Research paper

An ethnobotanical study of medicinal plants in Güce district, north-eastern Turkey

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Abstract

This study aims to identify medicinal plants traditionally used to treat diseases by local people living in Güce district, north-eastern Turkey. The study was carried out between 2018 and 2021 using a two-part semi-structured, open-ended questionnaire with 165 local people. Data were analysed using use-report, frequency of citation, and informant consensus factor. Informants identified 128 vascular medicinal plant taxa belonging to 54 families and 106 genera. The most common plant taxa belong to Rosaceae (16 taxa/12.5%), Asteraceae (12 taxa/9.4%), and Lamiaceae (9 taxa/7%) families. The most frequently used preparation method reported was decoction (39.8%); the most commonly utilized plant parts were leaves (40.3%). Statistical analysis reveals that women in Güce district (df = 163, p = 0.043 < 0.05) possess the most traditional knowledge. The highest frequency of citation (61) and use report (92) were recorded for Tilia rubra subsp. caucasica, and the highest informant consensus factors were cited for respiratory system disorders (0.86), digestive system disorders (0.73), and skin disorders (0.71). This study reported nine plant taxa as medicinal plants for the first time, and documented a total of 293 new therapeutic uses. However, the study indicates that the transfer of traditional knowledge to future generations is limited (F = 3.355, p = 0.020). Action should be taken as soon as possible to preserve existing traditional knowledge and to ensure its transfer to future generations.

1. Introduction

Of the 17 sustainable development goals adopted by the Member States at the United Nations General Assembly in September 2015 at least seven are related to traditional knowledge (TK) (Kumar et al., 2021), the product and whole of the interaction of the individual and society with nature (Berkes, 1993). However, TK is being lost throughout the world (Ramirez, 2007). Thus, documentation of TK is important to safeguard the rights of local people during an era of globalization (see Article 8 of the Convention on Biological Diversity (CBD) and strategic goal E of Nagoya Protocol; Ghimire et al., 2018). TK, which has a close relationship with biodiversity (Idolo et al., 2010; Aswani et al., 2018), also has the potential to contribute to scientific knowledge for the conservation and sustainable use of biodiversity, and thus, ecosystems (Gaoue et al., 2017). Accordingly, preserving TK of natural flora has become a central focus of ethnobotany (Berkes et al., 1995, 2000; Mustafa et al., 2012; Dalar et al., 2018; Söükand and Pieroni, 2019; Hu et al., 2020; Mattalia et al., 2021). Ethnobotanists have documented the use of plants in customs/traditions, folk nutrition, folk cuisine, and folk medicine in different parts of the world (Özdemir, 2018; Karaköse et al., 2019; Pei et al., 2020). These studies both help conserve TK and expedite the discovery of new drugs, as natural plant biodiversity in many regions provides rapid, cheap, and sufficient alternative resources for healthcare of local people (Kathambi et al., 2020). Importantly, protecting TK of plants (e.g., medicinal plant use) requires identification of both plant taxa and an understanding of which members of a community possess TK (Mathur, 2003). TK is abundant in Turkey, a region that has hosted many civilizations that have left their cultural, social, and ecological richness as a heritage (Yıldırım, 2004; Kendir and Güvenc, 2010). Turkey is located at the intersection of three phytogeographical regions (Circumboreal, Mediterranean, and Irano-Turanian) and three of the world’s 36 biodiversity hotspots (Mediterranean Basin, Irano-Anatolian, and Caucasus biodiversity hotspots) (Myers et al., 2000; Mittermeier et al., 2004). It has complex topography, climate, and soil differences. Consequently, Turkey has approximately...
12,975 plant taxa and nearly 4175 endemic plants (with an endemic rate of 32%) (Davis, 1965–1985; Davis et al., 1988; Güner et al., 2000, 2012; Ozhatay et al., 2019; Karaköse, 2020). In addition to this biodiversity, Turkey has a high degree of TK related to medicinal plant use (Karaköse and Terzioglu, 2019, 2020). However, modernization in Turkey is gradually displacing TK (Kızılarslan and Ozhatay, 2012).

Although ethnobotanical studies have been conducted in Turkey since the beginning of the Republican period (Baytop, 1999), their number has increased considerably in the last two decades (Çakırcıoğlu et al., 2011; Polat and Satlı, 2012; Polat et al., 2013; Sargin et al., 2013, 2015; Tetik et al., 2013; Akbulut and Özkan, 2014; Hayta et al., 2014; Güzel et al., 2015; Gunes, 2017; Akbulut et al., 2019; Karaköse et al., 2019; Sargin and Büyükçengiz, 2019; Kawarty et al., 2020). In 2017, the Biological Diversity of Department of the General Directorate of Nature Conservation and National Parks began a project on “Registration of Traditional Knowledge Associated with Biodiversity”, which will cover 81 provinces in Turkey, and create a “Traditional Knowledge Management System” available to researchers. Thus far, only a limited number of ethnobotanical studies have been carried out in the Giresun province (Polat et al., 2015; Güler et al., 2021).

Giresun is a mountainous and rugged region with habitats important for biodiversity. It harbors the Euxine–Caucasian broadleaf and Caucasus mixed forests, which belong to the Caucasus biodiversity hotspot (Karaköse, 2019) and are classified as one of 200 Global Ecoregions (WWF and IUCN, 1994; Akbulut and Kürdür, 2015). Districts within this region (e.g., Güce district) have been affected by the increasing global demand for natural resources, which has fragmented and reduced natural habitats. Habitat and biodiversity loss threaten the ability of local people to maintain, use and transfer TK to future generations. Thus, it is critical to record and scientifically evaluate the high biological and socio-cultural richness of the TK in places such as Güce.

This study aims to identify medicinal plants traditionally used to treat diseases by local people living in the Güce district, north-eastern Turkey. In addition, I determined whether TK of these plants differs depending on the gender, age, and education level of informants. This is the first ethnobotanical study carried out in Giresun’s Güce district. The comprehensive quantitative, qualitative, and statistical evaluations of this study will contribute to the TK associated with biodiversity in Turkey.

2. Material and methods

2.1. Study area

Güce, one of Giresun’s eastern districts, is surrounded by the Tirebolu district to the north, south, and east, and the Espiye district to the west (Fig. 1). “Güce” is a Turkish word meaning “broken wheat, split corn, vetch”. Some local studies have associated this word with the word “küçe”, which means small (http://guce.gov.tr/tarih). The settlement of the district began in 2000 BCE, before the conquest of the Muslim Turks. During the attacks before the Anatolian Seljuks, Turkish clans, including the Eymür, Halaç, Aşvar, and Kıpchaks, settled in the region. Turkish clans are known to have migrated to the Güce region from Asia. Güce, an intersection of important historical roads, is also one of the meeting centers of the region (Kaya, 2019). The conquest, settlement, and Islamization of the geography, including the Güce district (after the 10th century), was realized by the Chepni Turks, one of the 24 clans of the Oğuz Turks (http://www.guce.bel.tr/sayfa/tarihce/cev.html). Established on rough lands, Güce is a settlement unit connected to Tirebolu, which was the only town in the vicinity until the 20th century. The municipality organization was established in 1990 in Güce, which is a center connecting the surrounding villages (Kaya, 2019). The local language in the region is Turkish. The district is located in the south, about 15 km from the coast, and between 40°–53° northern latitudes and 38°–48° eastern longitudes; the elevation of the district varies between 50 and 2650 m. In 2021, the population of Güce was 8098. This population consists of 4131 (51%) men and 3967 (48.99%) women (https://data.tuik.gov.tr/).

The local people of Güce mostly earn their living from agriculture, animal husbandry, beekeeping, and forestry. In terms of agriculture, local people primarily grow small-scale agricultural products such as corn, cabbage, and bean for their own needs. The wild cherry tree Prunus avium (L.) L. (Syn.: Cerasus avium (L.) Moench) originated in Giresun. For this reason, its former name “Kerasous or Cerasus” derives from the word cherry. Additional agricultural sources of income for the people of Güce include hazelnut and tea farming, which contribute greatly to the Turkish economy (Fig. 2a). Giresun’s primary source of incomes are the Corylus spp. The highest quality hazelnuts in the world are grown in Giresun province. Livestock and dairy products such as butter, yoghurt, and cheese are produced, and honey production is very popular in the region. Some people also earn income from forestry activities (cutting, plantation, silviculture, etc.).

2.2. Vegetation structure

The forests in Güce district are managed by the Güce Forest Enterprise, which is administratively affiliated with the Tirebolu Forestry Management Directorate within the borders of the Giresun Regional Forestry Directorate. Güce is located in the Colchic sector of the Euxine province of the Circumboreal phytogeographical region, and falls within the A7 square according to the grid system (Davis, 1965–1985). The annual mean temperature is 12.9 °C, and the annual mean precipitation is 878 mm. Moreover, the study area is under the influence of the oceanic climate below elevations of 1500 m, and semi-continental climate is felt at higher vegetation zones. Due to abundant rainfall and suitable temperature in all seasons, the lands of the district are rich in forest vegetation. The study area covers an area of about 184 km² (68.8 km² of this area is forested). Forest ecosystems belonging to the Giresun province, and also to Güce district, are of enormous importance and distributed within the Caucasus Biodiversity Hotspot. The Mediterranean climate makes itself felt at low elevations. It is possible to see species such as Arbutea unedo L., A. andrachne L., Laurus nobilis L., and Erica arborea L. in these areas. Forest vegetation consisting of deciduous species dominates at elevations up to 1000 m. Important species of this vegetation type include Tilia rubra DC. subsp. caucasica (Rupr.) V. Engl., Ulmus glabra Huds., Carpinus betulus L., Quercus petraea (Matt.) Liebl. subsp. iberica (Steven ex M. Bieb.) Krasslin., Castanea sativa Mill., Alnus glutinosa (L.) Gaertn. subsp. barbata (C.A. Mey.) Yalt., and Fagus orientalis Lipsky. At elevations of 1000–1750 (2000) m, coniferous forests consisting of Picea orientalis (L.) Peterm., Abies nordmanniana (Steven) Spach, and Pinus sylvestris L. var. hamata Steven (Fig. 2b) become dominant (Karaköse, 2019).

2.3. Data collection

Ethnobotanical knowledge was recorded by means of semi-structured interviews (Martin, 1995; Alexiades, 1996) with local people. Weckerle et al. (2018)'s recommendations were also considered within the scope of the study. Field studies were carried out in various vegetation periods between 2018 and 2021.
Interviews were conducted with local people in person; a total of 165 informants were surveyed with a two-part questionnaire (Appendix A). The first part of the questionnaire aimed to determine demographic characteristics such as gender, age, and education level. The second part aimed to obtain information about medicinal plant taxa, including vernacular names, parts used, preparation-utilization methods, and ailments treated. In the first year of the field studies, my student Mehmet Ali (from the Findıklı village) and I interviewed local people in the Findıklı village to become familiar with the region (Fig. 2i). Since Mehmet is from the Findıklı village, informants in this village were easy to find. In other villages, informants were reached through headmen (known as “muhtar” in Turkish) with the help of the Güce Forest Directorate. However, we noted that female participants were quite shy about sharing some information, especially on gynecological diseases. Fortunately, these problems were mitigated when Forest Engineer Gözde Çolak Karaköse (my wife) joined the interviews (Fig. 2c and d). Another problem was that older informants had difficulty remembering plant names during the interviews. In such cases, I used an illustrated brochure based on a floristic study carried out close to this study area (Karaköse, 2019). One final obstacle during this study was the Covid-19 pandemic. The Covid-19 pandemic, which manifested itself in Turkey in 2020, required additional precautions during village visits. As mentioned before, since Güce's
forests (12 villages are known as forest-dominated villages) belong to Tirebolu, coordination was made with the Tirebolu Forestry Management Directorate. In addition, Forest Engineer Mustafa Şen, the director of the directorate who is also from the İlît village of Güce, contributed to TK (Fig. 2f). During the study, each informant was informed that the research was for academic purposes, not for commercial purposes, and their consent was obtained. This ensured that informants did not treat the study with suspicion. In addition, this study complied with the International Society of Ethnobiology Code of Ethics (with 2008 additions) (http://www.ethnobiology.net/what-we-do/core-programs/ise-ethics-program/code-of-ethics/).

2.4. Plant materials and identification

Plant materials were collected from Fındıklı, Boncukçukur, Dayıcık, Düzçukur, Firını, Gürağaç, İlît, Sanyar, Ergenekon, Tekkeköy, Yüksekboynuyuğun, Soğukpınar, Örnekköy, and Tevekli villages and from Gümüşli-Kemaliye neighborhoods located in the center of Güce (Fig. 2g and h). The location of the plant specimens collected during the surveys, the characteristics of the habitat, elevations, and collection dates were recorded. Plants were identified using the “Flora of Turkey and the East Aegean Islands” (Davis, 1965–1985; Davis et al., 1988; Güner et al., 2000). Scientific names of plant taxa were checked using the Turkish Plant List (Güner et al., 2012) and updated according to World Flora Online (http://www.worldfloraonline.org). Threat categories of plant taxa were determined according to Ekim et al. (2000) and the International Union for Conservation of Nature (IUCN) (https://www.iucnredlist.org/). The voucher specimens were kept in Giresun University Herbarium. Upper taxonomic units of plant taxa were arranged according to Christenhusz et al. (2011a) and Pteridosperm Phylogeny Group I (PPG I, 2016) for Pteridophyta, Christenhusz et al. (2011b) for the Gymnospermae sub-division, and Angiosperm Phylogeny Group (APG) IV (Chase et al., 2016) for the Angiospermae sub-division.

2.5. Data analysis

The ethnobotanical data collected in this study was presented as primary data following the recommendations of Heinrich et al. (2009), Weckerle et al. (2018), and Leonti (2022). Data were analysed quantitatively using use report (UR), frequency of citation...
(FC), and the informant consensus factor (ICF). MS Excel was used for data entry and summary; quantitative indices were then calculated based on presence/absence data using the ethnobotanyR (Whitney, 2021) package (R package v.0.1.8). UR and FC are the most commonly used calculations for determining the accuracy of ethnobotanical data. UR gives information about a plant or a plant part used by one informant. FC is the number of informants who mentioned the use of a plant species. FC calculates the notional importance of each plant taxon without considering the ailment categories, while also showing their cultural significance (Tardio and Pardo-de-Santayana, 2008).

To calculate the homogeneity of knowledge gathered from interviewed local informants, the ICF formula developed by Trotter and Logan (1986) was used. The index was calculated by the following formula:

\[
\text{ICF} = \frac{(Nur - Nt)}{(Nur - 1)}
\]

where \(Nur\) is the number of UR for each ailment category, and \(Nt\) is the number of plant taxon used. ICF value ranges from 0 to 1, where “1” indicates the highest level of informant agreement. Low values (towards zero) demonstrate disagreement among informants about the usage of plant species for a specific ailment category (Heinrich et al., 1998). ICF values were created for 16 ailment categories arranged according to the International Classification of Primary Care (ICPC-2) (https://www.who.int/standards/classifications/other-classifications/international-classification-of-primary-care).

### 2.6. Statistics

The independent samples t-test (\(\alpha = 0.05\)) was computed to compare the differences in the number of medicinal plant species and their associated TK reported by male and female informants. The change in plant knowledge according to age and education level was also analysed with ANOVA and post hoc (Tukey) using SPSS software (v.22).

### 3. Results and discussion

#### 3.1. Demographic characteristics of the informants

Informants included the headmen of relevant villages, farmers, foresters, shepherds, villagers, housewives, and the other local people. The majority of informants were male (99; 60%), although 40% (66) were female. The age of the informants ranged from 21 to 97, with a mean age of 56.7. More detailed demographic information on the informants is given in Table 1.

| Gender | Number of informants | %  |
|--------|----------------------|----|
| Male   | 99                   | 60 |
| Female | 66                   | 40 |
| Age    |                       |    |
| 20–40  | 30                   | 18.2|
| 41–50  | 27                   | 16.3|
| 51–60  | 41                   | 24.8|
| >60    | 67                   | 40.6|
| Education |                  |    |
| Illiterate | 57                | 34.5|
| Primary  | 79                  | 47.9|
| Secondary | 21                 | 12.7|
| University | 8                  | 4.9|

#### 3.2. Plant taxonomy and associated knowledge

This ethnobotanical study identified 128 vascular medicinal plant taxa belonging to 54 families and 106 genera in Pteridophyta and Magnoliophyta (Pinidae and Magnoliidae subclasses) sections. The medicinal plants used in Güce district are listed in Table 2, which also contains information on plant vernacular names, parts used, preparation and utilization methods, therapeutic effects, URs, and FCs. Some medicinal plants are given in Fig. 3. The Pteridophyta section (Equisetidae and Polypodiidae sub-classes) is represented by four (3.1%) taxa within the Polypodiopsida class. The Gymnospermae (order of Pinales within the Pinidae sub-class) sub-section is represented by two families, four genera, and four woody taxa (3.1%). The Angiospermae (Mesangiospermae) sub-section is represented by 124 (96.9%) species and sub-species. Monocot angiosperms are represented by 12 (9.4%) plant taxa, whereas dicots are represented by 112 (87.3%) taxa.

The number of medicinal plant taxa collected in Güce district was higher than that found in previous studies (except for Kazanci et al., 2020) in other parts of the north-eastern Black Sea region (Fujita et al., 1995; Türkkan et al., 2006; Sagiroğlu et al., 2012; Saraç et al., 2013; Akbulut and Özkan, 2014; Polat et al., 2015; Eminagaoglu et al., 2017; Karakoço et al., 2019; Bak and Çifuçi, 2020; Gürdal and Öztürk, 2021). Only Kazanci et al. (2020), in their study of the plants of two neighboring countries, catalogued more plant taxa than this study. High medicinal plant diversity emerges as a result of local people living in touch with nature (Kbaburia et al., 2021).

Among the identified taxa, herbs are represented by 73 (57%) taxa, trees by 28 (21.9%) taxa, shrubs by 16 (12.5%) taxa, climbers by ten (7.8%) (including six woody), and one vascular semi-parasite (0.8%) plant. The distribution of plant taxa according to phytogeographical regions is as follows: Circumboreal 46 (35.9%) taxa, Mediterranean 5 (4%), and Irano–Turanian 2 (1.6%). Of the recorded medicinal plants, 28 (22%) taxa were cultivated. The remaining 47 taxa (36.7%) were cosmopolitan and pluri-regional. Circumboreal plant taxa predominate the research area, as the study area is within the Euxine province of the Circumboreal phytogeographical region (Karakoço, 2019). Families with the richest medicinal plant diversity were Rosaceae (16 taxa/12.5%), Asteraceae (12 taxa/9.4%), Lamiaceae (9 taxa/7%), followed by Apiaceae and Ericaceae (each 5 taxa/4%), Amaranthaceae (4 taxa/3.1%), Amaryllidaceae, Brassicaceae, Fagaceae, Malvaceae, Moraceae, Pinaceae, Polygonaceae, and Solanaceae (each 3 taxa/2.3%). An additional 53 medicinal plant taxa belong to the remaining 40 families (Fig. 4). The ranking of families to which medicinal taxa belong in the Güce district is nearly identical to the ranking of families in the Flora of Turkey (Davis, 1965–1985). Previous studies of the eastern Black Sea region reported similar results for the first two families (Fujita et al., 1995; Türkkan et al., 2006; Sagiroğlu et al., 2012; Karakoço et al., 2019; Bak and Çifuçi, 2020), but ranked differently (Saraç et al., 2013; Akbulut and Özkan, 2014; Polat et al., 2015; Eminagaoglu et al., 2017; Karci et al., 2017; Yeşiylurt et al., 2017; Gürbüz et al., 2019; Kazanci et al., 2020; Gürdal and Öztürk, 2021).

Of the 128 medicinal plants used for ethnobotanical purposes, only three plant taxa (Helleborus orientalis Lam., Veratrum album L., and Pteridium aquilinum (L.) Kuhn) are used for ethnoveterinary purposes.

According to the data obtained in the study, medicinal plants are mostly used as mono-plants in Güce. Only three formulations have bi-plant uses. Hypericum androsaemum L. leaf and young Hypericum androsaemum L. leaf and young A. glutinosus subsp. barbata leaves are combined and used as a hemostatic; A decoction of Trifolium pratense L. and Achillea millefolium L. is prepared in combination with flour of Zea mays L. to reduce swelling in sprains.
| No. | Family          | Botanical name and voucher number (new plant records in bold) | Local name       | Habitus/PC/ICUN | Part(s) used | Preparation | Utilization method | UR | FC | Therapeutic effect (Use Report: UR) |
|-----|----------------|---------------------------------------------------------------|------------------|-----------------|--------------|-------------|-------------------|----|----|-----------------------------------|
| 1   | Actinidiaceae   | Actinidia delicosa (A.Chev.) C.F.Liang & A.R.Ferguson MK-1496 | Kiwi             | C/Cul           | Fru          | Raw         | Raw               | 4  | 4  | Dyspepsia (UR: 3), cough (UR: 1)  |
| 2   | Adoxaceae       | Sambucus ebulus L. MK-1555                                    | Yividin, Yiğidin | H/PR/LC         | Flo, Fru, Lea | Cru, Raw, Ex, Hea, Dec | Com, Swa, Raw       | 19 | 15 | Anti-fungal (UR: 1), hemorrhoids (UR: 10), anti-allergy (UR: 3), constipation (UR: 1), intestinal worm (UR: 1), rheumatism (UR: 1), postpartum pain (UR: 1), dysmenorrhea (UR: 1) |
| 3   | Amaryllidaceae  | Sambucus nigra L. MK-1601                                    | Düdüklük         | T/PR            | Lea, Flo     | Inf         | Dot               | 3  | 1  | Dyspepsia (UR: 1), expectorant (UR: 1), galactagogue (UR: 1) |
| 4   | Amaranthaceae   | Amaranthus retroflexus L. MK-1592                             | Hoşuran           | H/PR            | Lea, Pet     | Coo         | Eat               | 16 | 13 | \( \text{Abscess (UR: 5), stomach disorder (UR: 4), constipation (UR: 2), stomach ache (UR: 1),} \) |
| 5   | Amaranthaceae   | Beta vulgaris L. MK-1505                                      | Pemük, Pemik     | H/Cul           | Lea          | Fre, Pic     | Com, Eat          | 11 | 10 | \( \text{headache (UR: 1), stomach disorder (UR: 1), carminative (UR: 1), anti-inflammatory (UR: 1), wounds (UR: 1)} \) |
| 6   | Amaranthaceae   | Chenopodium album L. MK-1607                                 | \( \text{İr üzümü} \) | H/PR            | Lea          | Cru         | Com               | 1  | 1  | Rheumatism (UR: 1) |
| 7   | Amaranthaceae   | Spinacia oleracea L. MK-1489                                | Ispanak          | H/Cul           | Lea          | Coo         | Eat               | 2  | 2  | Cardiovascular (UR: 1), dyspepsia (UR: 1) |
| 8   | Amaranthaceae   | Allium ampeloprasum L. MK-1499                               | Pirasa           | H/Cul           | Who          | Coo         | Eat               | 1  | 1  | Urinary tract infection (UR: 1) |
| 9   | Amaranthaceae   | Allium cepa L. MK-1502                                       | Soğan            | H/Cul           | Roo          | Raw, Dec, Boi, Jui, Hea | In, Dot, Com, Dot | 8  | 8  | Anti-inflammatory (UR: 2), epilepsy (UR: 1), lose weight (UR: 1), abscess (UR: 1), cholesterol (UR: 1), cough (UR: 1), wounds (UR: 1) |
| 10  | Amaranthaceae   | Allium sativum L. MK-1513                                    | Sarmsak          | H/Cul           | Roo          | Cru, Coo, Raw, Cru | Dan, Eat, Dbn, Dri | 16 | 14 | Abdominal pain (UR: 3), common cold (UR: 3), earache (UR: 2), hypertension (UR: 2), influenza (UR: 2), cough (UR: 1), immune system booster (UR: 1), antiseptic (UR: 1), bone fracture (UR: 1) |
| 11  | Apiaceae        | Aegopodium podagraria L. MK-1567                             | Baldran, Mendek, Mide otu | H/CB          | Lea, Pet     | Coo, Dec, Pic | Eat, Dot          | 18 | 15 | \( \text{Intestinal disorder (UR: 1), cardiovascular (UR: 1), analgesic (UR: 1), dyspepsia (UR: 7), stomach disorder (UR: 3), kidney disorder (UR: 1), carminative (UR: 1), stomach ache (UR: 1), gall bladder (UR: 1), dyspepsia (UR: 1)} \) |
| 12  | Apiaceae        | Heracleum platytaurum Boiss. MK-1602                         | Kekire, Ezeltere | H/CB           | Lea, Pet, Ste | Pic, Dec     | Eat, Dot          | 7  | 5  | \( \text{Liver steatosis (UR: 3), cholesterol (UR: 1), urinary tract infection (UR: 1), oedema (UR: 1), kidney stone (UR: 1), stomach disorder (UR: 1), gall bladder (UR: 1), diuretic (UR: 1), kidney disorder (UR: 1), eye diseases (UR: 1), anti-inflammatory (UR: 1), expectorant (UR: 1), dyspepsia (UR: 1)} \) |
| 13  | Apiaceae        | Oenanthe pimpinelloides L. MK-1610                           | Kazayağı         | H/PR            | Lea          | Coo         | Eat               | 1  | 1  | \( \text{Carminative (UR: 1)} \) |
| 14  | Apiaceae        | Petroselinum crispum (Mill.) A.W.Hill MK-1488                | Maydanoz         | H/Cul           | Lea, Pet     | Inf, Cru, Dec, Raw | Dtt, Dot, Eat     | 15 | 12 | \( \text{Liver steatosis (UR: 3), cholesterol (UR: 1), urinary tract infection (UR: 1), oedema (UR: 1), kidney stone (UR: 1), stomach disorder (UR: 1), gall bladder (UR: 1), diuretic (UR: 1), kidney disorder (UR: 1), eye diseases (UR: 1), anti-inflammatory (UR: 1), expectorant (UR: 1), dyspepsia (UR: 1), inappetence (UR: 1), stomach disorder (UR: 1)} \) |
| 15  | Apiaceae        | Pimpinella anisum L. MK-1485                                | Anason           | H/Cul           | Lea, See     | Cru, Dec     | Dbn, Dot          | 2  | 2  | \( \text{Herpes zoster (UR: 2), mumps (UR: 2), sore throat (UR: 1), hemorrhoids (UR: 1), headache (UR: 1), abdominal pain (UR: 1), Burn (UR: 3)} \) |
| 16  | Araceae         | Arum maculatum L. MK-1580                                   | Ayi kulakî       | H/PR            | Roo, Lea, Fru | Dec, Fre, Ms | Dot, Com          | 8  | 5  | \( \text{Liver steatosis (UR: 3), cholesterol (UR: 1), urinary tract infection (UR: 1), oedema (UR: 1), kidney stone (UR: 1), stomach disorder (UR: 1), gall bladder (UR: 1), diuretic (UR: 1), kidney disorder (UR: 1), eye diseases (UR: 1), anti-inflammatory (UR: 1), expectorant (UR: 1), dyspepsia (UR: 1), inappetence (UR: 1), stomach disorder (UR: 1)} \) |
| 17  | Araliaceae      | Hedera colchica (K. Koch) K. Koch MK-1552                    | Orman sarmasıği  | C/CB            | Lea          | Fre, Raw     | Com, Che          | 3  | 3  | \( \text{Burn (UR: 3)} \) |
| No. | Family         | Botanical name and voucher number (new plant records in bold)                                                                 | Local name                        | Habitus/PG(IUCN) | Part(s) used* | Preparation† | Utilization method‡ | UR  | FC | Therapeutic effect (Use Report: UR) (new uses are indicated in bold) |
|-----|----------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------|---------------|---------------|----------------------|-----|----|---------------------------------------------------------------------|
| 18  | Araliaceae     | *Hedera helix* L. MK-1595                                                                                                 | Duvar sarması                     | C/PR/LC           | Lea           | Dec           | Com, Dot             | 7   | 5  | Hypertension (UR: 1), dysmenorrhea (UR: 1), bronchitis (UR: 1),   |
|     |                |                                                                                                                          |                                    |                   |               |               |                      |     |    | constipation (UR: 1), hemorrhoids (UR: 1), toothache (UR: 1)     |
| 19  | Asparagaceae   | *Ornithogalum sigmoideum* Freyn & Sint. MK-1565                                                                         | Sakarca, Akyildiz                  | H/CB              | Who, Flo, Roo, Lea | Cru, Coo      | Com, Eat             | 12  | 7  | Acne (UR: 3), abscess (UR: 2), common cold (UR: 1), influenza   |
|     |                |                                                                                                                          |                                    |                   |               |               |                      |     |    | (UR: 1), rheumatism (UR: 1), constipation (UR: 1), dyspepsia    |
|     |                |                                                                                                                          |                                    |                   |               |               |                      |     |    | (UR: 1), carminative (UR: 1), stomach disorder (UR: 1)         |
| 20  | Asparagaceae   | *Ruscus colchicus* Yeo MK-1600                                                                                             | Sigile                           | H/CB              | Cla, Roo      | Dec           | Dts                  | 5   | 3  | Cough (UR: 1), nausea (UR: 1), wounds (UR: 1)                    |
| 21  | Aspleniaceae   | *Asplenium scolopendrium* L. MK-1599                                                                                       | Yaraotu, Civranperçemi            | H/PR/LC           | Lea, Flo, Cru, Dec | Com, Dot, Dts |                      | 3   | 1  | Wounds (UR: 3), urinary tract infection (UR: 1), hypertension (UR:|
|     |                |                                                                                                                          |                                    |                   |               |               |                      |     |    | 1), cardiovascular (UR: 1), common cold (UR: 1), cancer (UR: 1) |
| 22  | Asteraceae     | *Achillea millefolium* L. MK-1578                                                                                         | Mayis papatyasi                   | H/CB              | Flo           | Dec, Inf     | Dot, Dam             | 21  | 7  | Common cold (UR: 7), influenza (UR: 5), cough (UR: 2), carminative|
|     |                |                                                                                                                          |                                    |                   |               |               |                      |     |    | (UR: 1), cardiovascular (UR: 1), liver steatosis (UR: 1), headache|
|     |                |                                                                                                                          |                                    |                   |               |               |                      |     |    | (UR: 1), bronchitis (UR: 1), dyspepsia (UR: 1), expectorant (UR:|
| 24  | Asteraceae     | *Helianthus tuberosus* L. MK-1568                                                                                          | Yer elması                        | H/Cul             | Roo           | Raw           | Raw                  | 1   | 1  | Intestinal worm (UR: 1)                                         |
| 25  | Asteraceae     | *Helichrysum arenarium* (L.) Moench subsp. aicheri (Boiss.) P.J.H.Davis & Kupicha MK-1549                               | Dudiye, Alnottu, Cennet çiçeği, Dudiye | H/IT/LC           | Flo, Ste      | Dec, Inf     | Dot, Dbm, Sme       | 26  | 20 | Common cold (UR: 3), urinary tract infection (UR: 3), dyspepsia (UR:|
|     |                |                                                                                                                          |                                    |                   |               |               |                      |     |    | 2), immune system booster (UR: 2), stomach disorder (UR: 2),   |
|     |                |                                                                                                                          |                                    |                   |               |               |                      |     |    | anti-fungal (UR: 1), anti-inflammatory (UR: 1), abdominal pain   |
|     |                |                                                                                                                          |                                    |                   |               |               |                      |     |    | (UR: 1), menopause (UR: 1), oedema (UR: 1), loss weight (UR: 1), |
|     |                |                                                                                                                          |                                    |                   |               |               |                      |     |    | cough (UR: 1), cholesterol (UR: 1), wounds (UR: 1), dysmenorrhea|
|     |                |                                                                                                                          |                                    |                   |               |               |                      |     |    | (UR: 1), jaundice (UR: 1), kidney stone (UR: 1), lung disease    |
|     |                |                                                                                                                          |                                    |                   |               |               |                      |     |    | (UR: 1), influenza (UR: 1), fever (UR: 1), Dyspepsia (UR: 1)     |
| 26  | Asteraceae     | *Lactuca sativa* L. MK-1586                                                                                               | Eşek dikeni                       | H/IT/DD           | Flo, Lea      | Dec, Inf     | Dot                  | 3   | 2  | Blood purifier (UR: 1), dyspepsia (UR: 1), intestinal disorder    |
| 27  | Asteraceae     | *Carduus onopordoides* Fisch. ex M.Bieb. subsp. tussicus (Kazm.) P.J.H.Davis MK-1570                                        | Galalak, Gebelek                  | H/CB/LC           | Lea, Pet, Ste | Pic, Coo     | Eat                  | 20  | 15 | Dyspepsia (UR: 10), stomach disorder (UR: 6), stomach ache (UR:|
|     |                |                                                                                                                          |                                    |                   |               |               |                      |     |    | 2), abdominal pain (UR: 1), carminative (UR: 1)                  |
| 28  | Asteraceae     | *Prenanthes petiolarata* (K.Koch) Sennikov MK-1516                                                                        | Sütlegen                          | H/CB              | Aer           | Cru           | Com                  | 1   | 1  | Wounds (UR: 1)                                                   |
| 29  | Asteraceae     | *Tanacetum parthenium* (L.) Sch.Bip. MK-1583                                                                             | Papatyra                          | H/PR/LC           | Flo, Lea      | Dec           | Dtt, Dot             | 3   | 3  | Common cold (UR: 2), bronchitis (UR: 1)                           |
| 30  | Asteraceae     | *Tarraxacum laxum* G.E.Hagl. MK-1537                                                                                       | Karahindiba                       | H/PR              | Aer, Roo, Lea | Cru, Dec      | Com, Dot             | 5   | 4  | Abscess (UR: 1), eczema (UR: 1), lose weight (UR: 1), rheumatism  |
| 31  | Asteraceae     | *Tripleurospermum elongatum* (DC.) Bornm. MK-1517                                                                        | Papatyra                          | H/PR              | Flo, Dec      | Inf           | Dot, Vap, Was        | 24  | 20 | Common cold (UR: 8), cough (UR: 4), bronchitis (UR: 2), dyspepsia|
|     |                |                                                                                                                          |                                    |                   |               |               |                      |     |    | (UR: 2), influenza (UR: 2), sinusitis (UR: 1), cancer (UR: 1),   |
| 32  | Asteraceae     | *Tussilago farfara* L. MK-1561                                                                                             | Oksürük otu                       | H/CB/LC           | Lea, Flo      | Dec           | Dot                  | 6   | 5  | Cough (UR: 2), influenza (UR: 2), common cold (UR: 1), tonic (UR:|

(continued on next page)
| No. | Family       | Botanical name and voucher number (new plant records in bold) | Local name   | Habitus/PG/IUCN | Part(s) used | Preparation | Utilization method | UR | FC | Therapeutic effect (Use Report: UR) (new uses are indicated in bold) |
|-----|--------------|---------------------------------------------------------------|--------------|-----------------|--------------|-------------|-------------------|----|----|--------------------------------------------------------------------|
| 34  | Athyriaceae  | Athyrium filix-femina (L.) Roth MK-1538                       | Eğreli otu, Cibarca | H/PR | Roo | Dec | Dot | 3  | 3 | Scabby (UR: 1), varicose (UR: 1), intestinal worm (UR: 1), |
| 35  | Betulaceae   | Alnus glutinosa (L.) Gaertn. subsp. barbata (C.A.Mey.) Yalt. MK-1508 | Yaykun, Kızılcağ | T/CB/DD | Lea, Bar, Sho | Cru, Dec, Fre, Hea | Com, Dot | 19 | 15 | Wounds (UR: 6), headache (UR: 5), burn (UR: 2), eczema (UR: 2), hemostatic (UR: 2), intestinal worm (UR: 1), anti-fungal (UR: 1), Cholesterol (UR: 6), cardiovascular (UR: 5), tonic (UR: 2), hypertension (UR: 1) |
| 36  | Betulaceae   | Corylus avellana L. MK-1511                                   | Findik       | S/CR/LC | See | Raw | Raw | 14 | 12 | Dyspepsia (UR: 5), stomach disorder (UR: 2), abscess (UR: 2), antipyretic (UR: 2), tonsilitis (UR: 1), expectorant (UR: 1), insomnia (UR: 1), anti-inflammatory (UR: 1), diuretic (UR: 1), constipation (UR: 1), carminative (UR: 1), dysmenorrhea (UR: 1) |
| 37  | Boraginaceae | Trachystemon orientalis (L.) D. Don MK-1518                    | Galdırık, Kaldırık | H/CB | Lea, Ste, Pet, Roo, Flo | Dec, Coo, Fre, Cru | Dot, Eat, Com, Dot | 19 | 15 | Dyspepsia (UR: 8), dysmenorrhea (UR: 2), stomach ache (UR: 2), cancer (UR: 1), iron deficiency (UR: 1), analgesic (UR: 1), ulcer (UR: 1), tonic (UR: 1), influenza (UR: 1), galactagogue (UR: 1), intestinal disorders (UR: 1), constipation (UR: 1) |
| 38  | Brassicaceae | Brassica oleracea L. MK-1498                                   | Karahalana, Pancar | H/Cul/LC | Lea, Flo | Coo, Fre, Raw, Dec | Eat, Com, Dot | 21 | 16 | Intestinal worm (UR: 1), joint pain (UR: 1) |
| 39  | Brassicaceae | Nasturtium officinale R. Br. MK-1569                           | Gerderme     | H/PR/LC | Lea | Dec, Cru | Dot, Com | 2  | 2 | Cough (UR: 1) |
| 40  | Brassicaceae | Raphanus raphanistrum L. subsp. sativus (L.) Domin MK-1590     | Turp         | H/Cul | Roo | Dec | Eat | 1  | 1 | Antipyretic (UR: 2), burn (UR: 1), diaphoretic (UR: 1), diuretic (UR: 1), hypertension (UR: 1) |
| 41  | Buxaceae     | Buxus sempervirens L. MK-1559                                  | Şımpşir      | S/CR/LC | Lea, Nec | Dec, Hon | Com, Dot, Eat | 6  | 4 | Rheumatism (UR: 4), joint pain (UR: 1), anti-inflammatory (UR: 1), analgesic (UR: 1) |
| 42  | Convolvulaceae | Cuscuta silvatica (Kil.) Crisèb. MK-1530                       | Yilan bürgü | C/PR | Roo, Lea | Cru, Fre | Ex, Com | 7  | 5 | Rheumatism (UR: 4), joint pain (UR: 1), anti-inflammatory (UR: 1), analgesic (UR: 1) |
| 43  | Cornaceae    | Cornus mas L. MK-1548                                         | Kızlık       | S/CR/LC | Fru, Lea | Raw, Jam, Dec, Cru, Mar | Raw, Eat, Dtt, Com, Dot | 9  | 9 | Diarrheal (UR: 1), dyspepsia (UR: 1), anemia (UR: 1), wounds (UR: 1), urinary tract infection (UR: 1), stomach ache (UR: 1), herpes zoster (UR: 1), diabetes (UR: 1), carminative (UR: 1) |
| 44  | Cucurbitaceae | Citrullus lanatus (Thunb.) Matsum. & Nakai MK-1492              | Karpuz       | C/Cul | Fru | Raw | Raw | 1  | 1 | Dyspepsia (UR: 1) |
| 45  | Cucurbitaceae | Cucurbita moschata Duchesn MK-1492                             | Kabak        | C/Cul | Fru | Coo | Eat | 2  | 2 | Stomach disorders (UR: 1), dyspepsia (UR: 1) |
| 46  | Dennstaedtiaceae | Potentilla aquilinum (L.) Kuhn MK-1554                     | Güllük       | H/PR | Who | Bur | Fum | 5  | 5 | Scabby (UR: 5) |
| 47  | Dioscoreaceae | Dioscorea communis (L.) Caddick & Wilkin MK-1524            | Acmuk, Yılanlık | C/PR/LC | Roo, Lea, Fru | Cru, Hea, Fre | Com | 6  | 5 | Rheumatism (UR: 3), osteoarthritis (UR: 1), eczema (UR: 1), anti-fungal (UR: 1) |
| 48  | Ebenaceae    | Diospyros lotus L. MK-1606                                     | Trabzon hurnasi | T/PR/LC | Fru | Raw | Eat | 2  | 1 | Stomach ache (UR: 1), dyspepsia (UR: 1) |
| 49  | Equisetaceae | Equisetum telmateia Ehrh. MK-1577                             | H/PR | Aer, Lea, Ste | Dec, Inf, Fre | Dot, Com | 8  | 6 | Wounds (UR: 2), herniated disc (UR: 1), stomach disorder (UR: 1), menstrual irregularity (UR: 1), oedema (UR: 1), kidney stone (UR: 1), dyspepsia (UR: 1) |
| 50  | Ericaceae    | Arbutus unedo L. MK-1611                                     | Ağacı çiğle | T/Med/LC | Fru | Raw, Jam | Eat | 1  | 1 | Anemia (UR: 1) |
| 51  | Ericaceae    | Rhododendron luteum Sweet MK-1544                             | Sari Avu     | S/CR/LC | Flo, Nec | Dec, Cru, Hon | Dot, Ex, Eat | 3  | 3 | Carminative (UR: 1), intertrigo (UR: 1), hypertension (UR: 1) |
| 52  | Ericaceae    | Rhododendron ponticum L. MK-1543                              | Mor Avu      | S/CR | Flo, Lea | Dec, Inf, Hea | Dot, Com | 4  | 3 | Abdominal pain (UR: 1), eczema (UR: 1), kidney disorder (UR: 1), rheumatism (UR: 1) |
| No. | Family       | Botanical name and voucher number (new plant records in bold) | Local name | Habitus/PG/IUCN | Part(s) used | Preparation | Utilization method | UR | FC | Therapeutic effect (Use Report: UR) (new uses are indicated in bold) |
|-----|--------------|---------------------------------------------------------------|------------|------------------|--------------|-------------|---------------------|----|----|---------------------------------------------------------------------|
| 53  | Ericaceae    | Vaccinium arctostaphylos L. MK-1557                           | Çileklik    | S/BD/DD          | Lea, Fru, Sho | Raw, Dec    | Raw, Dtt, Dot   | 10 | 7  | Diabetes (UR: 4), cancer (UR: 2), neurotic (UR: 1), intestinal disorder (UR: 1), eye diseases (UR: 1), hair loss (UR: 1) |
| 54  | Ericaceae    | Vaccinium myrtillus L. MK-1575                               | Çalışiğe, Dal çıkar                  | S/BL/LC | Fru, Lea, Sho | Raw, Dec, Coo, Inf, Cru, Jam | Raw, Dtt, Dot, Eat | 26 | 19 | Diabetes (UR: 6), anemia (UR: 4), dyspepsia (UR: 3), abdominal pain (UR: 2), diarrheal (UR: 2), immune system booster (UR: 2), stomach disorder (UR: 2), cholesterol (UR: 1), hypertension (UR: 1), anti-inflammatory (UR: 1), cardiovascular (UR: 1), cancer (UR: 1) |
| 55  | Fabaceae     | Trifolium pratense L. MK-1605                                | Krmızı yonca, Uçgül beyaz yonca     | H/PR | Flo | Dec | Dot | 5 | 4 | Influenza (UR: 3), common cold (UR: 1), asthma (UR: 1) |
| 56  | Fabaceae     | Trifolium repens L. MK-1608                                  | Zide, Zevir                           | S/CB | Fru, Nec | Jam, Hon | Eat | 5 | 4 | Common cold (UR: 2), influenza (UR: 1), cough (UR: 1), nausea (UR: 1) |
| 57  | Fagaceae     | Quercus petrea (Matt.) Liebl. subsp. iberica (Steven ex M.Bieb.) KRASSIL. MK-1556 | Pelit | T/PR | Bar, Fru | Dec | Dot, Com | 9 | 7 | Stomach disorders (UR: 3), wounds (UR: 2), cancer (UR: 1), eczema (UR: 1), liver steatosis (UR: 1), diarrheal (UR: 1) |
| 58  | Fagaceae     | Castanea sativa Mill. MK-1576                                | Kestane                              | T/BL/LC | See, Flo, Lea, Nec | Raw, Oil, Dec, Hon | Raw, Dtt, Dot, Eat | 13 | 7 | Aphrodisiac (UR: 2), constipation (UR: 2), hypertension (UR: 2), diarrheal (UR: 1), rheumatism (UR: 1), analgesic (UR: 1), asthma (UR: 1), tonic (UR: 1), cough (UR: 1), expectorant (UR: 1), stomach disorder (UR: 1) |
| 59  | Fagaceae     | Fagus orientalis Lipsky MK-1588                             | Kayın                                  | T/BL/LC | Lea | Dec | Dot | 1 | 1 | Diabetes (UR: 2), antiglomerular (UR: 1), kidney stone (UR: 1), dyspepsia (UR: 1) |
| 60  | Grossulariaceae | Ribes petraeum Wulffen MK-1560                          | Zide, Zevir                           | S/CB | Fru, Nec | Jam, Hon | Eat | 5 | 4 | Diabetes (UR: 2), antiglomerular (UR: 1), kidney stone (UR: 1), dyspepsia (UR: 1) |
| 61  | Hypericaceae | Hypericum androsaenum L. MK-1529                            | Karamaz                                | H/PR | Lea | Cru | Com | 1 | 1 | Hemostatic (UR: 1) |
| 62  | Hypericaceae | Hypericum perforatum L. MK-1510                             | Kantaron                               | H/BL/LC | Lea, Flo, Pet | Cru, Dec, Oil | Com, Dot, Dri | 17 | 11 | Sedative (UR: 3), wounds (UR: 3), analgesic (UR: 2), diuretic (UR: 1), vasoconstrictor (UR: 1), dysmenorrhea (UR: 1), herpes zoster (UR: 1), earache (UR: 1), bronchitis (UR: 1), migraine (UR: 1), Cholesterol (UR: 6), cardiovascular (UR: 2), rheumatism (UR: 2), liver steatosis (UR: 1), toothache (UR: 1), hemostatic (UR: 1), hypertension (UR: 1) |
| 63  | Juglandaceae | Juglans regia L. MK-1487                                     | Ceviz                                  | T/BL/LC | See, Lea | Raw, Inf, Dec, Fre | Raw, Doo, Mou, Was, Com | 14 | 12 | Cholesterol (UR: 4), anemia (UR: 5), sore throat (UR: 1), dyspepsia (UR: 1), nausea (UR: 1), abdominal pain (UR: 2), diarrheal (UR: 2), immune system booster (UR: 2), stomach disorder (UR: 2), cholesterol (UR: 1), hypertension (UR: 1), ant-inflammatory (UR: 1), cardiovascular (UR: 1), infection (UR: 1), cancer (UR: 1), urinary tract infection (UR: 1), bronchitis (UR: 1), eye diseases (UR: 1), hair loss (UR: 1), cardiovascular (UR: 1), cancer (UR: 1), urinary tract infection (UR: 1), abdominal pain (UR: 2), diarrheal (UR: 2), immune system booster (UR: 2), stomach disorder (UR: 2), cholesterol (UR: 1), hypertension (UR: 1), anti-inflammatory (UR: 1), cardiovascular (UR: 1), cancer (UR: 1) |
| 64  | Juncaceae    | Luzula sylvatica (Huds.) Gaudin MK-1525                       | Gindra                                 | H/CB | Lea | Dec | Dot | 2 | 1 | Diuretic (UR: 1), expectorant (UR: 1) |
| 65  | Juncaceae    | Juncus alpinus K.Koch MK-1541                                | Çöpotu, Çiloru                         | H/CB | Lat, Roo, Ste | Cru, Dec | Com, Dot | 5 | 5 | Headache (UR: 2), wounds (UR: 2), intertrigo (UR: 1) |
| 66  | Lamiaceae    | Lamiun purpureum L. MK-1539                                  | Ballicak                                | H/CB | Flo, Lea | Cru, Dec | Com, Dot | 2 | 2 | Abscess (UR: 1), carminative (UR: 1) |
| 67  | Lamiaceae    | Mentha longifolia (L.) L. subsp. typhoides (Briq.) Harley MK-1571 | Yarpuz                                 | H/PR | Lea, Flo | Coo, Spi, Inf | Eat, Doe | 3 | 2 | Common cold (UR: 1), influenza (UR: 1), nausea (UR: 1) |
| 68  | Lamiaceae    | Mentho pulegium L. MK-1524                                   | Anuk, Haman                             | H/PR/LC | Lea, Flo | Dec, Inf | Dtt, Dto, Doh | 18 | 13 | Common cold (UR: 5), influenza (UR: 5), sore throat (UR: 1), dyspepsia (UR: 1), nausea (UR: 1), diarrheal (UR: 1), tonsillitis (UR: 1), cough (UR: 1), dyspepsia (UR: 1), asthma (UR: 1), Common cold (UR: 2), influenza (UR: 2), immune system booster (UR: 2), diarrheal (UR: 1) |
| 69  | Lamiaceae    | Mentha spicata L. MK-1491                                    | Bahçe nanesi                          | H/Cul | Lea | Dec, Inf, Spi | Dtt | 11 | 10 | Common cold (UR: 4), influenza (UR: 3), nausea (UR: 2), immune system booster (UR: 2), diarrheal (UR: 1) |

(continued on next page)
| No. | Family | Botanical name and voucher number (new plant records in bold) | Local name | Habitus/PG/UCN | Part(s) used | Preparation | Utilization method | UR | FC | Therapeutic effect (Use Report: UR) (new uses are indicated in bold) |
|-----|--------|---------------------------------------------------------------|------------|----------------|--------------|-------------|-------------------|----|----|---------------------------------------------------------------|
| 70  | Lamiaceae | *Salvia forskahliei* L. MK-1604 | Ağbandik | H/CB | Lea | Fre | Com | 1 | 1 | Wounds (UR: 1) |
| 71  | Lamiaceae | *Salvia tomentosa* Mill. MK-1506 | Adaçayı | H/Med/LC | Flo, Lea, Sho | Dec | Dtt | 5 | 4 | Influenza (UR: 2), neurotic (UR: 2), common cold (UR: 1) Cancer (UR: 1) |
| 72  | Lamiaceae | *Stachys sylvestria* L. MK-1609 | Ham sorgan | H/CB | Lea | Coo | Eat | 1 | 1 | |
| 73  | Lamiaceae | *Thymus nummularius* M.Bieb. MK-1520 | Kekik | H/CB | Lea, Flo, Sho, Aer | Dec, Spi, Inf | Dtt, Dot | 26 | 19 | Influenza (UR: 10), common cold (UR: 8), bronchitis (UR: 2), immune system booster (UR: 2), cholesterol (UR: 2), stomach disorder (UR: 1), insomnia (UR: 1) Influenza (UR: 17), common cold (UR: 10), cough (UR: 4), dyspepsia (UR: 2), asthma (UR: 1), insomnia (UR: 1), toothache (UR: 1), nausea (UR: 1), bronchitis (UR: 1), stomach disorder (UR: 1), tonic (UR: 1) |
| 74  | Lamiaceae | *Thymus praecox* Opiz subsp. grossheimii (Ronniger) Jalas MK-1533 | Yayla kekiği | H/CB | Aer, Flo, Lea | Dec, Inf, Raw, Spi | Dtt, Che, Eat | 40 | 27 | Cough (UR: 5), stomach disorder (UR: 4), cancer (UR: 2), constipation (UR: 2), dyspepsia (UR: 2), stomach ache (UR: 1), sore throat (UR: 1), oedema (UR: 1), cholesterol (UR: 1), anemia (UR: 1), diuretic (UR: 1) |
| 75  | Lauraceae | *Laurus nobilis* L. MK-1574 | Define | T/Med/LC | Lea | Dec | Dot | 1 | 1 | |
| 76  | Liliaceae | *Lilium ciliatum* P.H.Davis MK-1612 | Sümül | H/CB/EN | Flo | Fre | Sme | 2 | 1 | Headache (UR: 1), nasal passages (UR: 1) |
| 77  | Malvaceae | *Alceus rosea* L. MK-1551 | Hatmi | S/PR | Flo | Inf | Dot | 2 | 2 | Cough (UR: 2) |
| 78  | Malvaceae | *Malva sylvestris* L. MK-1512 | Ebegömeci | H/CB | Lea, Flo | Coo, Dec, Inf, Pom | Eat, Dot, Com | 27 | 20 | Cough (UR: 5), stomach disorder (UR: 4), cancer (UR: 2), constipation (UR: 2), dyspepsia (UR: 2), stomach ache (UR: 1), sore throat (UR: 1), oedema (UR: 1), cholesterol (UR: 1), anemia (UR: 1), diuretic (UR: 1) |
| 79  | Malvaceae | *Tilia rubra* DC. subsp. caucasica (Rupr.) V.Engl. MK-1493 | İhihamur | T/CB | Flo, Bra, Lea, Nec | Dec, Inf, Hon | Dbb, Dtt, Dce, Dot, Eat | 92 | 61 | |
| 80  | Melastomataceae | *Veratrum album* L. MK-1582 | Akunduz | H/CB | Lea | Dec | Was | 1 | 1 | Wart (UR: 5), dyspepsia (UR: 1), scorpion sting (UR: 1), callus (UR: 1), hemorrhoids (UR: 1), intestinal disorders (UR: 1) |
| 81  | Moraceae | *Ficus carica* L. MK-1494 | Incir | T/Med | Fru, Lat | Raw, Cru | Raw, Ex | 10 | 9 | |
| 82  | Moraceae | *Morus alba* L. MK-1400 | Akedut | T/Cul | Lea, Fru | Dec, Raw, Mol | Dtt, Raw, Eat | 4 | 4 | Diabetes (UR: 2), anemia (UR: 1), iron deficiency (UR: 1) |
| 83  | Moraceae | *Morus nigra* L. MK-1547 | Karadut | T/Cul | Fru | Raw, Dec, Jam | Raw, Dot | 13 | 12 | Anemia (UR: 7), diabetes (UR: 3), aphthae (UR: 1), blood purifier (UR: 1), stomach ache (UR: 1) |
| 84  | Oleaceae | *Olea europaea* L. MK-1603 | Zeytin | T/Med | Lea | Dec | Dot | 1 | 1 | |
| 85  | Oxalidaceae | *Osulisc acetoella* L. MK-1514 | Ekşi yonca | H/PR | Aër, Lea | Coo, Dec | Eat, Dot | 3 | 2 | Inappetence (UR: 1), abdominal pain (UR: 1), kidney disorder (UR: 1) |
| 86  | Papaveraceae | *Chelidonium majus* L. MK-1564 | Temrü otu | H/CB/LC | Lea | Cru | Ex, Com | 4 | 4 | Atopic dermatitis (UR: 2), anti-fungal (UR: 1), abscess (UR: 1) |
| 87  | Pinaceae | *Abies nordmanniana* (Steven) Spach MK-1597 | Kökör | T/CB/LC | Res | Hea | Com | 1 | 1 | Anti-inflammatory (UR: 1) |
| 88  | Pinaceae | *Picea orientalis* (L.) Peterm. MK-1536 | Ladin | T/CB/LC | Res, Kin, Sho, Con | Hea, Raw, Dec, Jam | Com, Che, Dtt, Dot, Eat | 23 | 12 | Dyspnea (UR: 4), wounds (UR: 4), anti-inflammatory (UR: 2), common cold (UR: 2), diabetes (UR: 2), influenza (UR: 2), stomach disorder (UR: 2), cough (UR: 1), sore throat (UR: 1), backache (UR: 1), hypotension (UR: 1), ulcer (UR: 1) |
| 89  | Pinaceae | *Pinus sylvestris* L. var. hamata Steven MK-1535 | Alaçam, Çam | T/CB/LC | Sho, Bar, Res, Con, Mal | Mol, Hea, Dec, Fr, Jam | Eat, Com, Dtt, Dot | 60 | 35 | Bronchitis (UR: 8), dyspnea (UR: 7), wounds (UR: 6), cough (UR: 5), cancer (UR: 4), diabetes (UR: 4), anti-inflammatory (UR: 3), common cold (UR: 3), influenza |
Table 2 (continued)

| No. | Family | Botanical name and voucher number (new plant records in bold) | Local name | Habitus/PG/UCN | Part(s) used | Preparation | Utilization method | UR | FC | Therapeutic effect (Use Report: UR) |
|-----|--------|---------------------------------------------------------------|------------|----------------|-------------|-------------|-------------------|----|----|------------------------------------|
| 90  | Plantaginaceae | *Plantago lanceolata* L. MK-1504 | Sivrisilik, Yaraotu, Parmakotu, Dermisilik | H/PR/LC | Lea | Fre, Dec, Cru | Com, Dot | 40 | 31 | (UR: 3), asthma (UR: 2), bone fracture (UR: 2), lung disease (UR: 2), sore throat (UR: 2), antiseptic (UR: 1), backache (UR: 1), dysmenorrhea (UR: 1), expectorant (UR: 1), neurotic (UR: 1), stomach disorder (UR: 1), stomach ache (UR: 1), tetanus (UR: 1), ulcer (UR: 1) |
| 91  | Plantaginaceae | *Plantago major* L. MK-1501 | Babadeşen, Damarotu, Sınırlı ot | H/PR | Lea | Fre, Inf, Raw, Dec | Com, Dot, Eat | 23 | 19 | Abscess (UR: 17), wounds (UR: 8), anti-inflammatory (UR: 3), acne (UR: 1), aphtha (UR: 1), cancer (UR: 1), rheumatism (UR: 1), analgesic (UR: 1), stomach ache (UR: 1), antiseptic (UR: 1), diabetes (UR: 1), cardiovascular (UR: 1), kidney stone (UR: 1), oedema (UR: 1), urinary tract infection (UR: 1) |
| 92  | Plantanaceae | *Platanus orientalis* L. MK-1568 | Çınar | T/PR/DD | Lea | Dec | Dot | 15 | 11 | Abscess (UR: 10), wounds (UR: 8), stomach disorder (UR: 1), expectorant (UR: 1), cough (UR: 1), tonic (UR: 1), neurotic (UR: 1) |
| 93  | Poaceae | *Zea mays* L. MK-1519 | Msır | H/Cal | See, Sty, Hus | Cru, Ms, Dec | Eat, Com, Dam, Dot | 20 | 19 | Bone fracture (UR: 7), lose weight (UR: 3), urinary tract infection (UR: 3), intestinal disorder (UR: 2), dyspepsia (UR: 1), kidney disorder (UR: 1), kidney stone (UR: 1), rheumatism (UR: 1), anti-fungal (UR: 1) |
| 94  | Polygonaceae | *Polygonum carneum* C. Koch MK-1594 | Gücükdeve | H/CB | Lea, Flo, Roo | Coo, Dec | Eat, Dot, Com | 10 | 9 | Carminative (UR: 1), stomach disorder (UR: 1), dyspepsia (UR: 1), hemorrhoids (UR: 1) |
| 95  | Polygonaceae | *Rumex acetosella* L. MK-1546 | Kuzukulağı, Ekşi pancar | H/PR/LC | Lea | Fre, Coo, Cru, Dec | Com, Eat, Dot | 8 | 7 | Analgesic (UR: 1), antipyretic (UR: 1), cancer (UR: 1), common cold (UR: 1), Diuretic (UR: 1), inappetence (UR: 1), influenza (UR: 1), kidney disorder (UR: 1) |
| 96  | Polygonaceae | *Rumex obtusifolius* L. MK-1585 | Labada, Evelik | H/PR | Lea | Fre, Coo, Dec | Com, Eat, Dot | 10 | 7 | Dyspepsia (UR: 3), inappetence (UR: 2), constipation (UR: 2), dysmenorrhea (UR: 1), stomach disorder (UR: 1), abscess (UR: 1) |
| 97  | Primulaceae | *Cyclamen coum* Mill. subsp. caucasicum (K. Koch) O. Schwarz MK-1521 | Domuzağaç | H/PR/LC | Roo | Dec, Fre | In, Com, Mou, Dot, Sme | 10 | 10 | Sinusitis (UR: 4), analgesic (UR: 1), headache (UR: 1), tonsillitis (UR: 1), diabetes (UR: 1), jaundice (UR: 1), unwanted pregnancy (UR: 1) |
| 98  | Primulaceae | *Primula vulgaris* Huds. MK-1528 | Yabani marul | H/CB | Flo | Cru | Com | 1 | 1 | Wounds (UR: 1) |
| 99  | Ranunculaceae | *Helleborus orientalis* Lam. MK-1542 | Çöpleme, Danakiran | H/CB | Lea, Roo | Fre, Dec | Com, Was | 3 | 3 | Scabby (UR: 2), wounds (UR: 1) |
| 100 | Ranunculaceae | *Ranunculus repens* L. MK-1579 | San çıkıtk | H/PR | Roo | Cru, Dec | Com | 3 | 2 | Wounds (UR: 2), hemorrhoids (UR: 1) |
| 101 | Rosaceae | *Alchemilla caucasica* Buser MK-1550 | Dokuztepe, Aslan pençesi | H/CB | Flo, Lea, Who | Dec, Inf, Fre | Dot, Dtt, Com | 25 | 19 | Dysmenorrhea (UR: 3), kidney disorder (UR: 3), antipyretic (UR: 2), menstrual irregularity (UR: 2), influenza (UR: 1), common cold (UR: 1), galactagogue (UR: 1), hemorrhoids (UR: 1), cardiovascular (UR: 1), expectorant (UR: 1), neurotic (UR: 1), sedative (UR: 1), cough (UR: 1), stomach disorder (UR: 1), insomnia (UR: 1), hypertension (UR: 1), dyspepsia (UR: 1), urinary tract infection (UR: 1), cancer (UR: 1) |

(continued on next page)
| No. | Family       | Botanical name and voucher number (new plant records in bold) | Local name | Habitus/PG(IUCN) | Part(s) used | Preparation | Utilization method | UR | FC | Therapeutic effect (Use Report: UR) |
|-----|--------------|---------------------------------------------------------------|------------|------------------|--------------|-------------|-------------------|----|----|-------------------------------------|
| 102 | Rosaceae     | Crataegus rhododictylos Cand. MK-1593                         | Aliç       | S/PR/LC          | Fru          | Inf, Jam, Raw | Dtt, Dte, Eat     | 5  | 4  | Influenza (UR: 1), common cold (UR: 1), urinary tract infection (UR: 1), cardiovascular (UR: 2) |
| 103 | Rosaceae     | Cydonia oblonga Mill. MK-1486                                 | Ayva       | T/Cul            | Fru, Lea, Flo| Raw, Dec, Inf | Raw, Dot, Dtt     | 15 | 13 | Influenza (UR: 4), common cold (UR: 3), cough (UR: 2), diarrhea (UR: 2), stomach disorders (UR: 1), dyspepsia (UR: 1), dysmenorrhea (UR: 1) |
| 104 | Rosaceae     | Fragaria vesca L. MK-1573                                     | Mayas çileği, Ham çilek Elma | H/CB/LC | Lea, Fru | Cru, Dec, Raw, Jam Inf, Mol, Raw | Com, Dot, Eat | 6   | 5  | Anemia (UR: 3), wounds (UR: 1), antipyretic (UR: 1), sedative (UR: 1) |
| 105 | Rosaceae     | Malus sylvestris (L.) Mill. MK-1553                           | Kiraz      | T/Cul/DD         | Fru          | Cru, Dec, Raw Fru Inf, Mol, Raw | Dot, Eat | 3   | 3  | Migraine (UR: 1), anemia (UR: 1), dyspepsia (UR: 1) |
| 106 | Rosaceae     | Malus germanica L. MK-1362                                    | Tüngel     | T/CB/LC          | Fru, Lea, See| Mol, Dec, Raw | Eat, Dot | 13  | 11 | Dyspepsia (UR: 5), diarrhea (UR: 2), diabetes (UR: 1), stomach ache (UR: 1), dysmenorrhea (UR: 1), intestinal disorder (UR: 1), dyspepsia (UR: 1), common cold (UR: 1) |
| 107 | Rosaceae     | Prunus armeniaca L. MK-1522                                   | Kayss      | T/Cul            | Fru          | Raw         | Raw               | 1  | 1  | Intestinal disorder (UR: 1) |
| 108 | Rosaceae     | Prunus avium (L.) L. MK-1523                                  | Kiraz      | T/Cul/LC         | Roo, Ped | Dec | Dot, Dtt, Dam | 16  | 15 | Whooping cough (UR: 2), stomach disorder (UR: 2), dyspepsia (UR: 2), kidney stone (UR: 2), oedema (UR: 2), constipation (UR: 1), lose weight (UR: 1), cough (UR: 1), hemorrhoids (UR: 1), urinary tract infection (UR: 1), kidney sand (UR: 1) |
| 109 | Rosaceae     | Prunus domestica L. MK-1589                                   | Erik       | T/PR             | Flo, Fru    | Dec, Raw     | Dtt, Raw          | 2  | 2  | Constipation (UR: 2) |
| 110 | Rosaceae     | Prunus laurocerasus L. MK-1500                                | Taflan, Karayemiş | T/PR/LC | Lea, Fru | Dec, Raw, Mol, Boi, Hea, Jam, Pic | Dot, Raw, Eat, Com | 52  | 46 | Diabetes (UR: 22), sore throat (UR: 7), tonsillitis (UR: 5), stomach disorder (UR: 4), anemia (UR: 3), cough (UR: 2), burn (UR: 2), rheumatism (UR: 2), intestinal disorder (UR: 1), headache (UR: 1), joint pain (UR: 1), dyspepsia (UR: 1), bone fracture (UR: 1) |
| 111 | Rosaceae     | Pyrus caucasicus Fed. MK-1598                                 | Armut      | T/PR             | Fru          | Vin, Raw     | Dot, Eat          | 2  | 1  | Vasodilator (UR: 1), dyspepsia (UR: 1) |
| 112 | Rosaceae     | Rosa canina L. MK-1497                                        | Kuşburnu  | S/PR/LC          | Fru, See    | Dec, Inf, Mar | Dtt, Dot, Eat     | 22  | 16 | Influenza (UR: 8), common cold (UR: 4), diabetes (UR: 2), stomach ache (UR: 1), tonic (UR: 1), hyperperfusion (UR: 1), diverticulosis (UR: 1), dyspepsia (UR: 1), hemorrhoids (UR: 1), herpes zoster (UR: 1), cough (UR: 1), dyspepsia (UR: 1) |
| 113 | Rosaceae     | Rosa gallica L. MK-1591                                       | Gül        | S/PR             | Flo          | Inf          | Dtt               | 2  | 1  | Tonsillitis (UR: 1), sore throat (UR: 1) |
| 114 | Rosaceae     | Rubus canescens DC. MK-1526                                   | Ağabağıştırlı  | S/CB | Roo, Fru, Lea | Cru, Raw, Dec | Com, Che, Dot | 6   | 5  | Aphthae (UR: 1), burn (UR: 1), cancer (UR: 1), diarrhea (UR: 1), gingival bleeding (UR: 1), hyperperfusion (UR: 1) |
| 115 | Rosaceae     | Rubus hirtus Waldst. & Kitz. MK-1581                          | Kara borçgırlı  | S/CB | Roo, Sho, Fru | Ash, Cru, Raw | Com, Eat | 10  | 8  | Wounds (UR: 2), burn (UR: 1), hemostatic (UR: 1), tonic (UR: 1), hemorrhoids (UR: 1), anemia (UR: 3), dyspepsia (UR: 1) |
| 116 | Rosaceae     | Rubus idaeus L. MK-1572                                       | Ahududu    | S/PR/LC          | Fru, Flo    | Raw, Dec     | Eat, Dot          | 5   | 4  | Diarrhea (UR: 1), tonsillitis (UR: 1), tonic (UR: 1), dyspepsia (UR: 1), anemia (UR: 1) |
| 117 | Rutaceae     | Citrus limon (L.) Osbeck MK-1515                               | Limon      | T/Cul            | Fru         | Cru, Dec, Jui | Dam, Dot         | 6   | 6  | Immune system booster (UR: 2), common cold (UR: 1), influenza (UR: 1), lose weight (UR: 1), hyperperfusion (UR: 1) |
| 118 | Santalaceae  | Viscum album L. subsp. austricum (Wiesb.) Vollm. MK-1503       | Çekum, Oksuo, Gökçeotu | VP/PR | Fru, Lea, See | Dec, Inf, Cru, Raw | Dot, Com, Raw | 25  | 21 | Abdominal pain (UR: 4), diabetes (UR: 4), hypertension (UR: 4), cancer (UR: 3), stomach ache (UR: 2), wounds (UR: 2), cough (UR: 1), cholesteral (UR: 1), diarreal (UR: 1), dyspepsia (UR: 1), cardiovascular (UR: 1), prostatitis (UR: 1) |
Table 2 (continued)

| No. | Family       | Botanical name and voucher number (new plant records in bold) | Local name | Habituation/PG/IUCN | Part(s) used | Preparation | Utilization method | UR | FC | Therapeutic effect (Use Report: UR) (new uses are indicated in bold) |
|-----|--------------|---------------------------------------------------------------|------------|---------------------|--------------|-------------|-------------------|----|----|------------------------------------------------------------------|
| 119 | Smilacaceae  | Smilax excelsa L. MK-1584                                     | Tikencucu, Melolcan, Dikenacucu | C/CB               | Roo, Lea, Ste | Inf, Coo, Dec, Pic, Fre | Dot, Eat, Dtt, Com | 16 | 11 | Carminative (UR: 3), dyspepsia (UR: 3), stomach disorder (UR: 2), kidney stone (UR: 2), insomnia (UR: 1), common cold (UR: 1), antipyretic (UR: 1), analgesic (UR: 1), acne (UR: 1), diabetes (UR: 1), Tootahche (UR: 1) |
| 120 | Solanaceae   | Hyoscyamus niger L. MK-1545                                   | Banotu     | H/PR                | See           | Raw         | Che               | 1  | 1  | Wounds (UR: 4), hemostatic (UR: 3)                                 |
| 121 | Solanaceae   | Nicotiana tabacum L. MK-1509                                   | Tutun      | H/Cul               | Lea           | Fre, Cru    | Com               | 7  | 7  |                                                                                |
| 122 | Solanaceae   | Solanum tuberosum L. MK-1566                                   | Patates    | H/Cul               | Roo           | Fre         | Ex, Com           | 8  | 7  | Headache (UR: 6), burn (UR: 1), wounds (UR: 1)                       |
| 123 | Taxaceae     | Taxus baccata L. MK-1527                                       | Ardiç, Porsuk | T/PR/RC          | Lea, Flo      | Dec         | Ex, Doo           | 3  | 3  | Scabbl (UR: 2), eczema (UR: 1)                                      |
| 124 | Theaceae     | Camellia sinensis (L. ) Kunte MK-1540                         | Çay        | S/Cul               | Lea           | Inf         | Dam               | 2  | 2  | Disyepisia (UR: 2)                                                   |
| 125 | Urticaceae   | Parietaria judaica L. MK-1596                                  | Çan anuju  | H/PR                | Lea           | Inf, Cru    | Dot, Com          | 2  | 2  | Sore throat (UR: 1), constipation (UR: 1)                            |
| 126 | Urticaceae   | Urtica dioica L. MK-1507                                      | Sirgan     | H/CB/RC            | Lea, Ste, Flo, See, Roo | Dec, Coo, Cru, Inf | Dam, Eat, Dtt, Dbm, Com, Jui, Was | 67 | 53 | Cancer (UR: 19), abdominal pain (UR: 13), oedema (UR: 4), stomach disorder (UR: 3), wounds (UR: 3), analgesic (UR: 4), diabetes (UR: 2), heart loss (UR: 2), immune system booster (UR: 2), rheumatism (UR: 2), dyspepsia (UR: 1), tuberculous (UR: 1), anti-inflammatory (UR: 1), common cold (UR: 1), stomach ache (UR: 1), gout (UR: 1), diuretic (UR: 1), constipation (UR: 1), menstrual irregularity (UR: 1), kidney disorder (UR: 1), dysmenorrhea (UR: 1), intestinal disorder (UR: 1), intestinal worm (UR: 1), hypotension (UR: 1), prostatitis (UR: 1) |
| 127 | Vitaceae     | Vitis labrusca L. MK-1563                                      | Kokulu izüüm | C/Cul              | Fru           | Mol         | Eat               | 7  | 7  |                                                                                |
| 128 | Vitaceae     | Vitis vinifera L. MK-1587                                      | Asma, Tevk | C/Cul              | Fru, Lea      | Raw, Fre    | Che, Com          | 2  | 2  | Anemia (UR: 6), Iron deficiency (UR: 1), headache (UR: 1)            |

Habituation: H: Herb; S: Shrub; T: Tree; C: Climber; PG: Phytogeographical region: Cul: Cultivation; CB: Circumboreal; Med: Mediterranean; IT: Irano-Turanian; PR: Pluri-Region; IUCN: International Union for Conservation of Nature; EN: Endangered; LC: Least Concern; DD: Data Deficient.

* Plant part(s) used: Aer: Aerial parts; Bar: Bark; Bra: Bracts; Cla: Cladode; Con: Cones; Flo: Flowers; Fru: Fruits; Hus: Husk; Kin: Kindling; Lat: Latex; Lea: Leaves; Mal: Male flowers; Nec: Nectary; Ped: Pedicel; Pet: Petole; Res: Resin; Roo: Root; See: Seed; Sho: Shoot; Ste: Stem; Sty: Styles; Who: Whole plant.

* Preparation: Alc: Alcohol; Boil: Boiling; Bur: Burning; Coo: Cooking; Cru: Crushing; Dec: Decocation; Dir: Direct application; Hea: Heating; Hon: Honey; Inf: Infusion; Jui: Juice; Mar: Marmalade; Mol: Molasses; Ms: Mash; Oil: Pic; Picke: Pom: Pomade; Pow: Powder; Roa: Roasting; Sp: Spice; Vap: Vapor; Vin: Vinegar.

* Utilization method: Che: Chewing; Com: Compress; Dam: Drink after meal; Dbm: Drink before meal; Doo: Drink on an empty stomach; Dst: Drink 1 spoon; Dtt: Drink two times in a one day; Eat: Eaten as meal; Ex: Externally; Fum: Fumigant; Inh: Inhalation; Mou: Mouthwash; Sme: Smelling; Swa: Swallowing; Raw: Eaten raw; Was: Washing.

Local people collect some medicinal plants seasonally and sell them at restaurants, local bazaars, and markets to generate income. In Güce district, wild plants that generate income include Castanea sativa, Fragaria vesca L., Helichrysum arenarium (L.) Moench subsp. aucheri (Boiss.) P.H. Davis & Kupicha, Mespleius germanico L., Ornithogalum sigmaeoidem Fresyn & Sint., Prunus avium, P. laurocerasus L., Pyrus caucasica Fed., Rubus canescens DC., R. hirtus Waldst. & Kit., Thymus nummularius M. Bieb., T. praecox Opiz subsp. grossheimi (Ronninger) Jalas, Tilia rubra subsp. caucasica, Trachystemon orientalis (L.) D. Don, Urtica dioica, and Vaccinium myrtillus L. In addition to these, some plants such as Brassica oleracea L., Corylus avellana L., Zea mays, Vitis vinifera L., and V. labrusca L. are cultivated both for personal use and as supplemental income. Turkey ranks second globally in honey production (Karaköse et al., 2018a). Unsurprisingly, honey production in Güce district is important. Both mono-floral and poly-floral honey types are produced. Mono-floral honeys, especially Castanea sativa and Rhododendron spp., are particularly popular. Furthermore, in Boncukçuk village of Güce, honey derived from Vitis sempervires L., Tilia rubra subsp. caucasica, and Hedera helix L. is produced. Chestnut honey is used as an expectorant, tonic, and aphrodisiac in the region. Other honey types (honey obtained from Rhododendron spp. is known as “mad honey”), on the other hand, are considered dangerous due to their active ingredients, but are consumed in small amounts to reduce blood pressure.

In ethnobotanical studies, information about gynecological diseases is sometimes difficult to obtain due to the hesitation or shyness of female informants, who consider talking about the diseases taboo (as women’s diseases). In this study, extensive data on gynecological diseases were obtained due to the friendly atmosphere between the study team and the informants. A total of 21 plants are used to treat five gynecological disorders. Of these, the highest UR value was for dysmenorrhea (UR: 15), followed by menstrual irregularity (UR: 4), menopause, unwanted pregnancy, and postpartum pain (UR: 1 for each).
During the research, some interesting usages by the local people were also identified. For instance, it was learned that the meal made with the fresh leaves of *Aegopodium podagraria* L. causes swelling in the hands of kidney patients; thus, local people guess that a person with swelling in their hands has kidney disease. The leaf of *Sambucus ebulus* L. is applied directly to affected areas to relieve irritation or allergy caused by *Urtica dioica*. *Cyclamen coum* Mill. subsp. *caucasicum* (K. Koch) O. Schwarz is applied directly to the genital area in the first month of pregnancy to abort an unwanted pregnancy. However, informants noted that this practice is dangerous. The green foam that is left after boiling *Urtica dioica* is used to treat cancer.

### 3.3. Preparation—utilization method and plant parts used

Data obtained from Gúcê district indicate that local people prepare medicinal plants using simple methods. Application of medicinal remedies can be grouped into five categories: oral (79.1%), topical (19.0%), wash (0.9%), inhale (0.8%), and eye-ear drop (0.2%). Medicinal remedies are prepared and utilized by a variety of methods (see Table 2). For example, medicinal remedies are prepared by decoction, cooking, pickling, as honey, or applied from directly. Utilization methods include chewing, drinking after a meal, eating, inhaling, and washing. The most frequently preferred methods for preparing folk medicines were decoction (40.2%),
followed by cooking (10.4%), raw (10.1%), direct application (9.8%), and infusion (8.4%) (Fig. 5). Similar results have been observed near the study area (Polat et al., 2015; Yesilyurt et al., 2017), at the national scale (Paksoy et al., 2016; Gunes, 2017; Gunes et al., 2017; Karcı et al., 2017), and in other countries (Gu et al., 2020; Hosseini et al., 2021).

Local people use different plant parts for medicinal purposes. A total of 1246 URs were reported on plant parts. Folk medicines in Güce district are mainly prepared from leaves (502 URs/40.3%), followed by flowers (230 URs/18.5%), fruit (178 URs/14.3%), root (73 URs/5.9%), and seed (56 URs/4.5%) (Fig. 6). Several ethnobotanical studies have indicated that the leaf is the most frequent plant part used in folk medicine (Güler et al., 2015; Polat et al., 2015; Xiong et al., 2020; Mehrnia et al., 2021; Hosseini et al., 2021; Mir et al., 2021; Khajuria et al., 2021). The high usage frequency of leaves can be explained by the fact that they are easily collected, stored, densely presented, and supplied with various secondary metabolites. Usually, medicinal plants are seasonally used. However, some additional measures are taken to ensure that they are ready at hand in extraordinary situations. Local people have the opportunity to find the majority of medicinal plants in nature during the summer season. However, to benefit from these plants in other seasons, they dry some important medicinal plants. These herbs include *Thymus nummularius*, *T. praecox* subsp. grossheimii, *Tilia rubra* subsp. caucasica, *Alchemilla caucasica*, *Mentha spicata* L., *M. pulegium* L., *Urtica dioica*, *Malva sylvestris* L., *Polygonum carneum* C. Koch, *Prunus avium*, *Bellis perennis* L., *Tanacetum parthenium* (L.) Sch. Bip., *Tripleurospermum elongatum* (DC.) Bornm., *Helichrysum arenarium* subsp. aucheri, *Platanus orientalis* L., *Viscum album* L. subsp. austriacum (Wiesb.) Vollm., *Pteridium aquilinum*, and *Cydonia oblonga* Mill. The parts of the dried plants that do not decay, such as leaves, flowers, and seeds, are preferred. During the winter months, fruits and stems are often converted into products (e.g., vinegar, molasses, jam, pickles, and marmalade) for medicinal consumption.

### 3.4. Frequency of citation and use reports

Overall, male participants (111 plants) reported a greater number of medicinal plants than did female participants (105 plants), suggesting that males have more knowledge about the use of medicinal plants. This can be explained by the fact that the number of male participants was higher than that of females. However, analysis of FC indicates that individual female informants reported...
significant numbers of medicinal plants than did male informants \((df = 163, p = 0.037 < 0.05)\). Specifically, female informants cited an average of 7.48 plant names, whereas male informants reported an average of 5.65 \((\text{the mean use-value of the entire sample is 6.38})\). These findings indicate that females possess greater knowledge about medicinal plant uses. Similarly, TK according to UR is similar to the number of plant species given by informants. In the current study, a total of 1352 URs belonging to 128 plant taxa were mentioned by informants. Of the 1352 URs, 52.8% \((714 \text{ URs})\) were obtained from male and 47.2% \((638 \text{ URs})\) from female informants. Statistical analysis indicated that when TK was considered as the number of plants cited, female informants possessed more knowledge \((df = 163, p = 0.043 < 0.05)\). These results are consistent with previous studies \(\text{(de Albuquerque et al., 2011; Gauve et al., 2017)}\). The FCs show the local importance of each plant taxon based on the informants who mentioned the uses of these plants \(\text{(Hussain et al., 2019)}\). The 165 informants from Güce district reported a total of 1052 FCs \(\text{(Table 2)}\). The most cited plant taxon was \(\text{Tilia rubra subsp. caucasica (61)}\). \(\text{Tilia rubra subsp. caucasica}\) is commonly used in the study area for influenza \(\text{(UR: 41)}\), common cold \(\text{(UR: 37)}\), cough \(\text{(UR: 4)}\), for expectorant purposes \(\text{(UR: 2)}\), as a sedative \(\text{(UR: 2)}\), for asthma \(\text{(UR: 1)}\), for analgesic purposes \(\text{(UR: 1)}\), for bronchitis \(\text{(UR: 1)}\), for hair loss \(\text{(UR: 1)}\), as a blood purifier \(\text{(UR: 1)}\), and for hypertension \(\text{(UR: 1)}\). The other most mentioned medicinal plant taxa in Güce district are \(\text{Urtica dioica} \) \(\text{(53)}\), \(\text{Prunus laurocerasus} \) \(\text{(46)}\), \(\text{Pinus sylvestris} \) \(\text{var. hamata} \) \(\text{(35)}\), \(\text{Plantago lanceolata L.} \) \(\text{(31)}\), and \(\text{Thymus praecox subsp. grossheimii} \) \(\text{(27)}\). The reason these plants have high FC values is that they are easily found in the study area and, therefore, easily collected. \(\text{Tilia rubra subsp. caucasica}\) had the highest number of UR \((92 \text{ URs})\), followed by \(\text{Urtica dioica}\) and \(\text{Pinus sylvestris} \) \(\text{var. hamata} \) with 67 and 60 URs, respectively. This is the first study to calculate FC and UR values in Güce district. Therefore, these findings were compared to one ethnobotanical study conducted within the Colchic sector of the Circumboreal phytogeographical region in Turkey. UR values in the Güce district were similar to those calculated for areas close to the borders of two neighboring countries \(\text{(Turkey and Georgia)}\), where \(\text{Plantago major L.}\) ranked first \((89 \text{ URs})\), \(\text{Urtica dioica}\) ranked second \((54 \text{ URs})\), and \(\text{Picea orientalis}\) ranked third \((43 \text{ URs})\) \(\text{(Kazanci et al., 2020)}\). For the regions bordering Georgia with Turkey, \(\text{Plantago major}\) \(\text{(with 65 URs)}\) is again the most frequently cited, followed by \(\text{Urtica dioica}\) \(\text{(with 62 URs)}\) and \(\text{Anthemis sp.} \) \(\text{(with 43 URs)}\).

### 3.5. Informant consensus factor

When ICPC-2 classification was used to investigate consensus among informants on medicinal plant species, sixteen ailment categories were identified \(\text{(Table 3)}\). A total of 101 therapeutic effects were reported from Güce district. The main ailments, based on URs, were influenza \(\text{(UR: 118)}\), common cold \(\text{(UR: 114)}\), dyspepsia \(\text{(UR: 95)}\), wounds \(\text{(UR: 69)}\), diabetes \(\text{(UR: 60)}\), stomach disorder \(\text{(UR: 57)}\), cough \(\text{(UR: 47)}\), abscess \(\text{(UR: 43)}\), cancer \(\text{(UR: 40)}\), anemia \(\text{(UR: 32)}\), abdominal pain \(\text{(UR: 27)}\), rheumatism \(\text{(UR: 27)}\), dyspepsia \(\text{(22)}\), cholesterol \(\text{(UR: 20)}\), headache \(\text{(UR: 20)}\), bronchitis \(\text{(UR: 19)}\), cardiovascular diseases \(\text{(UR: 19)}\), hemorrhoids \(\text{(UR: 19)}\), and constipation \(\text{(UR: 18)}\). ICF of ailment categories in this study ranged from 0 to 0.86 \(\text{(Table 3)}\). The highest ICF \(\text{(0.86)}\) value was calculated for respiratory system disorders \(\text{(e.g., influenza, common cold, cough, dyspepsia, bronchitis, sore throat, expectorant, tonsillitis, asthma, sinusitis, lung disease, whooping cough, and nasal passages)}\). This result was expected for two reasons. Firstly, local people in the villages mostly make their living from animal husbandry, forestry, and agricultural activities. They migrate to the highlands with their animals to spend the summer months. During winter they return to their villages. Thus, in almost every season, they live in cold weather conditions and frequently encounter respiratory diseases such as influenza, common cold, bronchitis, and cough. A second reason may be related to air pollution \(\text{(Palaş Uzun and Koca, 2020)}\). A report on air pollution in Turkey states that the air pollution level is \(31\%\) higher than that in Europe \(\text{(UCTEA, 2019)}\). This raises the risk of contracting respiratory diseases. This study found that 55 plant taxa \(\text{(with 375 URs)}\) were used to treat different respiratory system disorders. The plant taxa most commonly reported for use in the treatment of respiratory system disorders are \(\text{Tilia rubra subsp. caucasica (UR: 86)}\), \(\text{Thymus praecox subsp. grossheimii (UR: 33)}\), \(\text{Pinus sylvestris} \) \(\text{var. hamata (UR: 33)}\), \(\text{Thymus nummularius} \) \(\text{(UR: 20)}\), \(\text{Tripleurospermum elongatum} \) \(\text{(UR: 17)}\), \(\text{Bellis perennis} \) \(\text{(UR: 17)}\), \(\text{Mentha pulegium} \) \(\text{(UR: 15)}\), \(\text{Prunus laurocerasus (UR: 14)}\), \(\text{Rosa canina L.} \) \(\text{(UR: 14)}\), \(\text{Picea orientalis (UR: 10)}\), and \(\text{Cynodon oblonga (UR: 10)}\). The second-highest ICF value \(\text{(0.73)}\) was calculated for digestive system disorders \(\text{(e.g., dyspepsia, stomach disorder, abdominal pain, constipation, stomachache, carminative, diarrhoeal, intestinal disorders, nausea, intestinal worm, liver steatosis, toothache, aphthae, ulcer, mumps, hepatitis, gall bladder, and gingival bleeding)}\). This finding is likely the result of local eating habits, which are typified by spicy, milky, and carbohydrate-heavy food \(\text{(Yeşildal et al., 1993; Dalar et al., 2018)}\). The third highest ICF value \(\text{(0.71)}\) was calculated for skin disorders \(\text{(e.g., wounds, abscesses, inflammation)}\) included \(\text{Anthemis sp.} \) \(\text{(with 43 URs)}\), \(\text{Cydonia oblonga} \) \(\text{(with 46 URs)}\), \(\text{Alnus glutinosa} \) \(\text{(with 20 URs)}\), and \(\text{Plantago lanceolata L.} \) \(\text{(with 18 URs)}\). The other major categories in this study range from 0 to 0.86 (Table 3)
Consensus could not be achieved in some ailment categories (eye, pregnancy-childbearing-family planning, and male genital) due to the low number of informants; thus, ICF values were calculated as 0 (zero).

This is the first study to calculate ICF values in Gümüş. Previous studies have indicated that ICF values vary across the Black Sea region. For example, an ethnomedical study conducted in a district neighboring Gümüş found the highest ICF value for oncological diseases (0.43) diseases. Bak and Çifçi (2020), however, reported that the highest ICF in the same region was for muscle-skeletal system disorders (0.691) and dermatological system disorders (0.56) (Karcı et al., 2021). These findings demonstrate that respiratory, digestive, and dermatological disorders are widespread in the study area and throughout the Black Sea region. These findings are also an indication that the traditional use of medicinal plants in the Black Sea region, which includes the town of Gümüş, continues. High ICF values can also be used in further studies to search for secondary metabolites of these medicinal plants.

### 3.6. Conservation status of medicinal plants

Plants are an important element of any ecosystem, and their protection is essential for the continuity of life. According to IUCN (Allen et al., 2014), almost half of the medicinal plants used on earth are under threat, and necessary precautions are needed for the survival of threatened plant species. For this purpose, plants in the priority conservation class in Turkey are under protection by national laws and some international regulations such as The Convention on Biological Diversity, Bern Convention (The Convention on the Conservation of European Wildlife and Natural Habitats), CITES (The Convention on International Trade in Endangered Species of Wild Fauna and Flora), etc. This study identified three endemic plants used for medicinal purposes, namely Lilium ciliatum P.H. Davis, Helichrysum arenarium subsp. aicheri, and Carduus onopordoides Fisch. ex M. Bieb. subsp. turcicus (Kazmi) P.H. Davis (Table 2). However, some medicinal taxa have been included in the “under-threat” categories by IUCN ([https://www.iucnredlist.org/]) due to the negative effects on population sizes resulting from the overuse by human beings on a regional or global scale. This study identified 43 medicinal taxa belonging to this category. Four medicinal taxa are categorized as Data Deficient (DD) and 39 taxa as Least Concern (LC). In addition to these taxa, this study identified two medicinal taxa (Cyclamen coum subsp. caucasicum and Vaccinium arctostaphylos) in the study area.

### Table 3

ICF values for ICPC-2 ailment categories.

| AICPC-2 Categories | Ailments                                                                 | Nur | Nt    | ICF  |
|--------------------|-------------------------------------------------------------------------|-----|-------|------|
| A-General and Unspecified | Cancer (UR: 40), analgesic (UR: 17), antipyretic (UR: 11), oedema (UR: 11), tonic (UR: 10), hemostatic (UR: 8), apherodiasiac (UR: 2), tumorous (UR: 1) | 100 | 42    | 0.59 |
| B-Blood, Blood Forming Organs and Immune Mechanism | Anemia (UR: 32), iron deficiency (UR: 3), blood purifier (UR: 3) | 38  | 15    | 0.62 |
| D-Digestive | Dyspepsia (UR: 95), stomach disorder (UR: 57), abdominal pain (UR: 27), constipation (UR: 18), stomachache (UR: 17), carminative (UR: 14), diarrheal (UR: 14), intestinal disorder (UR: 13), nausea (UR: 7), intestinal worm (UR: 6), liver steatosis (UR: 6), toothache (UR: 5), aphthae (UR: 4), ulcer (UR: 3), mumps (UR: 2), hepatitis (UR: 2), gall bladder (UR: 2), gingival bleeding (UR: 1) | 293 | 80    | 0.73 |
| F-Eye | Eye diseases (UR: 2) | 2   | 2     | 0.70 |
| H-Ear | Earache (UR: 3) | 3   | 2     | 0.52 |
| K-Cardiovascular | Hypertension (UR: 20), cholesterol (UR: 20), hemorrhoids (UR: 19), cardiovascular (UR: 19), hypotension (UR: 2), vasodilator (UR: 2), varicose (UR: 1) | 83  | 39    | 0.54 |
| L-Musculoskeletal | Rheumatism (UR: 27), bone fracture (UR: 12), joint pain (UR: 6), osteoarthritis (UR: 4), backache (UR: 2), herniated disc (UR: 1) | 52  | 19    | 0.65 |
| N-Neurological | Headache (UR: 20), neurosis (UR: 6), migraine (UR: 2), epilepsy (UR: 1), tetanus (UR: 1) | 30  | 18    | 0.41 |
| P-Psychological | Sedative (UR: 7), insomina (UR: 6) | 13  | 9     | 0.33 |
| R-Respiratory | Influenza (UR: 118), common cold (UR: 114), cough (UR: 47), dyspnea (UR: 22), bronchitis (UR: 19), sore throat (UR: 15), expectorant (UR: 12), tonsilitis (UR: 10), asthma (UR: 7), sinusitis (UR: 5), lung disease (UR: 3), whooping cough (UR: 2), nasal passages (UR: 1) | 375 | 55    | 0.86 |
| S-Skin | Wounds (UR: 69), abscess (UR: 43), anti-inflammatory (UR: 18), burn (UR: 13), scabby (UR: 11), eczema (UR: 7), anti-fungal (UR: 6), hair loss (UR: 5), acne (UR: 5), wart (UR: 5), herpes zoster (UR: 4), anti-allergy (UR: 3), antiseptic (UR: 3), atopic dermatitis (UR: 2), intertrigo (UR: 2), skin disease (UR: 1), callus (UR: 1), scorpion sting (UR: 1), anti-dandruff (UR: 1) | 200 | 58    | 0.71 |
| T-Endocrine/Metabolic and Nutritional | Diabetes (UR: 60), immunity (UR: 12), lose weight (UR: 8), inappetence (UR: 5), galactagogue (UR: 3), diaphoretic (UR: 1), gout (UR: 1) | 90  | 35    | 0.62 |
| U-Urological | Urinary tract infection (UR: 16), diuretic (UR: 11), kidney disorder (UR: 11), kidney stone (UR: 10), kidney sand (UR: 1) | 49  | 27    | 0.46 |
| W-Pregnancy, Childbearing, Family Planning | Unwanted pregnancy (UR: 1), postpartum pain (UR: 1) | 2   | 2     | 0.70 |
| X-Female Genital | Dysmenorrhea (UR: 15), menstrual irregularity (UR: 4), menopause (UR: 1) | 20  | 13    | 0.37 |
| Y-Male Genital | Prostate (UR: 2) | 2   | 2     | 0.70 |
anthropogenic factors harm natural plant populations by damaging the habitats of the species, allowing alien species to settle and reproduce in the ecosystem (Karakoş et al., 2018b). In the eastern Black Sea region, where Güçe is located, inappropriate land use is prevalent. For example, Alnus glutinosa forests are commonly clear-cut to plant hazelnut orchards. These orchards, and other artificial areas (e.g., agriculture, roadsides etc.) create new ecosystems in which alien plants flourish (Karakoş et al., 2018b). Conservation efforts should be started urgently to protect medicinal species in such transformed areas in the Güçe district.

3.7. Novelty and future prospects

When I compared the ethnomedicinal knowledge of Güçe with that of surrounding regions, I found that nine of the 12 medicinal plant taxa recorded here had been previously recorded in north-eastern Turkey and other countries located in the Circumboreal phytogeographical region (Table 2). These plant taxa are Alchemilla myrtillae, Juncus articulatus G. Koch, Luzula sylvatica (Huds.) Gaudin, Ornithogalum sigmoideum, Prenanthes petiolaris (K. Koch) Sennikov, Ruscus colchicus Veo, Taraxacum olearum E. E. Haigl., and Tripleurospermum elongatum. In addition to these, 2013 Therapeutic uses of these plants were recorded in the first time (indicated in bold font in Table 2). For example, some of the newly documented uses include Equisetum telmateia (herniated disc), Arum maculatum (herpes zoster), Alchemilla myrtillae (menstrual irregularity, dysmenorrhea), Crotalaria reticulata (urinary tract infection), Mesembis germanum (dysmenorrhea), Prunus avium (whooping cough), Vitus vinifera (toothache), Quercus petraea subsp. iberica (cancer, liver steatosis). These medicinal plant taxa and their uses should be further investigated to identify their active ingredients and pharmacological properties.

This study determined that the most popular and medicinal plant taxa throughout the Circumboreal phytogeographical region are Achillea millefolium L., Allium cepa L., A. sativum L., Bellis perennis L., Bistorta officinalis, Chelidonium majus L., Cornus mas L., Dioscorea communis (L.) Caddick & Wilkin, Ficus carica L., Hedera helix, Hypericum perforatum L., Juglans regia L., Mentha spicata, Morus alba L., M. nigra L., Pinus sylvestris var. hamata, Plantago lanceolata, P. major, Rosa canina, Sambucus ebulus, S. nigra L., Tussilago farfara L., Urtica dioica, Vaccinium myrtillus, and Zea mays (Vokou et al., 1993; Ivancheva and Stantcheva, 2000; Leporatti and Ivancheva, 2003, Pieroni et al., 2003, 2014a, 2015; Jarić et al., 2007, 2015; Rigat et al., 2007; Leonti et al., 2009; Atik et al., 2009; Mustafa et al., 2012, 2016; Papi et al., 2013; Rexhepi et al., 2013; Bussmann et al., 2016a, 2017a, 2018; Sökand and Pironi, 2016, 2019; Lumentz and Kerst, 2014; Pironi, 2017; Jafarirad and Rasoulpour, 2019; Savić et al., 2019; Varga et al., 2019; Matejić et al., 2020; Mattalia et al., 2020, 2021; Sulaiman et al., 2020; Züla Pfeiffer et al., 2020; Lutzaj et al., 2021; Nullajlo et al., 2021), which are also commonly used in Güçe and across Turkey (Sezik et al., 1991, 1997, 2001; Yesilada et al., 1993, 1995, 1999; Tabata et al., 1994; Fujita et al., 1995; Vazquezglu and Tuzlacı, 1995; Honda et al., 1996; Tuzlacı and Erol, 1999; Tuzlacı and Tolon, 2000; Tuzlacı and Aynı, 2001; Yesilada, 2002; Everett and Öztürk, 2005; Ezer and Anar, 2006; Genç and Özhatay, 2006; Koçyiğit and Öztukay, 2006; Kültür, 2007; Uysal et al., 2010; Gürdal and Kültür, 2013; Bulut and Tuzlacı, 2013, 2015; Yesilirli et al., 2016; Aydın and Yeşil, 2018; Gürbüz et al., 2018; Palabığ Uzun and Koca, 2020; Emre et al., 2021). The reason for the widespread use of these plant taxa is that they are cosmopolitan species and can easily be found in any habitat.

The medical usages identified in the study area were consistent with those of previous studies. For example, medicinal uses were similar across the region for Equisetum telmateia (stomach disorders), Aspidium scolopendrium L. (coughs), Arum maculatum L. (hemorrhoids), Dioscorea communis (L.) Caddick & Wilkin (rheumatism), Helleborus orientalis (wound healing), Buxus sempervirens (antipyretic), Cydonia oblonga (influenza, the common cold), Prunus laurocerasus (diabetes), Quercus petraea subsp. iberica (diarrhea), Plantago lanceolata (abscesses, wounds, inflammations), and Urtica dioica (cancer).

Güçe district is located in the Colchic sector of the Euxine province within the Circumboreal phytogeographical region. When I compared plant usage data from Güçe with that from previous studies of the Colchic sector (including Georgia), I found that medicinal plant usage in Güçe was most similar to that in Espiye (Giresun) (Polat et al., 2015) and least similar to that in north-eastern Anatolia (Sezik et al., 1991). These similarities are expected as Espiye is adjacent to Güçe and shares the same ecosystems (Yeşil and Inal, 2021). One reason that Güçe and north-eastern Anatolia show low similarity in plant usage may be related to the traditional data obtained from the areas belonging to the Iranian-Turanian (outside the Circumboreal phytogeographical region) phytogeographical region. Medicinal plant uses are similar across the Turkish division of the Colchic sector.

Güçe shares the use of 40 plant taxa with Espiye (Polat et al., 2015), 35 with Ordu (Türkan et al., 2008; Güld and Dinler, 2016; Aydin and Yeşil, 2018), 63 with Trabzon (Yazıcıoğlu and Tuzlacı, 1995; Akbulut and Bayramoğlu, 2014; Akbulut and Özkân, 2014; Gürdal and Kültür, 2013, 2015), 53 with Rize (Sarıoğlu et al., 2012; Sarac et al., 2013; Baykal and Atamov, 2017), 12 with Torul (Karakoş et al., 2019), and 33 with Artvin (Eminagaoglu et al., 2017; Bad and Çiçift, 2020). However, in the Turkish division of the Colchic sector, plants also have for different therapeutic uses. For example, in Hayrat, leaves of Rumex obtusifolius L. are used for the treatment of hemorrhoids (Sarıoğlu et al., 2012); in Güçe, leaves are used for the treatment of abscess, constipation, dysmenorrhea, dyspepsia, inappetence, and stomach disorder. In Hatila-Artvin, Cyclamen coum subsp. caucasicum is used for the treatment of jaundice (Eminagaoglu et al., 2017); in Güçe, it is used for the treatment of analgesic, diabetes, headache, sinusitis, tonsillitis, and unwanted pregnancy. Stachys sylvatica L. usage varies in different areas. In Espiye, its leaves are used for the treatment of cardiac disorders (Polat et al., 2015); in Sürmene-Trabzon, for dysuria (Gürdal and Öztürk, 2021); and in Güçe, for cancer. While leaves and flowers of the endemic Carduus onopordoides subsp. turcicus are recorded to be used as a blood purifier and for the treatment of dyspepsia and intestinal disorders in Güçe, in Torul-Gümüşhane it is used for the treatment of hemorrhoids (Karakoş et al., 2019).

Although Georgia is also located in the Colchic sector, its medicinal plant uses showed little similarity to those of Güçe district. One factor that may explain these differences is the distance between Georgia and Güçe district. Other factors may include differences in sub-flora and socio-cultural society structures between the two countries (Faruque et al., 2018). In Güçe, medicinal uses were detected for characteristic plant taxa belonging to the Colchic sector, such as Abies nordmanniana, Hedera colchica (K. Koch) K. Koch, Picea orientalis, Ruscus colchicus, and Rhododendron ponticum L. While Abies nordmanniana is used in the Turkish division of the Colchic sector for anti-inflammatory, antiseptic, expectorant, wound healing purposes and for the treatment of constipation (Baytop, 1999; Akbulut and Özkân, 2014), it is also used in the Georgian division for hemostatic and vulnerary purposes, as well as for the treatment of eczema, tuberculosis, and ulcer (Bussmann et al., 2016a, 2016b; Bussmann, 2017). While Picea orientalis is used to treat tuberculosis, ulcer, bronchitis, and wounds in the Turkish division (Yazıcıoğlu and Tuzlacı, 1995; Akbulut and Bayramoğlu, 2014) and the Georgian division (Bussmann et al., 2016a, 2016b; Bussmann, 2017).
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Appendix A. Supplementary data

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References

Akbulut, S., Karaköse, M., Özkân, Z.C., 2019. Traditional uses of some wild plants in kale and Acipayam provinces in Denizli. Kastamonu Univ. J. Forest. Fac. 19, 72–81.

Akbulut, S., Kurdoğlu, O., 2015. Türkiye’de acil ve oncülke korunması gereken bitkisel bitkilerin listesi. Bitk. Acil Ve Öncülük Derg. 3, 54–64.

Akbulut, S., Özkân, Z.C., 2014. Traditional usage of some wild plants in Trabzon region (Turkey). Kastamonu Univ. J. Forest. Fac. 14, 135–145.

Akbulut, S., Bayramoğlu, M.M., 2014. Reethnobotany of the Himalayas: safe-guarding medical practices and traditional uses of Kashmir regions. Biology 10, 282.

Alpers, P.D., 2004. The anatomy of the small intestine. Gastroenterology 127, 1867–1889.

Alperstein, A.G., Farnsworth, N.R., 1982. Traditional and modern uses of Indigofera tinctoria: an ethnobotanical, pharmacological and chemical survey. J. Ethnopharmacol. 5, 129–138.

Alexiades, M.N., 1996. Collecting Ethnobotanical Data: an Introduction to Basic Concepts and Techniques, Advances in Economic Botany. New York Botanical Garden Press, pp. 53–75.

Allen, D., Bilz, M., Leaman, D.J., et al., 2014. European Red List of Medicinal Plants. Publications Office of the European Union, Luxembourg.

Askani, S., Lemea, R., Sauv, F.H.H., 2020. Global trends of local ecological knowledge and future implications. PlOS One 13, e0195440.

Aydin, A., Yesil, Y., 2018. İkizce Ordu-Türkiye ilçesinde etnobotanik bir çalışma. Bağbaha Bil. Der. 5, 25–43.

Bak, F., Çekiç, K., 2020. Artnin merkez köylerinde bazı tibbi bitkilerin yöresel kullanlanları. Artnin Çoruh Orman Fak. Derg. 21, 318–329.

Baykal, H., Atamov, V., 2017. Ethnobotanical documentation of plants of Bağkara valley, Çoruh mountains national park, rize, Turkey. Bangladesh J. Bot. 46, 767–773.

Bayraktar, T., 1999. Türkiye’de Bitkilerle Tedavi. Nobel Tip Kitapçevleri, İstanbul.

Berkes, F., Colding, J., Folke, C., 2000. Rediscovery of traditional ecological knowledge: adaptive management. Ecol. Appl. 10, 1251–1262.

Berkes, F., Folke, C., Gadgil, M., 1995. Traditional ecological knowledge, biodiversity, resilience and sustainability. In: Perring, C.A., Male, K.G., Folke, C., Holling, C.S., Jansson, B.O. (Eds.), Biodiversity Conservation: Problems and Policies. Springer Netherlands, Dordrecht, pp. 281–299.

Berkes, F. 1993. Traditional ecological knowledge in perspective. In: Inglis, J.T. (Ed.), Traditional Ecological Knowledge: Concepts and Cases. Canadian Museum of Nature and International Development Research Centre, Ottawa, pp. 1–9.

Bhat, M.N., Singh, B., Surmal, O., et al., 2021. Ethnobotany of the Himalayas: safeguarding medical practices and traditional uses of Kashmir regions. Biology 10, 851.

Bulut, G., Haznedaroğlu, M.Z., Dogan, A., et al., 2017. An ethnobotanical study of medicinal plants in Acipayam (Denizli-Turkey). J. Herb. Med. 10, 64–81.

Bulut, G., Tuzlaoz, E., 2015. An ethnobotanical study of medicinal plants in Bayramic (Çanakkale-Turkey). Marmara Pharm. J. 19, 269–282.

Bulut, G., Tuzlaoz, E., 2013. An ethnobotanical study of medicinal plants in Turgutlu (Manisa-Turkey). J. Ethnopharmacol. 149, 633–647.

Bussmann, R., Panigia-Zambrana, N.Y., Sikharulidze, S., et al., 2017a. Plant and fungal use in Tusheti, Khevsureti, and Pshavi, sakartvelo (republic of Georgia). Caucasus. Acta Soc. Bot. Pol. 86, 3517.

Bussmann, R., Panigia-Zambrana, N.Y., Sikharulidze, S., et al., 2017b. Ethnobotany of samtska-Javakheti, sakartvelo (republic of Georgia), Caucasus. Indian J. Tradit. Knowl. 16, 7–24.

Bussmann, R., Panigia-Zambrana, N.Y., Sikharulidze, S., et al., 2018. Unequal brothers-plant and fungal use in Guria and Racha, sakartvelo (republic of Georgia). Caucasus. Indian J. Tradit. Knowl. 17, 7–33.

Bussmann, R., 2017. Ethnobotany of the Caucasus. Springer.

Bussmann, R., Panigia-Zambrana, N.Y., Sikharulidze, S., et al., 2016a. Medicinal and food plants of svaneti and Lechkhumi, sakartvelo (republic of Georgia), Caucasus. Med. Aromatic Plants 5, 1–18.

Bussmann, R., Panigia-Zambrana, N.Y., Sikharulidze, S., et al., 2016b. A comparative ethnobotany of Khevsureti, samtska-Javakheti, Tusheti, svaneti, and Racha-Lechkhumi, republic of Georgia (sakartvelo), Caucasus. J. Ethnobiol. Ethnomed. 12, 43.
Rexhepi, B., Mustafa, B., Hajdari, A., et al., 2013. Traditional medicinal plant
Ramirez, C.R., 2007. Ethnobotany and the loss of traditional knowledge in the 21st
PPG, I., 2016. A community-derived clas
Polat, R., Çak
Paksoy, M.Y., Selvi, S., Savran, A., 2016. Ethnopharmacological survey of medicinal
Mullalija, B., Mustafa, B., Hajdari, A., et al., 2021. Ethnobotany of rural and urban
Pieroni, A., 2017. Traditional uses of wild food plants, medicinal plants, and do-
Mittermeier, R., Gil, P., Hoffmann, M., et al., 2004. Hotspots Revisited: Earth’s Bio-
Myers, N., Mittermeier, R.A., Mittermeier, C.G., et al., 2000. Biodiversity hotspots for
Saraç, D.U., Sarg
Sa
€
sglu, M., Arslantürk, A., Akdemir, Z.K., et al., 2012. An ethnobotanical survey
€
sglu, K., et al., 2015. An ethnobotanical study on
Tabata, M., Aktan, S., 2014. Ethnobotanical survey of medicinal plants in Ulukula (Nigde-Turkey). J. Ethnopharmacol. 6, 42–48,
Palabaz Uzun, S., Koca, C. 2020. Ethnobotanical survey of medicinal plants traded in herbal markets of Karamanlar. Plant Divers. 42, 443–454,
Papp, N., Birkaš-Frendi, K., Farkas, A., et al., 2013. An ethnobotanical study on garden homes in a Transylvanian Hungarian Csángó village (Romania). Genet. Resour. Crop Evol. 60, 1423–1432,
Ozdemir, N., 2018. Gelekenelki bilgi ve kültür ekonomisi. Türk Dünyası Inc. Derg, 18, 1–28,
Ozhatay, N., Kültürlük, G., Erdal, B., 2019. Check-list of additional taxa to the sup-
Olczak, M., Arab, S., 2006. Ethnopharmacological survey of medicinal plants in Dzoogba (Mongolia). J. Ethnopharmacol. 100, 227–224,
Mittal, G., Sryamet, N., Pironi, A., et al., 2020. Knowledge transmission patterns at the border: ethnobotany of Hutsuls living in the Carpathian Mountains of Bucovina (SW Ukraine and NE Romania). J. Ethnobiol. Ethnomed. 16, 41,
Mehrmanshahi, M., Akbarinejad, M.S., et al., 2021. Ethnopharmacological studies of medicinal plants in central Zagros, Lorestan Province, Iran. J. Ethnopharmacol. 280, 114080,
Mi, T.A., Jan, M., Khare, R.K., 2021. Ethnomedicinal application of plants in Doodhghanga forest range of district Budgam, Jammu and Kashmir, India. Eur. J. Integr. Med. 46, 103166,
Mittermeier, R., Gil, P., Hoffmann, M., et al., 2004. Hotspots Revisited: Earth’s Bio-
Mittermeier, R., Pironi, A., 2019. Resilience in the mountains: biocultural refugia of wild food in the Greater Caucasus Range, Azerbaijan. Biodivers. Conserv. 28, 3529–3545,
Piketty, T., Civekle, Ş., Çakıcıoğlu, U., 2013. Traditional uses of some medicinal plants in Malatya (Turkey). J. Ethnopharmacol. 146, 331–346,
Tita, I., Mogosanu, G.D., Tita, M.C., 2009. Ethnobotanical inventory of medicinal plants from the South-West of Romania. Farmacia 57, 141–156,
Trotter, R.T., Logan, M.H., 1998. Cultural importance indices: a compara-
Trotter, R.T., Logan, M.H., 1998. Cultural importance indices: a compara-
Trotter, R.T., Logan, M.H., 1998. Cultural importance indices: a compara-
Trotter, R.T., Logan, M.H., 1998. Cultural importance indices: a compara-
Tabata, M., Eymaz, P.E., 2001. Turkish folk medicinal plants, part IV: Gönen (Balıkesir). Fitoterapia 72, 323–343,
Tabucu, M., Erol, E., 2001. Turkish folk medicinal plants, part III: Şile (İstanbul).
Tetik, F., Civekle, Ş., Çakıcıoğlu, U., 2013. Traditional uses of some medicinal plants in Malatya (Turkey). J. Ethnopharmacol. 146, 331–346,
Tita, I., Mogosanu, G.D., Tita, M.C., 2009. Ethnobotanical inventory of medicinal plants from the South-West of Romania. Farmacia 57, 141–156,
Trotter, R.T., Logan, M.H., 1986. Informant census: a new approach for identifying potentially effective medicinal plants. In: Etkin, L.N. (Ed.), Plants in Indigenous Medicine and Diet. Routledge, Bedford Hill, NY, pp. 91–112,
Tuzlacı, E., Ayaz, M.E., 2001. Turkish folk medicinal plants, part IV: Gönen (Balıkesir). Fitoterapia 72, 323–343,
Tuzlacı, E., Toton, E., 2000. Turkish folk medicinal plants, part III: Şile (İstanbul).
Tuzlacı, E., Erol, M.K., 1999. Turkish folk medicinal plants. Part II: Egridir (İsparta).
Tuzoterapia 70, 352–371,
Türkan, Ş., Malyer, H., 1986. Medical ethnobotany on the Javor (Kırklareli–Turkey). J. Ethnopharmacol. 139, 626–641,
PPL, I., 2016. A community-derived classification for extant lycophytes and ferns. J. Syst. Evol. 54, 563–603,
Rakovec, C.R., 2007. Ethnobotany and the loss of traditional knowledge in the 21st century. Ethnobot. Res. Appl. 5, 245–247,
Rekhepi, B., Mustafa, B., Hajdari, A., et al., 2013. Traditional medicinal plant
Rasul, S., Rahul, S., Joseph, G., et al., 2013. Studies on pharmaceutical ethnobotany in the high river ter valley (Pyrenees, Catalonia, ibarian peninsula). J. Ethnopharmacol. 131, 267–277,
Sagıroğlu, M., Arslan, E., Akdeniz, Z.K., et al., 2012. An ethnobotanical survey from Hayrat Trabzon and Kalkandere rize/Turkey. BioDiCon 5, 31–42,
Saraç, D.U., Özkan, Z.C., Akbulut, S., 2013. Ethnobotanic features of Rize/Turkey. Plant Divers. 6, 57–66,
Sargin, S.A., Büyükoğuz, S., 2019. Plants used in ethnopharmacological practices in Gulnar district of Mersin, Turkey. J. Ethnopharmacol. 174, 200–216,
Sargin, S.A., Selvi, S., Büyükoğuz, M., 2015. Ethnopharmacological plants of Aydıncık district of Mersin, Turkey. J. Ethnopharmacol. 174, 200–216,