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Professional paper

CURRENT STATUS OF FUNCTIONAL FOOD AND MEDICINAL PLANTS IN ETHNOBOTANY STUDIES OF ASTERACEAE FAMILY AMONG ALBANIANS IN THREE WESTERN BALKAN COUNTRIES: AN OVERVIEW OF PUBLICATIONS IN THE FIELD

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Abstract

An ethnobotanical review on traditional uses of Asteraceae family species among Albanians in the three Western Balkan countries (Kosovo, Albania and North Macedonia) was made. Four most relevant databases: PubMed, Scopus, Google Scholar and ResearchGate were searched in order to find published studies on the field of ethnobotany for Albania, North Macedonia and Kosovo. In addition, to fulfill the search we use reference lists of retrieved articles and manual Google search. A total of 16 ethnobotanical studies performed in Western Balkan where the majority of Albanians live were identified for the period between 2013 and 2020. Of these studies 5 (31%) were performed in Albania, 8 (50%) in North Macedonia and 3 (19%) in Kosovo. In the future, ethnobotanical studies among Albanians should be conducted in line with theoretical developments, including cultural niche construction and adaptations as a result of a cumulative cultural evolution.

Keywords: Asteraceae, Western Balkans, Ethnobotany, Cultural niche, Albanians

Background

The aster family (Asteraceae) is one of the largest and economically most important angiosperm families, with more than 1,620 genera and 23,600 species of herbaceous plants, shrubs, and trees distributed throughout the world (Funk et al., 2005). This family can be easily recognized by its characteristic feature of inflorescences. A combination of several specialized morphological characteristics (e.g., capitula or head, highly reduced and modified flowers, inferior ovaries, syngenesious anthers) strongly supports the naturalness of the family (Harris, 1995; Jansen & Palmer, 1987). Members of several genera of the family are well-known for their horticultural value and popular in gardens across the world and include zinnias, marigolds, dahlias, and chrysanthemums. The commercial sunflower genus *Helianthus* has been used as a model in the study of hybridization and its role in speciation (Rieseberg et al., 2003). Almost all species of Asteraceae family produce secondary metabolites; such are flavonoids and terpenoids which have lots of effect on our body. The medicinal values and especially pharmacological effects of flavonoids on immune system have been studied in many studies (Swanepoel, 1997; Van Wyk & Greicke, 1997; Mojtaba and Morteza, (2019).

Many of Asteraceae family are also plants which have been used in Albanian traditional medicine. Western Balkan is rich in biological, cultural and landscape diversity and have a high considerably

number of medicinal and aromatics plants including the species of Asteraceae (Hayek 1924–1933; Turrill 1929; Markgraf 1932; Horvat et al. 1974; Davis et al. 1994; Kryštufek and Reed 2004; Stevanović et al. 2007, Rexhepi et al. 2013). Albanian traditional medicine is created and developed almost similar to traditional medicine found in other socio-cultural systems. The use of medicinal plants and the emergence of medical system it is related not only to their own tradition but also their being part for over five centuries of the Ottoman Empire.

During the medieval and early modern period in the Ottoman Empire, the medical hierarchy had three official distinguishable positions: physicians (known as *hekims* or *tabibs*), surgeons (*cerrahs*), and ophthalmologists (*kehahs*) (Shefer-Mossensohn, 2011). The *cerrahs* in Albanian society were specialized in one or several body organs or medical techniques and they used different parts of plants like *Artemisia absinthium* L., etc., during their work (Minga, 2009). In addition, traditional ecological knowledge in Albanian society is expressed in people's perceptions and cultural practices in relation to nature. More specifically, in their perceptions and cultural practices regarding mountains, rivers, and vegetations etc. (Tirta, 2004). Even after the improvement of sanitation, healthcare and building of the hospitals before and during communism period in Albania, most of the population counted on traditional medicine and traditional healers. Before the 1980s, in Albania, ethnomedicine studies were conducted by the researchers of the Institute of Folk Medicine, for the identification and study of traditional receipts and traditional practices (Kokalari et al., 1980). Unlike Albania in Kosovo and North Macedonia this traditional knowledge remains neglected by the former Yugoslav system. After 2000s, there have been conducted a number of ethnobotanical field studies among Albanians living in Balkan area. They were conducted in northern, eastern, southern, north-eastern and south-eastern Albania (Pieroni et al., 2005; Pieroni, 2008; Pieroni, 2010; Pieroni et al., 2014; Mustafa et al., 2012; Pieroni et al., 2015; Peçi et al., 2016; Pieroni, 2017), Kosovo (Mustafa et al., 2011; Mustafa et al., 2015; Hajdari et al., 2018), North Macedonia (Pieroni et al., 2013; Rexhepi et al., 2013; Rexhepi B (2017); Rexhepi et al., 2017; Rexhepi B (2018); Rexhepi B & Bajrami A (2018); Rexhepi et al., 2018). These studies have been important in documenting traditional ecological knowledge and ethnobotanical practices of Albanians and other ethnicities living in Balkans, using cross-cultural comparison.

Material and methods

Search strategy

Databases (PubMed, Scopus, Google Scholar and ReserachGate) were searched for published studies done on the field of ethnobotany in Kosovo, Albania and North Macedonia. Some studies were also identified through a manual Google search. Additional articles were also searched from reference lists of retrieved articles. The following keywords were used in combination in the database searches: Asteraceae, ethnobotany, ethnobotanical, ethnobiology, ethnoecology, North Macedonia, Albania and Kosovo. Those studies which do not contain typical ethnobotanical information are excluded from this review. These keywords include research in which the authors of these studies are assumed to be included in one of these fields. Our survey was concentrated to the most recent studies published between 2004 and 2020.

The following information's are taken into consideration:

- Country in which the study was conducted
- Citation of the authors and year of publication as indicated in the journal
- Title of the research

- Number of reported plants

At the end the following details of medicinal and edible plants were extracted from each study using an abstraction form: scientific and local names, habit and plant parts used, methods of preparation and administration as well as the disorder type.

Study area and Ethnographic background

Geographically, Kosovo, North Macedonia and especially Albania have always been at the crossroads of empires and civilizations (Elsie, 2015). Even today there is no similar nation in Europe that lives divided in seven different countries (Greece, Montenegro, Albania, Kosovo, North Macedonia, Serbia and Bosnia and Herzegovina) like the Albanians. According to many writers Albanians are one of the oldest people in the Western Balkans. The Albanians were originally a small transhumant shepherding community in the mountains of the southwestern Balkans and for many centuries they did not play a major role in historical events (Elsie, 2015). In ancient times, the region of study area was known as Illyria (Gk. Ἰλλυρία, Lat. Illyricum). The term Illyria is actually somewhat confusing because it can also refer to a much larger region - virtually the whole of the eastern Adriatic coast, encompassing what is now the territory of Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Kosovo and Albania (Elsie, 2015). The Illyrians were Indo-Europeans of the ancient period, who were made up of from following tribes: Albani or Albanoi (Gk. Ἀλβανοί); Amantes (Gk. Ἀμαντες); Ardiaei (Gk. Ἀρδιαῖοι); Bylliones (Gk. Βυλλιόνες); Chelidoni (Gk. Χελιδόνες); Dardani (Gk. Δαρδάνιοι); Encheleae (Gk. Ἐγγέλιοι); Labeatae (Gk. Λαβεάται); Parthini (Gk. Παρθηνοί); Penestae (Gk. Πενέσται) and Taulanti (Gk. Ταυλάντιοι). Even today the national ideology insists on an unequivocal ethnic relationship with the ancient Illyrians (Sotirovic, 2013).



Figure 1. Map of Albanian population

Results and discussion

A total of 14 ethnobotanical studies performed in three Western Balkan countries where the majority of Albanians live were identified for the period between 2013 and 2020. Five of these studies, respectively 31% were performed in Albania, eight (50%) in North Macedonia and three (19%) in Kosovo (Table 1). During this review a total of 15 medicinal plant species belonging to Asteraceae family have been determined. The information includes scientific and local names, common methods of preparations, and reported ethnobotanical uses per each country (Table 2).

As a result of comparative study it was observed that *Achillea millefolium* L., was reported to have similar Antipyretic and Stomachic uses in all three countries (Kosovo, Albania and North Macedonia), whereas similar uses between results from Kosovo and North Macedonia were detected on Anti-diabetic uses. The rest of the usage reports are specific reports for the respective countries as shown in Table 2.

All reports on the *Arctium lappa* L. are specific to the respective countries, i.e. no similarities have been found. Whereas in the case of *Artemisia absinthium* L., similar use is observed on stomachic effects between reports from Albania and Kosovo, and anti-anemic effects between Kosovo and North Macedonia reports. More similarities between Albania and North Macedonia stand out on antipyretic and antiviral uses of *Bellis perennis* L. No similar reporting was found for *Calendula officinalis* L. Greater similarity between all countries has been detected on the reports of *Chamomilla recutita* L., as stomachic and digestive.

What stands out is related to following species: *Cichorium intybus* L., *Helianthus annuus* L., *Helichrysum arenarium* (L.), *Helichrysum plicatum* (L.), *Onopordum acanthium* L., *Silybum marianum* (L) Gaertn., *Tanacetum vulgare* L., and *Tussilago farfara* L., where no data are reported for Albania and Kosovo. In the same line with other species the reports on *Taraxacum officinale* F.H. Wigg., dissociate the antipyretic similarities in all three countries.

Reports from all countries show that the search for active ingredients of the plant two main type of preparation are used, namely the decoction is the most common i.e. most frequently form of administration followed by infusions. Obviously in Albanian traditional botanical culture the decoction remains the most effective way that allows the extraction and assimilation of active ingredients.

We noticed that the 75% of Asteraceae species were collected from wild, while 25% were collected from home gardens or agricultural fields (Fig 2).

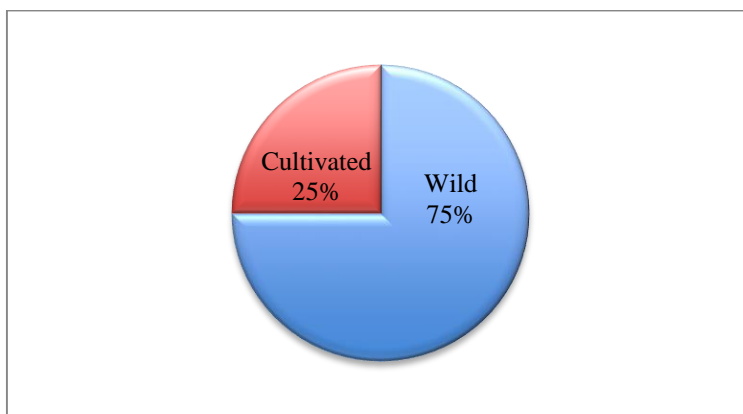


Figure 2. Origin of availability

Albanian people in all three mentioned countries harvest mostly the aerial parts (flower, leaf, and fruit) of the plants for the preparation of traditional remedies.

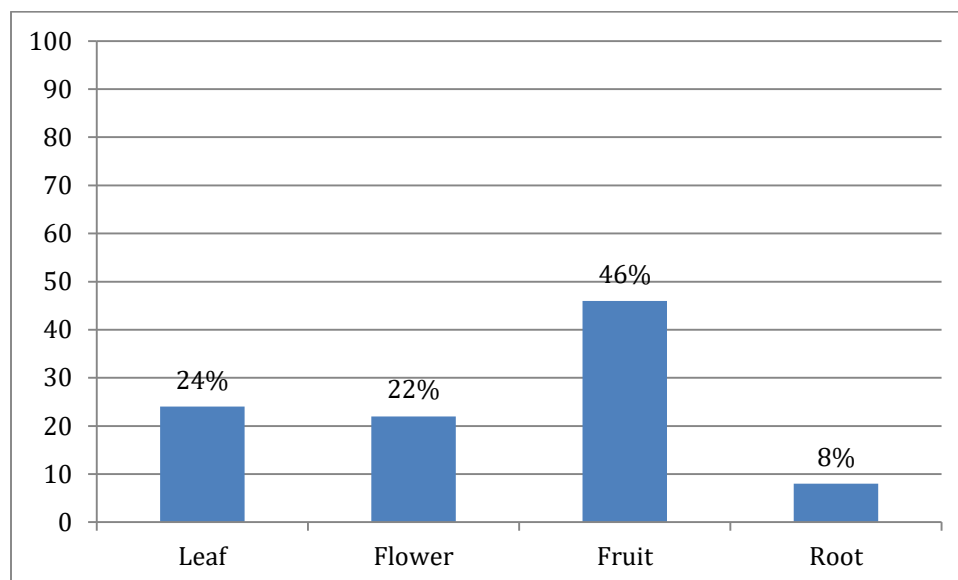


Figure 3. Percentage of plants parts used

Among the functional food and medicinal plant preparations and use(s), decoctions were found to be more popular (79%), followed by hot and cold infusions (11%) and tinctures (5%).

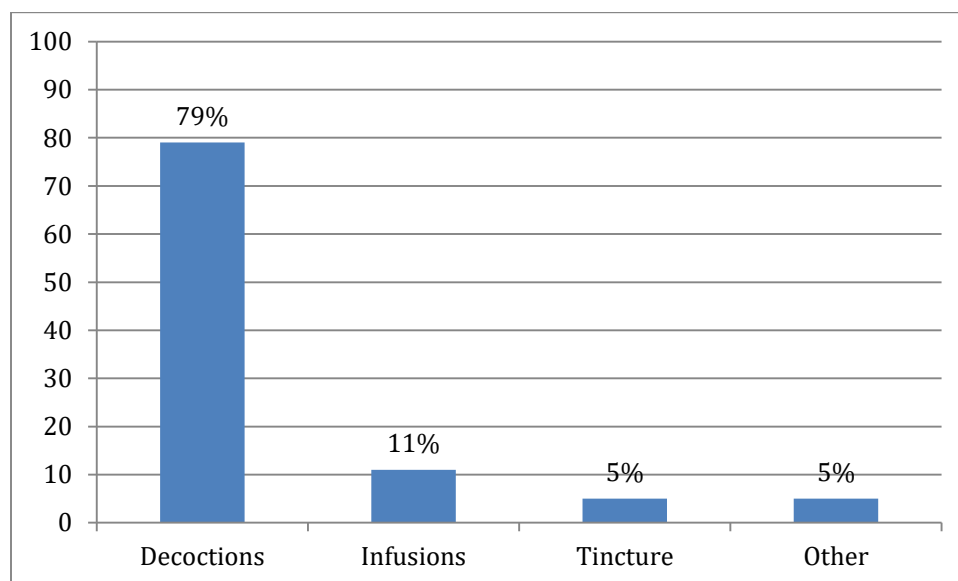


Figure 4 Mode of preparations and their percentages

Age, gender and impact of religion in traditional Albanian botanical knowledge

In this reviews, we found that in all three countries the majority of informants were between 40 and 60 ages, followed by informants who were reported to be older than 60 years. Furthermore, in many of the published papers of Western Balkans countries we noticed that the age was very important variable together with gender. Although most other studies also rarely provide mechanistic explanation for why age or gander can drive knowledge dynamics, there are various arguments put forward to explain these patterns. For example, according to Brandt *et al.* 2013 and Hanazaki *et al.* 2013 the medicinal botanical knowledge is considered as a very long vertical process of learning (elderly people have simply had more time to acquire it), while, in many traditional cultures as in Albanian case, women serve as the primary healthcare providers in their families, so it is understandable their medicinal plant knowledge is greater than that of men (Albuquerque et al. 2011; Rexhepi et al. 2013).

In terms of “cultural iceberg” Albanian community possess beliefs which can be grouped under the term “religion”. Since the Albanians, for centuries are known for welcoming the religious diversity and strongly welcoming the idea of the supremacy of a given religion the case of impact of different beliefs where also analyzed. What makes the Albanian people “unique” beyond different religions is that on the basis of environment they share similar relations. The analysis of the data shows that, medicinal plants are equally used by Muslim, Orthodox and Catholic Albanians.

Table 1. References consulted

Country	Citation	Research title	Number of plants
Albania	Pieroni, A (2017)	Traditional uses of wild food plants, medicinal plants, and domestic remedies in Albanian, Aromanian and Macedonian villages in South-Eastern Albania	62
	Pironi, A, Soukand, R (2016)	The disappearing wild food and medicinal plant knowledge in a few mountain villages of North-Eastern Albania	54
	Pieroniet <i>al.</i> , 2015	An ethnobotanical study among Albanians and Aromanians living in the Rraicë and Mokra areas of Eastern Albania	62
	Pieroniet <i>al.</i> , 2014a	Resilience at the border: traditional botanical knowledge among Macedonians and Albanians living in Gollobordo, Eastern Albania	54
	Pieroniet <i>al.</i> , 2014b	Local Knowledge on Plants and Domestic Remedies in the Mountain Villages of Peshkopia (Eastern Albania).	62
North Macedonia	Rexhepi et al., 2013	Traditional medicinal plant knowledge among Albanians, Macedonians and Gorani in the Sharr Mountains (Republic of Macedonia).	54

	Pieroni <i>et al.</i> , 2013	One century later: the folk botanical knowledge of the last remaining Albanians of the upper Reka Valley, Mount Korab, Western Macedonia	62
	Rexhepi, B (2017a)	Ethnobotanical Study of Some Medicinal and Edible Plants in Northeastern Statistical Region of Macedonia	54
	Rexhepi <i>et al.</i> , 2017	Ethnobotanical Study of Wild Edible Plants in Pelagonia Region (Southwestern Macedonia).	54
	Rexhepi & Bajrami (2018)	Conservation of Wild-harvested Medicinal Plants Species in Macedonia.	54
	Rexhepi <i>et al.</i> , 2018	Three Ethnic groups, One Territory: Perspectives of an ethnobotanical study from Southwestern Macedonia.	62
Kosovo	Mustafa <i>et al.</i> , 2015	A cross-cultural comparison of folk plant uses among Albanians, Bosniaks, Gorani and Turks living in south Kosovo.	54
	Mustafa <i>et al.</i> , 2012a	An ethnobotanical survey of the Gollak region, Kosovo.	62
	Mustafa <i>et al.</i> , 2012b	Medical ethnobotany of the Albanian Alps in Kosovo	54

Table 2. Reports of Asteraceae family in Albanian traditional botanical knowledge (Western Balkans).

Scientific and local names	Methods of preparation	Ethno botanical uses		
		Albania	North Macedonia	Kosovo
<i>Achillea millefolium</i> L. Fletsharri ^(MKD) , Lulebardh, lulexhize ^(ALB) , Barpezmatimi, Hajdukati ^(KOS)	Decoction ^(MKD) Infusion ^(ALB, KOS)	Antidiarrhetic; Hemostatic; Antipyretic; Antitussive; Antiviral; Febrifuge; Otogenic; Stomachic; Cicatrizer.	Antipyretic; Antitussive; Febrifuge; Anti-microbial; Stomachic; Anti-diabetic; Digestive.	Anti-microbial; Anti-coagulant; Anti-cholesterolmic; Antiemetic; Appetizer; Anti-diabetic; Antipyretic; Carminative; Spasmolytic; Stomachic; Hepatic; Anti-allergic; Anti-dermatic.
<i>Arctium lappa</i> L. Rrodhe ^(MKD) ,	Decoction ^(MKD) Infusion ^(ALB, KOS)	Cardiotonic; Appetizer	Antipyretic; Antitussive;	Flatulance; Lithontriptic;

Fioga, Ilapusha ^(ALB) Bullushtra ^(KOS)			Antiviral; Febrifuge	Anti-dermatic; Anti-inflammatory
<i>Artemisia absinthium</i> L. Pelin ^(MKD) Fshisa, pelini ^(ALB, KOS)	Decoction ^(MKD) Infusion ^(ALB, KOS)	Stomachic; Antidiarrhetic	Anti-anemic; Anti-tuberculosis; Euphoriant; Anesthetic	Anti-anemic; Anti-malarial; Appetizer; Anti-parasitic; Relaxant; Stomachic; Anti-asthmatic; Anti-diabetic; Nail infection
<i>Bellis perennis</i> L. Lulebuke ^(MKD) , Lulebardh ^(ALB, KOS)	Decoction ^(MKD) Infusion ^(ALB, KOS)	Antipyretic; Antitussive; Antiviral; Febrifuge	Antipyretic; Antiviral; Appetizer	Anti-dermatic
<i>Calendula officinalis</i> L. Verdhashkë ^(MKD) , Kamomilë e kuqe, kamomilë e verdh ^(ALB) Luledukati, Lulduhani ^(KOS)	Decoction ^(MKD) Infusion ^(ALB, KOS)	Antibacterial (infections in animals)	Anti-dermatic	Anticoagulant; Diuretic; Anti-hepatic; Stomachic
<i>Chamomilla recutita</i> L. Kamilicë ^(MKD) Lulebardh ^(ALB) , Luleqeni, Kamomil ^(KOS)	Decoction ^(MKD, ALB) Infusion ^(ALB, KOS)	Stomachic; Antidiarrhetic; Digestive; Sedative; Relaxant	Anesthetic; Anti-dermatic; Anti-hemorrhoids; Antimicrobial; Anti-bacterial; Uveitic; Diuretic; Digestive; Stomachic	Antimicrobial; Digestive; Uveitic; Anti-bacterial; Anti-dermatic; Diuretic; Stomachic; Anti-rheumatic; Tonsillitis; Rhinosinusitis; Gingivitis
<i>Cichorium intybus</i> L. Çikore ^(MKD, KOS)	Decoction ^(MKD) Infusion ^(KOS)	No data available	Antiseptic; Diuretic	Hepatic; Cardio-tonic; Atherosclerosis; Anti-diarrhetic
<i>Helianthus annuus</i> L. Luledielli ^(MKD, KOS)	Decoction ^(MKD) Infusion ^(KOS)	No data available	Stomachic	Anti-dermatitis
<i>Helichrysum arenarium</i> (L).	Decoction ^(MKD)	No data available	Digestive; Diuretic	No data available

Ake ^(MKD)				
<i>Helichrysum plicatum</i> (L). Moench. Ake ^(MKD)	Decoction ^(MKD)	No data available	Digestive; Diuretic	No data available
<i>Onopordum acanthium</i> L. Feramagari ^(MKD)	Decoction ^(MKD)	No data available	Antiseptic; Cardio-tonic	No data available
<i>Silybum marianum</i> (L) Gaertn Gjembgomari ^(MKD)	Decoction ^(MKD)	No data available	Antiseptic	No data available
<i>Tanacetum vulgare</i> L. Karajpel ^(MKD) Pelin i verdhë ^(ALB)	Decoction ^(MKD)	No data available	Antipyretic	No data available
<i>Taraxacum officinale</i> F.H. Wigg. Luleshurdha ^(MKD) Qumështorja, luleqeni ^(ALB) , Tamëlçak i livadhët, Lulepipëze, Luleshurdh, Pipilia ^(KOS)	Decoction ^(MKD,ALB) Infusion ^(KOS)	Antipyretic; Antitussive; Antiviral; Febrifuge	Diuretic; Antipyretic	Hepatitis; Cardio-tonic; Digestive; Diuretic; Anti-anemic; Stomachic; Dysmenorrhoea; Emmenagogue; Antipyretic; Antitussive; Antiviral; Febrifuge
<i>Tussilago farfara</i> L. Thundërmushk ^(ALB, MKD)	Decoction ^(MKD)	No data available	Antipyretic	No data available

Conclusions

This paper clearly represents a deep-rooted ethnobotanical heritage of Asteraceae family in Albanian population living in Kosovo, Albania and North Macedonia. Traditional botanical knowledge among Albanians living in the Balkans is expressed in their classification, perceptions and cultural practices in relation to nature. Both wild and locally cultivated plants for food and medicinal use to meet their dietary and medical needs continue to play an important role in everyday life especially, in rural areas. These perceptions and behaviors are responsible for the construction of the socio-ecological system as a whole. In the future, studies among Albanians should be conducted in line with theoretical developments, including cultural niche construction and adaptations as a result of a cumulative cultural evolution.

Limitations of the study

This study was limited only in three of seven countries of Western Balkans where Albanians are present.

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