* (Valerianaceae) 20/GO/09 | Bari për gji | Valerian | W | + | Leaves | Macerated leaves are mixed with yogurt and topically applied | Breast inflammations |
| *Verbascum* sp. (Scrophulariaceae) 25/GO/09 | "Nevestra", Sarushë | | W | + | Flowers | Infusion | Anti-haemorrhoid |
| *Viola odorata* L. (Violaceae) 33/GO/09 | Lulëvjollce Manushaqe | Sweet violet | W | + | Flowers | Infusion | Antitussive |
| *Zea mays* L. (Poaceae) 14/GO/09 | Kallamoçi, Misri | Corn | C | + | Fruits | Infusion | Lithontriptic<br>Renal pains |

+ quoted by less than 10% of the participants; ++ quoted by more than 10% and less than 40% of the participants; +++ quoted by more than 40% of the participants

mushroom species, three gymnosperms and 92 angiosperms (76 dicotyledonous and 6 monocotyledons). The predominant families: were Rosaceae (21%), Asteraceae (7%), Lamiaceae (5%), and Alliaceae (4%). Approximately two-thirds of the recorded medicinal species were wild.

Most wild plants collected in the villages of Gollak were used for medicinal purposes, while a few (16%) were used food, whereas some other plant species were gathered for sale in the local markets. The most frequently cited medicinal uses referred to respiratory system illnesses (18%), skin inflammations (16%),


**Fig. 2** Location of the Western Balkan areas considered in the comparative analysis

**Table 2** Comparison between the wild medicinal plant uses recorded in Gollak and those recorded in previously conducted ethnobotanical field studies in surrounding Western Balkan regions

| Area and country | Ethnicity | Year(s) when the field studies were conducted | Number of study participants | Number of recorded wild medicinal taxa | % of wild medicinal botanical genera also quoted in Gollak (%) | Number of recorded wild medicinal plant reports | % of wild medicinal plant reports also recorded in Gollak | Reference(s) |
|---|---|---|---|---|---|---|---|---|
| Gollak, Kosovo | Albanians | 2009 | 66 | 73 | | 115 | | |
| Pešter plateau, Serbia | "Bosniakised" Albanians and Serbs | 2010 | 42 | 40 | 65 | 107 | 16% | Pieroni et al. (2011) |
| Kopaonik mountain, Serbia | Serbs | 2002–2005 | 60 | 83 | 37 | 385 | 7% | Jarić et al. (2007) |
| Rtani region, Serbia | Serbs | Before 1988 | N/A | 52 | 48 | N/A | N/A | Milojević (1988) |
| Prokletije mountains, Montenegro | Bosniaks and Serbs | 2006, 2007 | 75 | 135 | 24 | 327 | 7% | Menković et al. (2011) |
| Northern Albanian Alps, Albania | Albanians | 2004, 2007 | 62 | 45 | 53 | 71 | 16% | Pieroni et al. (2005), (2007) |

gastrointestinal troubles (14%), heart diseases (11%), and urinary and genital system (10%).

Various vegetative organs, such as leaves, flowers, root, fruits, rhizome, bark, bulbs, tubers etc. were used. The most frequently quoted manner of preparation of medicinal plants was represented by infusions (42%) and decoctions (25%).

## Comparison of Gollak's ethnobotany with the available ethnobotanical data of surrounding Western Balkan regions

The wild medicinal plant uses recorded in Gollak, which are in common with those of other previously investigated Western Balkan areas, are reported in Table 2.

If the proportion of quoted wild medicinal plant genera, which have been quoted both in Gollak and in other regions (especially in Eastern Serbia, South-Western Serbia and in the Albanian Alps) is remarkable, no significant commonalities can be found instead in the actual, specific medicinal wild plant applications. This demonstrates that, despite the examined areas being part of a macro-region, which have had for many centuries common historical trajectories—the local medico-botanical knowledge remains pretty specific to each single area.

These findings confirm that conducting rigorous field ethnobotanical studies with extensive sampling of the interviewees within a cross-cultural perspective does still represent a crucial starting point for an in-depth understanding of how plant knowledge changes across geographies and cultures. It also provides a way to examine to which degree such knowledge is intertwined with plant knowledge coming from other sources (i.e. ancient herbals, popular phytotherepeutical books and/or new media).

## Future perspectives

The traditional knowledge that we recorded is demonstrative of a remarkable intangible cultural heritage in the area. However, the traditional use of plants is declining due to economic factors such as displacement and urbanization processes. The ethnobotanical data recorded provide an interesting basis for further phytotherapeutical researches, for fostering sustainable uses of plant resources and also for promoting local biocultural diversity through ecotourism initiatives.

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