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RESEARCH ARTICLE

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Traditional plant uses in villages of the Camili Biosphere Reserve Area (Artvin, Türkiye)

Camili Biyosfer Rezerv Alanı (Artvin, Türkiye) köylerinde geleneksel bitki kullanımları

Özgür EMİNAĞAOĞLU [a,d], Melahat ÖZCAN [a], Funda ERŞEN BAK [a], Hayal AKYILDIRIM BEĞEN [b], Ekrem SARALIOĞLU [c], Şevval SALİOĞLU [a*], Bahar ASLAN [d], Canan AÇIKGÖZ HARŞIT [a], Emine YAZICIOĞLU [d], Nasibe TEKİNER AYDIN [d]

[a] *Department of Forest Engineering, Faculty of Forestry, Artvin Çoruh University, 08000, Artvin, Türkiye*

[b] *Medical Services and Techniques Department, Vocational School of Health Services, Artvin Çoruh University, 08000, Artvin, Türkiye*

[c] *Department of Geomatics Engineering, Faculty of Engineering, Artvin Çoruh University, 08000, Artvin, Türkiye*

[d] *Ali Nihat Gökyiğit Botanical Garden Application and Research Center, Artvin Çoruh University, 08000, Artvin, Türkiye*

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**Corresponding author*:
e-mail: sevvalsalioglu@artvin.edu.tr
ORCID: 0000-0002-7601-5140

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ABSTRACT

This study was conducted between 2021 and 2023 to document Biodiversity-Based Traditional Knowledge (BBTK) in five villages located in the Camili Biosphere Reserve (Artvin, Türkiye). Questionnaire surveys were administered to 34 permanent residents, yielding a total of 336 questionnaire records. Within the study area, local people were found to use 90 plant taxa belonging to 43 genera and 25 families for various ethnobotanical purposes. Of these taxa, 78 were classified within Magnoliopsida, 11 within Liliopsida, and 1 within Pinopsida. Regarding life forms, 60 taxa were herbaceous, 8 were trees, 21 were shrubs, and 1 was a climber. The families with the highest numbers of medicinal–aromatic plant species were Rosaceae (16 species; 17.8%), Polygonaceae (14 species; 15.6%), Hypericaceae (9 species; 10.0%), Primulaceae (8 species; 8.9%), Asteraceae (6 species; 6.7%), and Amaryllidaceae (5 species; 5.6%). Among the 336 records documented during the surveys, 186 concerned health-related uses, 132 were related to nutrition/food, 6 to industrial purposes, 8 to agriculture–livestock activities, and 4 to other uses. In the health category, the most frequently utilized plant parts were flowers (42 use-reports), followed by fruits (36), aerial parts (24), leaves (22), resin (20), and roots (18). In the food category, leaves were the most commonly used parts (50 use-reports), followed by aerial parts (42), fruits (28), and bulbs (6). Plants were used primarily to treat respiratory system disorders (20.9%), skin diseases (19.8%), general disease (16.5%), ear–nose–throat disorders (13.2%), cardiovascular diseases (6.6%), urological disorders (5.5%), musculoskeletal disorders (4.4%).

ÖZ

Bu çalışma, 2021-2023 yılları arasında, Biyoçeşitliliğe Dayalı Geleneksel Bilginin (BGB) kayıt altına alınması amacıyla, Artvin İli, Borçka İlçesi, Camili Bölgesi'nde bulunan 5 köyde yerleşik yaşayan 34 kişiye anket uygulanarak 336 anket verisi elde edilmiştir. Araştırma alanında, yöre halkı tarafından, çeşitli etnobotanik amaçlarla 25 familya 43 cinse ait 90 farklı bitkinin kullanıldığı belirlenmiştir. Tespit edilen bu bitkilerin 78'si Magnoliopsida, 11'i Liliopsida, ve 1'i Pinopsida sınıfında yer almaktadır. Bu bitkilerin 60'ı otsu, 8'i ağaç, 21'i çalı, 1'i tırmanıcıdır. En fazla tıbbi-aromatik bitki türü içeren familyalar sırasıyla; Rosaceae (16 tür; 17.8%), Polygonaceae (14 tür; 15.6%), Hypericaceae (9 tür; 10.0%), Primulaceae (8 tür; 8.9%), Asteraceae (6 tür; 6.7%), and Amaryllidaceae (5 tür; 5.6%). Anket uygulamalarında tespit edilen toplam veri sayısı 336 olup, bunlardan 186'sının sağlık, 132'sinin beslenme, 6'sının endüstriyel, 8'inin tarım-hayvancılık, 4'ünün ise diğer olduğu tespit edilmiştir. Sağlık kategorisinde; bitkilerin en fazla kullanılan kısmı çiçek (42 kullanım) olurken, bunu meyve (36 kullanım) ve topraküstü kısım (24 kullanım), yaprak (22 kullanım), reçine (20 kullanım), kök (18 kullanım) takip etmektedir. Gıda kategorisinde ise; bitkilerin en fazla kullanılan kısım yaprak (50 kullanım) olurken, bunu topraküstü kısım (42 kullanım), meyve (28 kullanım), soğan (6 kullanım) takip etmektedir. Bitkiler solunum sistemi hastalıkları (%20.9), cilt hastalıkları (%19.8), genel rahatsızlıklar (%16.5), kulak-burun-boğaz hastalıkları (%13.2), kalp-damar hastalıkları (%6.6), üroloji hastalıkları (%5.5), kas-kemik hastalıkları (%4.4) tedavisi amacıyla kullanılmaktadır.

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1. INTRODUCTION

The flora of Türkiye comprises 10.460 species, 2.066 subspecies, 888 varieties, and 287 hybrids. Of the approximately 12.000 plant taxa that occur naturally in Türkiye, scientific studies have identified 1.400 taxa with medicinal and aromatic properties; of these, 850 taxa (60%) are naturally distributed in Artvin. Moreover, of the 500 plant speciesused for medicinal–aromatic purposes and subject to trade in Türkiye, 350 species (70%) occur naturally in Artvin (Özhatay et al., 2022; Eminağaoğlu & Akyıldırım Beğen, 2023; Eminağaoğlu et al., 2022; Eminağaoğlu, 2023).

Artvin is one of the most important provinces of Turkey in terms of biological diversity, with 4 key plant and nature areas (Karçal Mountains, Çoruh Valley, Eastern Black Sea Mountains and Yalnızçam Mountains), 1 biosphere reserve (Camili), 2 national parks (Karagöl–Sahara and Hatila Valley), 3 nature reserves (Camili–Efeler Forest, Camili–Gorgit and Çamburnu) and 5 nature parks (Borçka–Karagöl, Altıparmak, Balıklı Güneşli Waterfalls, Tavşan Hill and Cehennem Deresi Canyon). The region lies within the "Caucasus Biodiversity Hotspot", which is one of the 36 most important and simultaneously most threatened biodiversity hotspots in the world. Artvin is located both within the "Caucasus–Anatolian–Hyrcanian Temperate Forests", one of the 200 ecoregions of global conservation priority, and within the "North-eastern Anatolia Plant Diversity Centre" (Eminağaoğlu, 2015).

The province of Artvin, with its wide variety of habitats, an altitudinal gradient of approximately 4000 m, the influence of three different climate types (Mediterranean, continental and oceanic), abundant water resources, and geological and geomorphological heterogeneity, provides suitable conditions for the occurrence of a great number of different plant species. With a total of 2.727 native vascular plant taxa belonging to 137 families and 761 genera, Artvin is the richest province of Turkey in terms of vascular plant diversity. Of these, 198 taxa are endemic and 302 are non-endemic but rare, so that a total of 500 taxa are considered to be under threat (Eminağaoğlu, 2015). This exceptional richness has also motivated regional initiatives aimed at ex situ conservation, education and public awareness through botanical garden establishment and, more recently, the development of sustainability-oriented planning and design principles for the Artvin Çoruh University Ali Nihat Gökyiğit Botanical Garden (Eminağaoğlu & Eminağaoğlu, 2018; Eminağaoğlu & Eminağaoğlu, 2024).

Camili Biosphere Reserve, known as the first biosphere site of Turkey, is one of the 727 sites in 131 countries worldwide. It is one of the cradles of much younger postglacial forests of Central Europe and one of the few well-known refuges for tertiary flora in the Colchic region. The study area is not only located within the Caucasus Hotspot, one of the 36 World Biodiversity Hotpots identified by the Conservation International, but also within the Caucasus-Anatolian-Hyrcanian Temperate Forests classified as one of the 200 Global Ecoregions (Davis at al., 1994; Zazanashvili et al., 1999). Moreover, it lies within the North-eastern Anatolia Centre of Plant Diversity (SWA No.19) and covers the Karçal Mountains, designated as one of the 122 Important Plant Areas (IPA) in Turkey (Özhatay et al., 2003, 2005).

Ethnobotanical studies aim to document, in a systematic manner, how local communities use plants—particularly for medicinal purposes—thereby safeguarding traditional knowledge that is at risk of being lost due to environmental pressures and cultural change (Giday et al., 2009). The resulting findings indicate which taxa are most prominent within specific use categories and how knowledge is distributed across social groups, providing a comparable baseline dataset to inform conservation prioritization and sustainable management/harvesting decisions (Giday et al., 2009). Moreover, such records contribute to the evidence base and regulatory framework required for the safe integration of traditional/complementary medicine into health systems—focusing on quality, safety, and efficacy—and can support the prioritization of candidate species for drug discovery research (WHO, 2022; Mahwasane et al., 2013).

This study aims to document the traditional uses of plants among the rural population living in the villages of Camili, Düzenli, Efeler, Maral and Uğurköy, located in the Camili Region of the Borçka district of Artvin Province, including their use for medicinal, food, spice, tea and ornamental purposes, thereby providing the first comprehensive and quantitative ethnobotanical dataset for this region and contributing to the preservation of biodiversity-based traditional knowledge and the

identification of previously under-documented ethnobotanical practices in northeastern Türkiye.

2. MATERIALS AND METHODS

2.1. Research area

The research area, Camili Biosphere Reserve, is located in Borçka district, 30 km north-west of Artvin, Turkey. It lies between the latitudes 41°20.49' and 41°31.32', and the longitudes 41°49.36' and 42°05.27'. The altitude of the area ranges from 370 m to 3435 m. Bordering with Georgia to the north, it is surrounded by high and very steep mountains all around. The Reserve lies within the Colchic subprovince of the euxine province of the Euro-Siberian floristic area in the Holarctic region (Davis, 1965; Zohary, 1973) and is situated in the A8-A9 squares according to Davis's grid system (Davis, 1965). The vegetation map of the study area is shown in Figure 1. The study area is a large watershed covering about 25.275 ha with 2 nature reserves, i.e. Camili-Gorgit Strict Nature Reserve (490.5 ha) and Camili-Efeler Forest Strict Nature Reserve (1453 ha). Unfortunately, there is no meteorological station in the study area. The nearest stations are located in Borçka, south-west of the area at an altitude of 120 m (Eminağaoğlu et al., 2008).

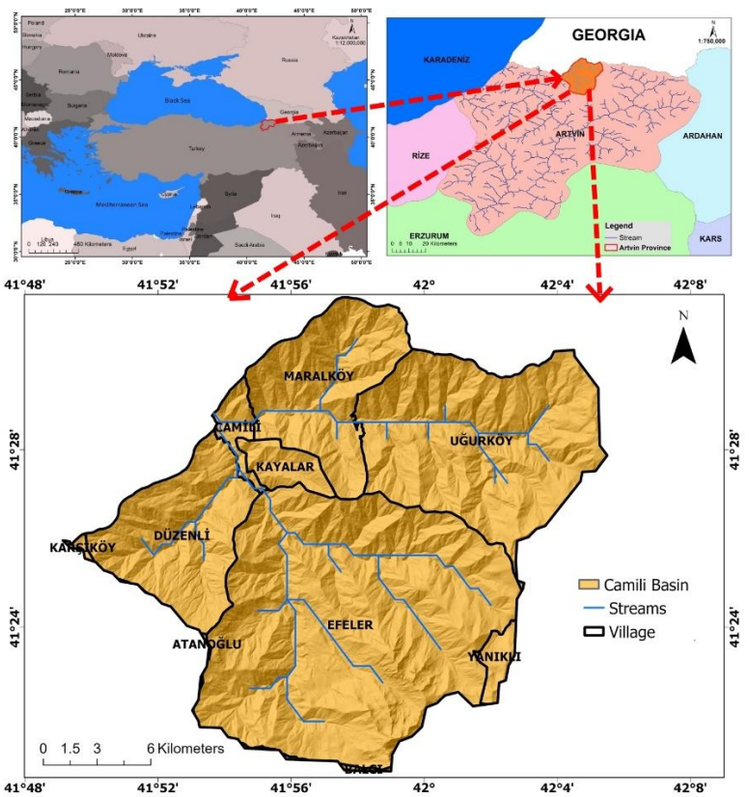

Figure 1. Map of the study area

2.2. Collection of etnobotanical data

Direct interviews with people were performed from 2021 to 2023. A total of 34 informants were interviewed with oral prior informed consent in this region. During the interviews, we recorded demographic characteristics of the study participants, and local names, utilized parts and preparation methods of the plants. Most participants were over 40 years old, as interviews were conducted with many knowledgeable individuals.

Collected specimens were dried and prepared following standard herbarium techniques and were deposited in the Artvin Çoruh University Herbarium (ARTH). For the microscopic identification and nomenclatural treatment of the plant material, the principal references used were Flora of Turkey and the East Aegean Islands (Davis, 1965–1985; Davis et al., 1988; Güner et al., 2000) and Resimli Türkiye Florası (Güner, ed., 2014–2022). Additional resources consulted included Flora USSR (Komarov, 1934–1978), Flora Kavkaza (Grossheim, 1939–1967), other regional floras, illustrated plant atlases (Özhatay et

al., 2010; 2009, 2012, 2015; Eminağaoğlu & Aksu, 2015; Eminağaoğlu et al., 2015), and comparative material housed in the Artvin Çoruh University Herbarium (ARTH).

Numerous floristic and ethnopharmasotic studies have also been conducted in the vicinity of the study area (Eminağaoğlu & Anşin, 2003, 2004, 2005, 2009; Eminağaoğlu et al., 2007; Eminağaoğlu, 2009, 2012; Güner et al., 2012; Eminağaoğlu et al., 2012a, 2012b; Eminağaoğlu &Özcan, 2013; Eminağaoğlu, 2015; Eminağaoğlu et al., 2018a; Eminağaoğlu et al., 2018b; Erenler et al., 2017, 2019; Camadan et al., 2023; Eminağaoğlu & Akyıldırım Beğen, 2024; Karan et al., 2024).

2.3. Data analysis (Calculations)

To characterize similarities and differences among individual knowledge sets and to assess the relative importance of medicinal plants in the Camili Region, several quantitative ethnobotanical indices were calculated. In this study, a use report (UR) was defined as a record in which an informant mentioned the use of a given plant species for a specific use/ailment category. Calculations were based on species-level totals, the number of informants, and the distribution of URs across ailment categories. Use Value (UV) was used to quantify the relative local importance of each species (Rossato et al., 1999; Phillips & Gentry, 1993; Albuquerque et al., 2006). UV was calculated as: UV = ΣU / N where ΣU is the total number of use reports recorded for a given species and N is the total number of informants. To evaluate the degree of agreement among informants regarding plant use within each ailment category, the Informant Consensus Factor (ICF) was calculated (Trotter & Logan, 1986; Heinrich et al., 1998): ICF = (Nur − Nt) / (Nur − 1) where Nur is the total number of use reports in a given ailment category and Nt is the number of different plant species reported for that category. Values approaching 1 indicate high consensus among informants. The Fidelity Level (FL) was applied to determine the specificity (faithfulness) of a plant species to a particular ailment category (Friedman et al., 1986; Chaachouay, 2019): FL(%) = (Np / N) × 100 where Np is the number of informants who cited the use of a plant species for a particular ailment category and N is the total number of informants who reported using that plant for any purpose. Species with high FL values are interpreted as being more specifically preferred for that ailment category, whereas low FL values suggest use across multiple categories. To capture the overall cultural salience of each species within the community, the Cultural Importance Index (CI) was calculated (Pardo-de-Santayana et al., 2007; Tardío & Pardo-de-Santayana, 2008): CI = Σ(UR / N) where UR represents the number of uses reported by informants and N is the total number of informants. CI summarizes both the spread and the intensity of a species' uses across the study population. To describe how broadly each species was used across different use domains, the Use Diversity Index (UDI) was computed as: UDI = (total number of uses) / (number of distinct use categories) Higher values indicate a wider use spectrum. The Relative Frequency of Citation (RFC) (Günbatan et al., 2025) was calculated to reflect how widely known and commonly cited each species was in the study population: RFC = FC / N where FC is the number of informants who mentioned (cited) the species and N is the total number of informants. Finally, to express the representativeness/intensity of plant use within specific ailment categories, the Healing Index (HI) was calculated as: HI(%) = (number of plant species used for a specific ailment / total number of reported plant species) × 100 This index was used to summarize the relative weight of plant-based treatments at the ailment-category level. Together, these indices were interpreted to identify, the relative local importance of species, informant consensus across ailment categories, and species showing higher specificity or preference for particular health conditions in the Camili Region. The combined use of UV, ICF, FL, CI, and RFC indices enables comprehensive evaluation of ethnobotanical importance by distinguishing culturally salient species (UV, RFC), ailment-specific consensus among informants (ICF, FL), and multipurpose plant use patterns (CI).

3. RESULTS

Within the scope of the study, the findings are presented under two main headings: demographic characteristics and ethnobotanical characteristics. To obtain demographic and ethnobotanical data, face-to-face interviews were conducted with local residents in the Camili Region, and structured questionnaires were administered; the results were evaluated at both district and provincial levels. Participants were grouped according to gender, age, occupational group, and educational level.

In the study area, it was determined that the local community uses 90 different plant taxa belonging to 43 genera and 25 families for various ethnobotanical

purposes. Among the recorded plants, 78 taxa belong to Magnoliopsida, 11 taxa to Liliopsida, and one taxon to Pinopsida. Regarding growth forms, 60 taxa are herbaceous, 8 are trees, 21 are shrubs, and 1 is a climber. In addition to naturally occurring taxa, several cultivated plants that do not grow naturally in the area—such as *Camellia sinensis, Zea mays, Solanum tuberosum*, and *Brassica oleracea*—were also reported to be used by local people.

The most prominent families in terms of the number of commonly used species were Rosaceae (16 species; 17.8%), Polygonaceae (14 species; 15.6%), Hypericaceae (9 species; 10.0%), Primulaceae (8 species; 8.9%), Asteraceae (6 species; 6.7%), and Amaryllidaceae (5 species; 5.6%).

Plant parts utilized by the local population were documented and categorized as flowers, stems, roots, fruits, tassels, resin, bulbs, shoot tips, seeds, aerial parts, leaves, and tubers. The plant taxa used by local residents were listed according to their purposes, including therapeutic use, maintaining health, and nutrition (consumed fresh, dried, or cooked), as well as animal care and health and the production of various household and agricultural tools and implements.

Furthermore, for each regionally known and used plant species, the following quantitative ethnobotanical indices were calculated: Use Value (UV), Informant Consensus Factor (ICF), Cultural Importance Index (CI), Fidelity Level (FL), Use Diversity Index (UDI), Relative Frequency of Citation (RFC), and Healing Index (HI) (Tables 3-5).

3.1. Demographic Characteristics

In the Camili Region, face-to-face interviews were conducted with a total of 34 participants across five villages, and the questionnaires were evaluated separately on a village-by-village basis (Table 1).

Table 1. Demographic characteristics of the surveyed population

Özellikler		*Camili Village*	*%*	*Düzenli Village*	*%*	*Efeler Village*	*%*	*Maral Village*	*%*	*Uğurköy Village*	*%*
Gender	Women	-	-	2	5.9	8	23.5	2	5.9	4	11.8
	Man	8	23.5	-	-	4	11.8	4	11.8	2	5.9
Educational Level	Illiterate	-	-	-	-	2	5.9	-	-	-	-
	Literate	-	-	-	-	2	5.9	-	-	-	-
	Primary school	8	23.5	-	-	8	23.5	2	5.9	4	11.8
	Secondary school	-	-	2	5.9	--	-	-	-	-	-
	High school	-	-	-		-	-	4	11.8	2	5.9
Age Range	35-50	2	5.9	2	5.9	-	-	-	-	2	5.9
	51-65	2	5.9	-	-	8	23.5	-	-	4	11.8
	66-80	4	11.8	-	-	2	5.9	6	17.6	-	-
	81+	-	-	-	-	2	5.9	-	-	-	-
Occupation	Retired	6	17.6	-		2	5.9	6	17.6	2	5.9
	Tradesperson	2	5.9	-		-		-	-	-	-
	Housewife	-	-	2	5.9	8	23.5	-	-	4	11.8
	Civil servant	-	-	-	-	2	5.9	-	-	-	-

Among the local residents living in the five villages of the Camili Region, 47.1% of the respondents were female and 52.9% were male. Participants' ages ranged from 37 to 88 years. Of the respondents, 6 were aged 35–50, 14 were 51–65, 12 were 66–80, and 2 were 81+ years. Overall, nearly 82% of the participants (n = 28) were older than 50 years (Table 1; Figure 2).

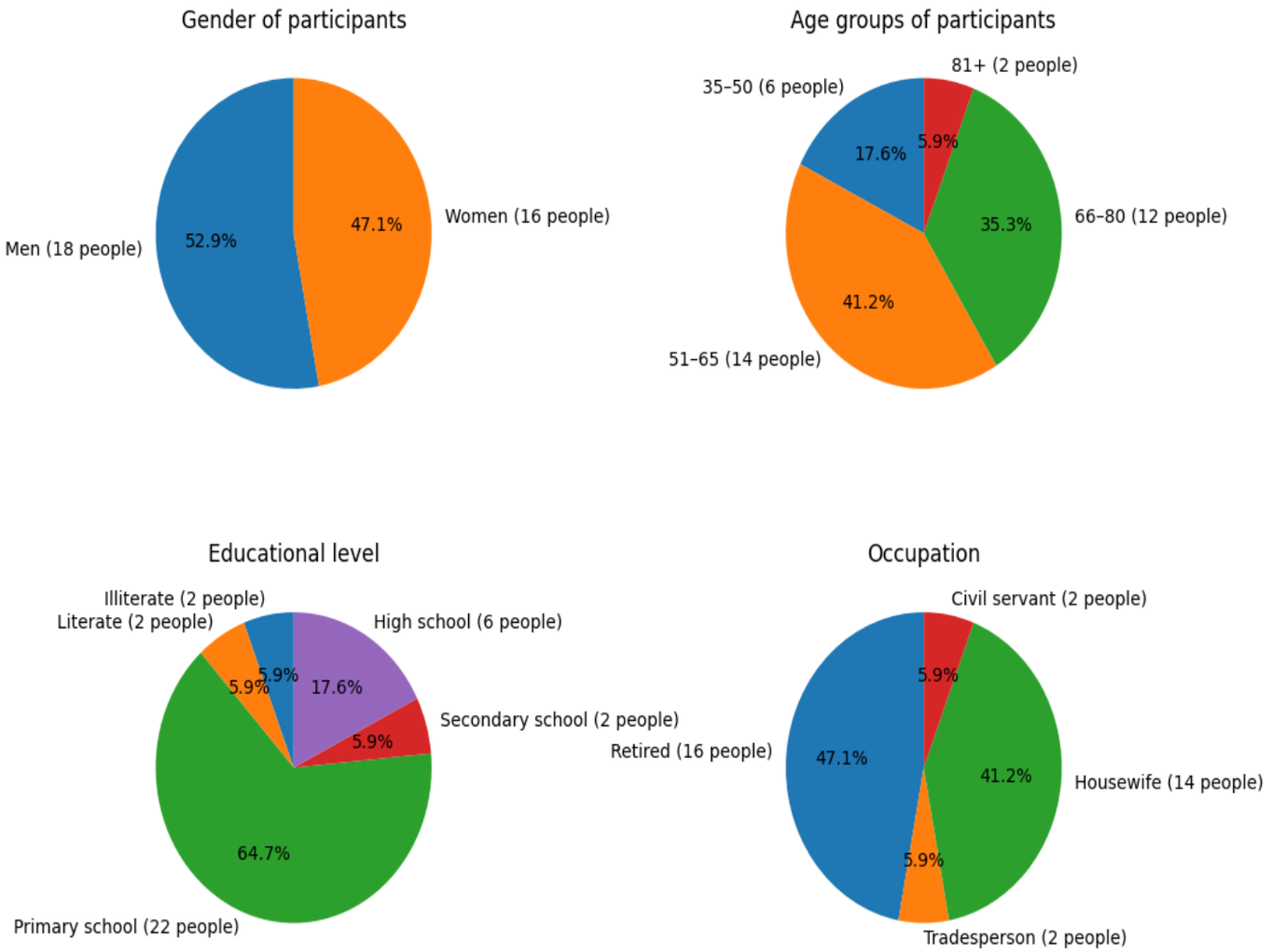

Figure 2. Demographic characteristics of the informants in the study area (age, occupation, education level, and gender)

Of the 34 respondents, only six (17.6%) had completed high school. In addition, 5.9% had completed secondary school, while 64.7% were primary school graduates. Among the respondents, four individuals had never attended school, and two of them were illiterate (Table 1; Fig. 2). When participants were evaluated by occupational group, 47.1% were retirees, 41.2% were housewives, and 5.9% were civil servants and tradespeople. The majority of respondents consisted of housewives and retirees (n = 30) (Table 1; Figure 2).

3.2. Ethnobotanical Characteristics

Based on questionnaire data collected from 34 informants in five villages of the Camili Region (Camili, Efeler, Düzenli, Maral, and Uğurköy), plants reported to be used for various ethnobotanical purposes were compiled and listed at the district level (Table 2). The table presents, for each taxon, the family, scientific name, Turkish name, local vernacular names, parts used, use purposes, and detailed descriptions of uses.

Table 2. Plants used locally in the central district

Family	*Species*	Turkish Name / Local (Vernacular) Name	Part(s) Used	Purpose of Use	Use Description
Amaryllidaceae	*Allium rotundum*		Leaves	Food	Spice
Amaryllidaceae	*Allium rupestre*		Leaves	Food	Cooked as a dish
Amaryllidaceae	*Allium sativum*	Sarımsak	Bulb	Medicinal	Earache; toothache
Amaryllidaceae	*Allium schoenoprasum*	Peynir Sirmosu / İt soğanı	Leaves	Food	Cooked as a dish, turşusu yapılır, Spice
Amaryllidaceae	*Allium szovitsii*		Leaves	Food	Spice
Apiaceae	*Anthriscus sylvestris*	Gımı / Gimi, Ğımi	Aerial part	Food	Stem eaten.
Apiaceae	*Astrantia maxima*	Yıldızca	Flower	Other	Ornamental use
Apiaceae	*Coriandrum sativum*	Kişniş / Kinzi	Seed	Medicinal	Oral ulcer
Apiaceae	*Heracleum sphondylium*	Devesil / Diga, Telehaş	Stem	Other	Animal feed
Asparagaceae	*Ruscus colchicus*	Zemek / Zimerigli, Bazgari	Aerial part	Other	Animal feed
Asteraceae	*Arctium lappa*	Efelek / Galo	Aerial part	Food	Stem eaten.
Asteraceae	*Helichrysum arenarium*	Ölmez çiçek / Altınotu, Nego, Sarıçiçek, Yayla çiçeği, Yayla çayı	Aerial part	Medicinal, Other	Jaundice, Ornamental use
Asteraceae	*Tanacetum coccineum*		Flower	Medicinal	Diabetes
Asteraceae	*Tanacetum macrophyllum*	Koca pireotu	Flower	Medicinal	Diabetes
Asteraceae	*Tanacetum parthenium*	Beyaz papatya, Papatya / Gümüşdüğme	Flower	Medicinal	Diabetes
Asteraceae	*Tussilago farfara*	Öksürük Otu	Aerial part	Medicinal	Wound healing
Betulaceae	*Betula medwediewii*		Branch and shoots	Other	Broom-making
Betulaceae	*Betula pendula*	Huşağacı / Huş	Branch and shoots	Other	Broom-making
Brassicaceae	*Brassica oleracea*	Lahana/ Yayla Lahanası, Karalahana, Diphalay	Leaves	Medicinal, Food	Bone disorders; headache; cooked as a dish
Brassicaceae	*Nasturtium officinale*	Su Teresi / Şağentila	Aerial part	Food	Hemorrhoids; prostate disorders; used in salads
Cannabaceae	*Cannabis sativa*	Kenevir / Kendir	Aerial part	Other	Fiber used for rope-making
Ericaceae	*Vaccinium myrtillus*	Ayı üzümü / Motcvi, Yaban mersini, Mavi yemiş, Likapa, Morsvi, Nigo	Leaves	Food	Hematopoietic/blood-building; used for jam; eaten raw.
Fagaceae	*Quercus hartwissiana*		Leaves	Other	Animal feed
Fagaceae	*Quercus petraea*	Sapsız meşe / Meşe, Pelut	Leaves	Other	Animal feed
Fagaceae	*Quercus pontica*		Leaves	Other	Animal feed
Hypericaceae	*Hypericum androsaemum*	Kamaniça / Kantaron	Flower	Medicinal	Cough suppressant
Hypericaceae	*Hypericum bithynicum*		Flower	Medicinal	Cough suppressant
Hypericaceae	*Hypericum bupleuroides*		Flower	Medicinal	Cough suppressant
Hypericaceae	*Hypericum calycinum*		Flower	Medicinal	Cough suppressant
Hypericaceae	*Hypericum hirsutum*		Flower	Medicinal	Cough suppressant

Table 2. Plants used locally in the central district (continued)

Hypericaceae	*Hypericum linarioides*		Flower	Medicinal	Cough suppressant
Hypericaceae	*Hypericum montanum*		Flower	Medicinal	Cough suppressant
Hypericaceae	*Hypericum orientale*		Flower	Medicinal	Cough suppressant
Hypericaceae	*Hypericum perforatum*	Sarı Kantaron	Flower	Medicinal	Cough suppressant; joint pain; analgesic (pain relief)
Iridaceae	*Crocus kochyanus*	Gezgin çiğdem / Şaşort	Bulb	Food	Cooked as a dish
Iridaceae	*Crocus scharojanii*		Bulb	Food	Cooked as a dish
Iridaceae	*Crocus vallicola*		Bulb	Food	Cooked as a dish
Lamiaceae	*Satureja hortensis*	Çibriska / Kondar	Aerial part	Food	Spice
Lamiaceae	*Thymus nummularius*		Aerial part	Food	Herbal tea
Lamiaceae	*Thymus praecox*	Yayla kekiği / Dağ Kekiği	Aerial part	Food	Spice
Lamiaceae	*Thymus transcaucasicus*		Aerial part	Food	Herbal tea
Malvaceae	*Tilia rubra*	Kafkas ıhlamuru / Ihlamur	Flower	Medicinal	Cough suppressant
Oxalidaceae	*Oxalis acetosella*	Ekşiyonca / Gukumjavay	Leaves	Food	Eaten raw
Pinaceae	*Picea orientalis*	Ladin / Çam	Resin	Medicinal	Cracked hands/feet; burns; wound healing
Plantaginaceae	*Plantago lanceolata*	Damarlıca / Balazağva, Damarlı Ot	Leaves	Medicinal	Boils
Plantaginaceae	*Plantago major*	Sinirotu / Yedi damar otu, Damar otu	Leaves	Medicinal	Boils; anti-inflammatory (to reduce inflammation); urinary tract diseases.
Poaceae	*Zea mays*	Mısır	Tassel	Medicinal	Diuretic
Polygonaceae	*Bistorta carnea*	Dağ lahanası / Pancar	Leaves	Food	Cooked as a dish
Polygonaceae	*Bistorta officinalis*	Bahar pancarı / Yayla Lahanası, Pancar, Diphalay	Leaves	Food	Cooked as a dish
Polygonaceae	*Persicaria amphibia*		Leaves	Food	Cooked as a dish
Polygonaceae	*Persicaria hydropiper*		Leaves	Food	Cooked as a dish
Polygonaceae	*Persicaria maculosa*		Leaves	Food	Cooked as a dish
Polygonaceae	*Polygonum aviculare*		Leaves	Food	Cooked as a dish
Polygonaceae	*Rumex acetosella*	Kuzukulağı / Gukumjavay, Jauta	Leaves	Food	Eaten raw
Polygonaceae	*Rumex alpinus*		Leaves	Food	Eaten raw
Polygonaceae	*Rumex caucasicus*		Leaves	Food	Eaten raw
Polygonaceae	*Rumex crispus*	Labada	Leaves	Food	Eaten raw
Polygonaceae	*Rumex obtusifolius*		Leaves	Food	Eaten raw
Polygonaceae	*Rumex patientia*		Leaves	Food	Eaten raw
Polygonaceae	*Rumex scutatus*		Leaves	Food	Eaten raw
Polygonaceae	*Rumex tuberosus*		Leaves	Food	Eaten raw
Primulaceae	*Cyclamen coum*	Yersomunu / Sklamen, Ayı sabunu	Tuber	Medicinal	Epilepsy
Primulaceae	*Primula algida*		Root	Medicinal	Sinusitis
Primulaceae	*Primula auriculata*	Felç otu / Tutia	Root	Medicinal	Sinusitis
Primulaceae	*Primula elatior*		Root	Medicinal	Sinusitis
Primulaceae	*Primula longipes*		Root	Medicinal	Sinusitis
Primulaceae	*Primula megaseifolia*		Root	Medicinal	Sinusitis
Primulaceae	*Primula veris*	Tutya / Tütiye	Root	Medicinal	Sinusitis

Table 2. Plants used locally in the central district (continued)

Primulaceae	*Primula vulgaris*	Çuhaçiçeği /	Root	Medicinal	Sinusitis
Rosaceae	*Aruncus vulgaris*	Oncorigay	Leaves	Food	Cooked as a dish
Rosaceae	*Cydonia oblonga*	Ayva	Leaves	Medicinal	Cough suppressant
Rosaceae	*Fragaria vesca*	Dağ Çileği / Yabani çilek	Fruit	Food	Jam
Rosaceae	*Laurocerasus officinalis*	Karayemiş	Fruit	medicinal	Diabetes
Rosaceae	*Malus sylvestris*	Yaban elması / Demir Elma	Fruit	Food	Tonsillitis / sore tonsils; used to prepare fruit leather (pestil)
Rosaceae	*Rosa canina*	Kuşburnu	Fruit	medicinal	Cough suppressant
Rosaceae	*Rosa iberica*		Fruit	medicinal	Cough suppressant
Rosaceae	*Rubus caesius*		Fruit	Food	Jam
Rosaceae	*Rubus canescens*		Fruit	Food	Jam
Rosaceae	*Rubus caucasicus*	Zarif böğürtlen / Böğürtlen	Fruit	Food	Jam
Rosaceae	*Rubus discolor*		Fruit	Food	Jam
Rosaceae	*Rubus glandulosus*		Fruit	Food	Jam
Rosaceae	*Rubus idaeus*	Ahududu / İteri, Markvala	Fruit	Food	Jam
Rosaceae	*Rubus platyphyllus*	Siyahcoh / Böğürtlen	Fruit	Food	Jam
Rosaceae	*Rubus sanctus*	Böğürtlen / Şavl Maglava	Fruit	Food	Jam
Rosaceae	*Rubus saxatilis*		Fruit	Food	Jam
Smilacaceae	*Smilax excelca*	Dikenucu / Şikirdazi, Diken, Mağavur	Shoot tip	Food	Cooked as a dish
Solanaceae	*Solanum tuberosum*	Patates	Rhizome	Medicinal	Headache
Theaceae	*Camellia sinensis*	Çay / Siyah çay	Leaves	Medicinal	Carminative
Urticaceae	*Urtica dioica*	Isırgan / Cincar/Çinçar, Gaçvapule, Guçkapuli, Susği	Aerial part	Food	Cooked as a dish; sore throat
Viburnaceae	*Sambucus ebulus*	Mürverotu / Ansli, Kampağa, Hordi, İnci	Leaves	Medicinal	Sprain; bruising/contusion (vascular bruising)

Based on questionnaire data collected from local residents (n = 34) in five villages of the Camili Region, the health conditions for which plants were reported to be used for medicinal purposes were classified into ten main categories, and the Informant Consensus Factor (ICF) and Healing Index (HI) were calculated accordingly (Table 3).

Table 3. Disease categories and informant consensus factor (ICF)

HealthCategory	Nur	Nt	Informant Consensus Factor (ICF)	Healing Index (HI (%))
Cardiovascular diseases	12	1	1,00	1,11
Neurological and psychiatric disorders	8	1	1,00	1,11
Skin diseases	35	5	0,88	5,56
Dental diseases	8	2	0,86	2,22
Urological diseases	10	3	0,78	3,33
General disease	30	8	0,76	8,89
Musculoskeletal diseases	8	3	0,71	3,33
Respiratory diseases	38	13	0,68	14,44
Ear–nose–throat	24	10	0,61	11,11
Digestive diseases	8	4	0,57	4,44

Among the recorded ailment categories, the highest ICF value was calculated for cardiovascular disorders and neurological/psychiatric disorders (1.00). These were followed by skin diseases (0.88), dental diseases (0.86), urological disorders (0.78), general ailments (0.76), musculoskeletal disorders (0.71), respiratory diseases (0.68), ear–nose–throat disorders (0.61), and digestive diseases (0.57) (Table 3).

With respect to the Healing Index (HI), the highest values were observed for respiratory diseases (14.44), ear–nose–throat disorders (11.11), general ailments (8.89), skin diseases (5.56), digestive diseases (4.44), urological disorders (3.33), dental diseases (2.22), followed by neurological/psychiatric disorders and cardiovascular disorders (1.11) (Table 3).

In Artvin, the plant taxa most frequently used by local people for each ailment category were identified. The Fidelity Level (FL)—defined as the percentage ratio of the number of informants reporting the same medicinal use for a given species to the total number of informants reporting any medicinal use of that species—indicates the intensity and specificity of use within a particular ailment category. Plant species showing notable use intensity for the defined ailment categories are presented in Table 4.

Table 4. Ethnobotanical Evaluation of Medicinal Plants Using Fidelity Level (FL)

HealthCategory	Species	Np	N	FL (%)
Skin diseases	*Nasturtium officinale*	2	4	50,00
	Picea orientalis	20	20	100,00
	Plantago lanceolata	1	2	50,00
	Plantago major	10	16	62,50
	Tussilago farfara	2	2	100,00
Dental diseases	*Allium sativum*	2	2	100,00
	Coriandrum sativum	6	6	100,00
General ailments	*Brassica oleracea*	2	6	33,33
	Hypericum perforatum	8	12	66,67
	Laurocerasus officinalis	8	8	100,00
	Sambucus ebulus	2	4	50,00
	Solanum tuberosum	2	2	100,00
	Tanacetum coccineum	2	2	100,00
	Tanacetum macrophyllum	2	2	100,00
	Tanacetum parthenium	4	4	100,00
Cardiovascular diseases	*Vaccinium myrtillus*	12	16	75,00
	Brassica oleracea	2	6	33,33
	Hypericum perforatum	2	12	16,67
	Sambucus ebulus	4	4	100,00
Ear–nose–throat	*Allium sativum*	2	2	100,00
	Malus sylvestris	6	12	50,00
	Primula algida	2	2	100,00
	Primula auriculata	2	2	100,00
	Primula elatior	2	2	100,00
	Primula longipes	2	2	100,00
	Primula megaseifolia	2	2	100,00
	Primula veris	2	2	100,00
	Primula vulgaris	2	2	100,00
	Urtica dioica	2	20	10,00
Neurological and psychiatric disorders	*Cyclamen coum*	8	8	100,00
Digestive diseases	*Camellia sinensis*	2	2	100,00
	Helichrysum arenarium	2	4	50,00
	Primula auriculata	2	2	100,00
	Primula vulgaris	2	2	100,00
Respiratory diseases	*Cydonia oblonga*	6	6	100,00
	Hypericum androsaemum	2	2	100,00
	Hypericum bithynicum	2	2	100,00
	Hypericum bupleuroides	2	2	100,00
	Hypericum calycinum	2	2	100,00
	Hypericum hirsutum	2	2	100,00
	Hypericum linarioides	2	2	100,00
	Hypericum montanum	2	2	100,00
	Hypericum orientale	2	2	100,00
	Hypericum perforatum	2	12	16,67
	Rosa canina	6	6	100,00
	Rosa iberica	2	2	100,00
	Tilia rubra	6	6	100,00
Urological diseases	*Nasturtium officinale*	2	4	50,00
	Plantago major	6	16	37,50
	Zea mays	2	2	100,00

An examination of the Fidelity Level (FL) values indicates that several taxa stand out due to their high use intensity, with FL = 100%. These include *Picea orientalis* for skin diseases (20 UR; FL 100%), *Laurocerasus officinalis* and *Tanacetum parthenium* for general ailments (both FL 100%), *Sambucus ebulus* for cardiovascular disorders (FL 100%), *Cyclamen coum* for neurological/psychiatric disorders (FL 100%), and *Cydonia oblonga, Rosa canina*, and *Tilia rubra* for respiratory diseases (each FL 100%) (Table 4).

In contrast, *Hypericum perforatum, Brassica oleracea, Plantago major, Nasturtium officinale, Allium sativum, Urtica dioica*, and some *Primula* species were reported across multiple health categories, suggesting that these taxa function as more general-purpose medicinal plants within the local pharmacopoeia (Table 5).

Table 5. Different usage indices of medicinal and aromatic plants

Species	Familya	Use Reports	Informants	UV	RFC	CI	UDI
Allium schoenoprasum	Amaryllidaceae	6	2	3,00	0,06	0,18	6,00
Allium sativum	Amaryllidaceae	4	2	2,00	0,06	0,12	4,00
Primula auriculata	Primulaceae	4	2	2,00	0,06	0,12	4,00
Primula vulgaris	Primulaceae	4	2	2,00	0,06	0,12	4,00
Nasturtium officinale	Brassicaceae	6	4	1,50	0,12	0,18	3,00
Sambucus ebulus	Viburnaceae	6	4	1,50	0,12	0,18	6,00
Picea orientalis	Pinaceae	20	20	1,00	0,59	0,59	20,00
Urtica dioica	Urticaceae	20	20	1,00	0,59	0,59	10,00
Plantago major	Plantaginaceae	16	16	1,00	0,47	0,47	16,00
Vaccinium myrtillus	Ericaceae	16	16	1,00	0,47	0,47	8,00
Thymus praecox	Lamiaceae	14	14	1,00	0,41	0,41	14,00
Hypericum perforatum	Hypericaceae	12	12	1,00	0,35	0,35	12,00
Malus sylvestris	Rosaceae	12	12	1,00	0,35	0,35	6,00
Cyclamen coum	Primulaceae	8	8	1,00	0,24	0,24	8,00
Laurocerasus officinalis	Rosaceae	8	8	1,00	0,24	0,24	8,00
Brassica oleracea	Brassicaceae	6	6	1,00	0,18	0,18	3,00
Coriandrum sativum	Apiaceae	6	6	1,00	0,18	0,18	6,00
Cydonia oblonga	Rosaceae	6	6	1,00	0,18	0,18	6,00
Rosa canina	Rosaceae	6	6	1,00	0,18	0,18	6,00
Tilia rubra	Malvaceae	6	6	1,00	0,18	0,18	6,00
Bistorta officinalis	Polygonaceae	4	4	1,00	0,12	0,12	4,00
Fragaria vesca	Rosaceae	4	4	1,00	0,12	0,12	4,00
Helichrysum arenarium	asteraceae	4	4	1,00	0,12	0,12	2,00
Smilax excelca	Smilacaceae	4	4	1,00	0,12	0,12	4,00
Tanacetum parthenium	Asteraceae	4	4	1,00	0,12	0,12	4,00
Allium rotundum	Amaryllidaceae	2	2	1,00	0,06	0,06	2,00
Allium rupestre	Amaryllidaceae	2	2	1,00	0,06	0,06	2,00
Allium szovitsii	Amaryllidaceae	2	2	1,00	0,06	0,06	2,00
Anthriscus sylvestris	Apiaceae	2	2	1,00	0,06	0,06	2,00
Arctium lappa	Asteraceae	2	2	1,00	0,06	0,06	2,00
Aruncus vulgaris	Rosaceae	2	2	1,00	0,06	0,06	2,00
Astrantia maxima	Apiaceae	2	2	1,00	0,06	0,06	2,00
Betula medwediewii	Betulaceae	2	2	1,00	0,06	0,06	2,00
Betula pendula	Betulaceae	2	2	1,00	0,06	0,06	2,00
Bistorta carnea	Polygonaceae	2	2	1,00	0,06	0,06	2,00
Camellia sinensis	Theaceae	2	2	1,00	0,06	0,06	2,00
Cannabis sativa	Cannabaceae	2	2	1,00	0,06	0,06	2,00
Crocus kochyanus	Iridaceae	2	2	1,00	0,06	0,06	2,00
Crocus scharojanii	Iridaceae	2	2	1,00	0,06	0,06	2,00
Crocus vallicola	Iridaceae	2	2	1,00	0,06	0,06	2,00
Heracleum sphondylium	Apiaceae	2	2	1,00	0,06	0,06	2,00
Hypericum androsaemum	Hypericaceae	2	2	1,00	0,06	0,06	2,00

Table 5. Different usage indices of medicinal and aromatic plants (continued)

Hypericum bithynicum	Hypericaceae	2	2	1,00	0,06	0,06	2,00
Hypericum bupleuroides	Hypericaceae	2	2	1,00	0,06	0,06	2,00
Hypericum calycinum	Hypericaceae	2	2	1,00	0,06	0,06	2,00
Hypericum hirsutum	Hypericaceae	2	2	1,00	0,06	0,06	2,00
Hypericum linarioides	Hypericaceae	2	2	1,00	0,06	0,06	2,00
Hypericum montanum	Hypericaceae	2	2	1,00	0,06	0,06	2,00
Hypericum orientale	Hypericaceae	2	2	1,00	0,06	0,06	2,00
Oxalis acetosella	Oxalidaceae	2	2	1,00	0,06	0,06	2,00
Persicaria amphibia	Polygonaceae	2	2	1,00	0,06	0,06	2,00
Persicaria hydropiper	Polygonaceae	2	2	1,00	0,06	0,06	2,00
Persicaria maculosa	Polygonaceae	2	2	1,00	0,06	0,06	2,00
Plantago lanceolata	Plantaginaceae	2	2	1,00	0,06	0,06	2,00
Polygonum aviculare	Polygonaceae	2	2	1,00	0,06	0,06	2,00
Primula algida	Primulaceae	2	2	1,00	0,06	0,06	2,00
Primula elatior	Primulaceae	2	2	1,00	0,06	0,06	2,00
Primula longipes	Primulaceae	2	2	1,00	0,06	0,06	2,00
Primula megaseifolia	Primulaceae	2	2	1,00	0,06	0,06	2,00
Primula veris	Primulaceae	2	2	1,00	0,06	0,06	2,00
Quercus hartwissiana	Fagaceae	2	2	1,00	0,06	0,06	2,00
Quercus petraea	Fagaceae	2	2	1,00	0,06	0,06	2,00
Quercus pontica	Fagaceae	2	2	1,00	0,06	0,06	2,00
Rosa iberica	Rosaceae	2	2	1,00	0,06	0,06	2,00
Rubus caesius	Rosaceae	2	2	1,00	0,06	0,06	2,00
Rubus canescens	Rosaceae	2	2	1,00	0,06	0,06	2,00
Rubus caucasicus	Rosaceae	2	2	1,00	0,06	0,06	2,00
Rubus discolor	Rosaceae	2	2	1,00	0,06	0,06	2,00
Rubus glandulosus	Rosaceae	2	2	1,00	0,06	0,06	2,00
Rubus idaeus	Rosaceae	2	2	1,00	0,06	0,06	2,00
Rubus platyphyllus	Rosaceae	2	2	1,00	0,06	0,06	2,00
Rubus sanctus	Rosaceae	2	2	1,00	0,06	0,06	2,00
Rubus saxatilis	Rosaceae	2	2	1,00	0,06	0,06	2,00
Rumex acetosella	Polygonaceae	2	2	1,00	0,06	0,06	2,00
Rumex alpinus	Polygonaceae	2	2	1,00	0,06	0,06	2,00
Rumex caucasicus	Polygonaceae	2	2	1,00	0,06	0,06	2,00
Rumex crispus	Polygonaceae	2	2	1,00	0,06	0,06	2,00
Rumex obtusifolius	Polygonaceae	2	2	1,00	0,06	0,06	2,00
Rumex patientia	Polygonaceae	2	2	1,00	0,06	0,06	2,00
Rumex scutatus	Polygonaceae	2	2	1,00	0,06	0,06	2,00
Rumex tuberosus	Polygonaceae	2	2	1,00	0,06	0,06	2,00
Ruscus colchicus	Asparagaceae	2	2	1,00	0,06	0,06	2,00
Satureja hortensis	Lamiaceae	2	2	1,00	0,06	0,06	2,00
Solanum tuberosum	Solanaceae	2	2	1,00	0,06	0,06	2,00
Tanacetum coccineum	Asteraceae	2	2	1,00	0,06	0,06	2,00
Tanacetum macrophyllum	Asteraceae	2	2	1,00	0,06	0,06	2,00
Thymus nummularius	Lamiaceae	2	2	1,00	0,06	0,06	2,00
Thymus transcaucasicus	Lamiaceae	2	2	1,00	0,06	0,06	2,00
Tussilago farfara	Asteraceae	2	2	1,00	0,06	0,06	2,00
Zea mays	Poaceae	2	2	1,00	0,06	0,06	2,00

In Table 5, calculations of Use Value (UV), Cultural Importance Index (CI), Use Diversity Index (UDI), and Relative Frequency of Citation (RFC) are presented for the medicinal plant species recorded in the study area. The highest RFC and CI values were observed for *Picea*

orientalis and *Urtica dioica*, indicating their prominent cultural importance and widespread use among informants, while *Plantago major, Vaccinium myrtillus, Thymus praecox*, and *Hypericum perforatum* also showed high use reports and informant consensus.

In this field study conducted in the Camili Region, the plant parts most frequently used for various medicinal purposes were, in descending order: leaves (78 uses), aerial parts (72 uses), fruits (64 uses), flowers (44 uses), resin (20 uses), roots (18 uses), bulbs and tubers (10 uses), seeds (8 uses), shoots/shoot tips (8 uses), and stems and tassels (2 uses).

When evaluated by use category, the health/medicinal category showed the highest use of flowers (42 uses),

followed by fruits (36), aerial parts (24), leaves (22), resin (20), roots (18), tubers (10), seeds (8), bulbs (4), and tassels (2). In the food category, the most frequently used plant part was leaves (50 uses), followed by aerial parts (42), fruits (28), bulbs (6), shoot tips (4), and stems (2) (Figure 3).

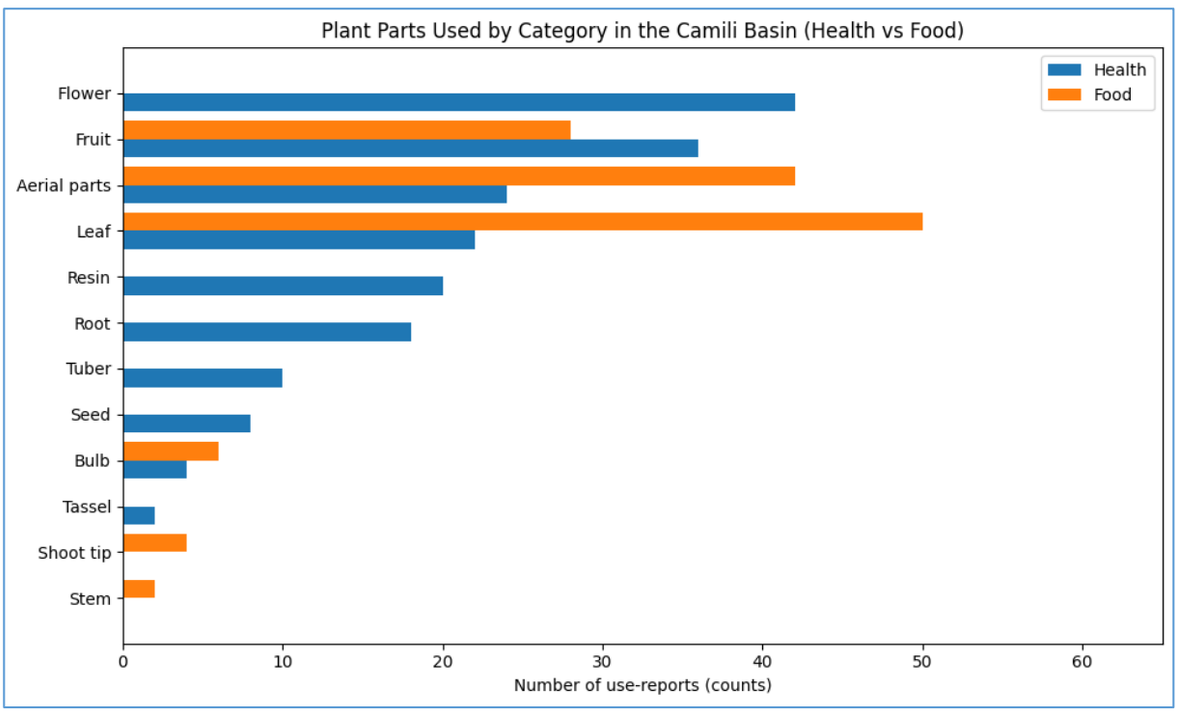

Figure 3. The usage quantities of the identified medicinal-aromatic plant parts

This study provides the first comprehensive documentation of Biodiversity-Based Traditional Knowledge (BBTK) in five villages of the Camili Region (Borçka, Artvin), an area of high biological importance that has been poorly represented in previous ethnobotanical studies. Unlike earlier studies conducted in nearby regions, this research presents quantitative and systematically collected ethnobotanical data based on 336 use-reports obtained from long-term fieldwork between 2021 and 2023.

4. DISCUSSION

In the Camili Region, located in the Borçka district of Artvin Province, the village headmen (muhtars) were consulted in each of the five villages, and—taking population density into account—the individuals to be included in the study were identified. Data collection was carried out through face-to-face interviews using a structured questionnaire.

As a result of interviews with 34 informants, traditional uses were recorded for 90 plant taxa belonging to 43 genera and 25 families, yielding 336 questionnaire records. For analytical purposes, these data were

transferred into a digital database and organized in Microsoft Excel. Information obtained from local residents indicated that plants are used not only for medicinal purposes, but also for food and spice, livestock health and productivity (e.g., oil, milk, and meat yield), handicrafts, and the manufacture of various tools and implements.

Within the study area, the most frequently used plant parts were, respectively, leaves, aerial parts, fruits, and flowers. When compared with the literature, leaves are commonly reported as the most preferred plant part, often administered in the form of infusions (Davis, 1965–1985; Akan et al., 2008; Akbulut & Özkan, 2014; Mwafongo et al., 2017; Hussein & Dhabe, 2018; Akbulut et al., 2019). In this respect, our findings regarding both the plant parts used and preparation/administration methods are consistent with previous studies.

In the study area, a total of five plant taxa were reported to be used as spices at different intensities by local people: *Allium rotundum, A. schoenoprasum, A. szovitsii, Satureja hortensis*, and *Thymus praecox*. Similar results were reported in a previous study conducted in the central district of Artvin (Erşen Bak & Çifci, 2022).

The presence of plants whose leaves and aerial parts are predominantly used as food—commonly prepared by sautéing with onions (Figure 3)—has also been documented in earlier studies (Akgül, 2008; Saraç et al., 2013; Deniz et al., 2010; Akbulut & Özkan, 2014; Karakurt, 2014; Tekin, 2022).

Among the recorded species, the highest number of reports concerned uses for respiratory diseases (38 records) and skin diseases (35 records), indicating that the documented taxa are widely utilized both medicinally and as food. For respiratory diseases, the most frequently cited species were *Tilia rubra* (6 records), *Cydonia oblonga* (6 records), and *Rosa canina* (6 records). For skin diseases, *Picea orientalis* (20 records) and *Plantago major* (10 records) were the most frequently cited taxa. These plants have also been reported for similar purposes in comparable studies (Karakaya et al., 2019; Nadiroğlu et al., 2019; Mumcu & Korkmaz, 2018; Karcı et al., 2017; Sağıroğlu et al., 2017; Bağcı et al., 2016; Macit & Köse, 2015; Karakurt, 2014; Korkmaz & Karakurt, 2014; Saraç et al., 2013; Polat, 2013; Tangjitman et al., 2013; Tetik et al., 2013; Özkan & Akbulut, 2012; Sağıroğlu et al., 2012; Aktan, 2011; Öztürk & Ölçülü, 2011; Tetik, 2011; Altundağ & Öztürk, 2011; Koyuncu, 2009; Metin, 2009; Tıta et al., 2009; Yeşil & Akalın, 2009; Birinci, 2008; Kızılarslan, 2008; Satıl et al., 2008; Gençay, 2007; Bulut, 2006; Ezer, 2006; Mart, 2006; Onar, 2006; Tuzlacı, 2006; Arslan, 2005; Koyuncu, 2005; Özdemir, 2005; Akçiçek and Vural, 2003; Arslan, 2002; Tuzlacı, 2002; Sezik et al., 2001; Altan and Alçıtepe, 2001; Baytop, 1999; Koçak, 1999; Duran, 1998; Eryaşar, 1998).

Among the taxa used as construction or craft material, the wood of *Betula medwediewii* and *B. pendula* is used in basket-making. Similar uses have been documented in ethnobotanical studies conducted in other regions (Özkan and Akbulut, 2012; Bulut, 2008; Koyuncu, 2005).

Finally, the ethnobotanical findings from the study area were compared with studies conducted in nearby localities in terms of use patterns and preparation methods (Table 6).

Table 6. Comparison of the potential of medicinal and aromatic plants in nearby areas

	Medicinal	Food	Spice	Construction material	Animal feed	Religious belief	Other purposes	Total number of taxa
This study	41	46	3	3	4	-	-	90
Akbulut & Zengin (2023)	51	29	5	5	4	2	3	51
Zengin (2020)	48	26	5	5	3	2	6	74
Karaköse et. al. (2019)	29	-	-	-	-	-	-	29
Karakaya et. al. (2019)	98	35	10	-	-	-	13	98
Karakurt (2014)	132	97	-	12	35	-	50	183
Saraç et. al. (2013)	78	43	8	25	19	-	26	113
Tekin (2011)	62	60	-	9	28	-	33	140

Comparison of the taxa used for medicinal purposes in the study area with those reported in studies from nearby areas (Table 7).

Differences in plant use were observed between women and men, with women showing greater knowledge related to food preparation, herbal teas, and household remedies, while men were more frequently associated with plant uses linked to forestry, agriculture, and animal husbandry, reflecting a gender-based division of traditional knowledge within the study area.

Table 7. Comparison of taxa used for medical purposes in the field of study with studies in related fields

Title of the study	Number of medicinal taxa	Families with the highest number of taxa	Most common use category	Most widely used species
This study	90	Rosaceae Polygonaceae Hypericaceae Primulaceae	Respiratory diseases Skin diseases General ailments	*Picea orientalis* *Urtica dioica* *Vaccinium myrtillus* *Plantago major* *Thymus praecox* *Hypericum perforatum* *Malus sylvestris*
Akbulut & Zengin (2023)	51	Asteraceae Lamiaceae Apiaceae	Food Spice Respiratory diseases Diabetes Gastrointestinal diseases	*Malva neglecta* *Plantago majör* *Rosa iberica* *Vaccinium myrtillus* *Urtica dioica* *Crataegus orientalis* *Helichrysum plicatum*
Zengin (2020)	48	Asteraceae Lamiaceae Apiaceae	Wound healing Diabetes Expectorant	*Malva neglecta* *Plantago major* subsp. *Polygonum aviculare*
Karaköse et. al. (2019)	29	Rosaceae Asteraceae Lamiaceae	Common cold Influenza Respiratory diseases	*Rosa canina* *Mentha longifolia* *Juglans regia*
Karakaya et. al. (2019)	98	Asteraceae Lamiaceae Apiaceae	Gastrointestinal disorders Used for wound healing Respiratory disorders	*Malva neglecta* *Prangos ferulacea*
Karakurt (2014)	132	Asteraceae Lamiaceae Rosaceae	Skin diseases Diabetes Cough	No species-level determination has been made
Saraç et. al. (2013)	78	Asteraceae Rosaceae Lamiaceae	Stomach disorders Hemorrhoids Respiratory tract disorders	*Camellia sinensis* *Laurocerasus officinalis* *Sambucus ebulus*
Tekin (2011)	62	Asteraceae Fabaceae Rosaceae	Food Animal feed	*Vitis vinifera* *Anethum graveolens* *Petroselinum crispum*

5. CONCLUSIONS AND RECOMMENDATIONS

This study was conducted between 2021 and 2023 in the villages of Camili, Efeler, Düzenli, Maral, and Uğurköy within the Camili Region (Borçka District, Artvin Province). Plant species used as traditional folk remedies were documented with the aim of helping to preserve this original local knowledge and facilitate its transmission to future generations. The findings may also provide a valuable basis for further research in fields such as modern medicine, phytotherapy, and pharmacology.

The study was based on face-to-face interviews with 34 informants. A total of 336 questionnaire records were obtained and subsequently digitized and organized in Microsoft Excel for analysis. Of the participants, 18 were male (52.9%) and 16 were female (47.1%). Age distribution was as follows: 35–50 years (n = 6; 17.6%), 51–65 years (n = 14; 41.2%), 66–80 years (n = 12; 35.3%), and 80+ years (n = 2; 5.9%). In terms of occupation, 16 participants (47.1%) were retired, 14 (41.2%) were housewives, 2 (5.9%) were tradespeople, and 2 (5.9%) were civil servants. Regarding educational level, 2 individuals (5.9%) were illiterate, 2 (5.9%) were literate without formal schooling, 22 (64.7%) had primary school education, 2 (5.9%) had secondary school education, and 6 (17.6%) were high school graduates.

Based on the evaluation of collected taxa and associated ethnobotanical information, a total of 90 taxa belonging to 43 genera and 25 families were recorded. In the health/medicinal category, the most frequently used plant parts were flowers (42 use reports), followed by fruits (36), aerial parts (24), leaves (22), resin (20), roots (18), tubers (10), seeds (8), bulbs (4), and tassels (2). In the food category, the most frequently used parts were leaves (50), followed by aerial parts (42), fruits (28), bulbs (6), shoot tips (4), and stems (2).

The distribution of the recorded taxa by families (from the richest to the least) was as follows: Rosaceae (16 species; 17.8%), Polygonaceae (14; 15.6%), Hypericaceae (9; 10.0%), Primulaceae (8; 8.9%), Asteraceae (6; 6.7%), Amaryllidaceae (5; 5.6%), Apiaceae and Lamiaceae (4 each; 4.4%), Fagaceae and Iridaceae (3 each; 3.3%), and Betulaceae, Brassicaceae, and Plantaginaceae (2 each; 2.2%).

Across ailment categories, plants were most frequently used for respiratory system disorders (20.9%), skin diseases (19.8%), general ailments (16.5%), ear–nose–throat disorders (13.2%), cardiovascular disorders (6.6%), and urological disorders (5.5%), followed by dental diseases, musculoskeletal disorders, neurological/psychiatric disorders, and digestive system disorders (each 4.4%).

The most widely known species in the area—also characterized by broad patterns of use—were *Picea orientalis, Urtica dioica, Vaccinium myrtillus, Plantago major, Thymus praecox, Hypericum perforatum*, and *Malus sylvestris*. During the study, emphasis was placed on informing participants that medicinal plant use in folk practice should be approached with caution.

This research aimed to clarify the prevalence and patterns of plant use among local residents in the Camili Region. Based on interviews and field observations, the use of plants for treatment remains common today, comparable to past practices. However, the younger generation was found to have substantially lower interest in and use of medicinal plants than the older population. This decline is thought to be associated with a gradual reduction in accurate intergenerational knowledge transfer over time, as well as the widespread availability and accessibility of modern healthcare services. The information documented here may serve as a comprehensive resource for future generations and support the continuity of traditional knowledge.

Ethnobotanical and traditional folk medicine studies conducted across different regions have produced an accumulating body of knowledge that demonstrates the cultural richness and scientific potential of Türkiye in this field. These data not only contribute to cultural heritage but may also inform the discovery and development of therapeutics in modern medicine. Nevertheless, the expansion of technology and transportation, the increasing prevalence of modern medical approaches, and multiple drivers of habitat loss (e.g., urbanization, conversion to agricultural land, herbicide use) may accelerate the disappearance of traditional knowledge across generations. In this context, the present study contributes to sustaining this knowledge base.

However, many regions in Türkiye still lack systematic documentation of local ethnobotanical knowledge. Therefore, scientific ethnobotanical research should be initiated in understudied areas before traditional healing practices are lost; appropriate funding mechanisms should be developed; and the resulting knowledge

should be preserved and transmitted to future generations.

In ethnobotanical research, close collaboration with local communities is essential. Active communication may be required to develop a deep understanding of local plant knowledge, usage habits, and cultural practices. In future studies, one-to-one engagement should be maintained and the accuracy of questionnaire data should be verified using complementary documentation methods such as written records, photographs, video recordings, or other media formats. During plant collection, vegetation should be carefully observed and the ecological contexts of local taxa should be assessed. In addition, chemical analyses of plant materials and the use of modern analytical techniques are recommended to better understand biological effects and potential medicinal applications. Future research may also examine how local plant use changes over time and evaluate the impacts of modernization and cultural transformation, which is important for understanding the sustainability of traditional knowledge and community adaptation strategies.

The Camili Biosphere Reserve necessitates sustainable management of plant resources due to its high biodiversity and rich traditional knowledge base. Species with high RFC and FL values in this study are taxa heavily used by the local population and are culturally significant, indicating that these species may face overharvesting and population pressure. In this context, controlled and seasonal harvesting practices, collection methods that consider the plant's regenerative capacity, and educational programs aimed at raising awareness among the local population are crucial, especially for species used for medicinal and aromatic purposes. Furthermore, classifying taxa with high frequency of use and specific use value as "priority conservation species" will contribute to the development of a balanced management strategy between traditional use and biodiversity conservation in the Camili Biosphere Reserve.

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