Süleyman Demirel Üniversitesi
Fen Bilimleri Enstitüsü Dergisi
Cilt 23, Sayı 1, 90-107, 2019

Süleyman Demirel University
Journal of Natural and Applied Sciences
Volume 23, Issue 1, 90-107, 2019

DOI: 10.19113/sdufenbed.449607

A Research on Species Diversity and Ethno Botanical Utilization of *Lamiaceae* Family in Southern Turkey

İlker ÇİNBİLGEL*[1], Yusuf KURT[2]

[1]Akdeniz University, Manavgat Tourism Faculty, Tourism Guidance Department, 07600, Antalya
(ORCID: https://orcid.org/0000-0003-3084-5998)
[2] Harran University, Sciences and Arts Faculty, Molecular Biology and Genetics Department, 63300, Şanlıurfa
(ORCID: https://orcid.org/0000-0003-3550-1115)

(Alınış / Received: 31.07.2018, Kabul / Accepted: 15.02.2019, Online Yayınlanma / Published Online: 19.04.2019)

Keywords
Ethnobotany,
Lamiaceae,
Oregano,
Traditional knowledge,
Variation

Abstract: Lamiaceae/Labiatae family includes the highest number of commercially used species such as mint, rosemary, thyme, oregano, lavender, marjoram and sage. These species are generally used as flavoring additives in meat dishes, sausage products, seafood, stews, salads, canned foods, sauces and soups. In this study, the species diversity of Lamiaceae family members in Akseki-İbradı-Manavgat districts of Antalya in southern Turkey and their ethnobotanical utilization in the region and in the literatures were presented. 149 taxa (131 at species level) belonging to 27 genera of Lamiaceae were identified in the study area. Of these, 50 taxa (33.56%) are endemic to Turkey. The native people harvest species from wild populations and generally air-dry them under sun or on shadow places. They consume and sell mainly air-dried *Origanum onites* (Turkish oregano) leaves. They obtain essential oil traditionally by steam distillation from *Origanum majorana* (white marjoram) due to its high oil yield and efficiency. Herbal treatments are used for cure various diseases such as strong cough, chronic cold, wounds, gastrointestinal disorders and skin problems. Wild-crafting of populations may cause genetic erosion of the species. The sustainability of these species should be maintained by genetic resource conservation programs by *in situ* and *ex situ* conservation strategies.

Türkiye'nin Güneyinde *Lamiaceae* Ailesinin Tür Çeşitliliği ve Etnobotanik Kullanımı Üzerine Bir Araştırma

Anahtar Kelimeler
Etnobotanik,
Lamiaceae,
Kekik,
Geleneksel bilgi,
Varyasyon

Özet: Ballıbabagiller (Lamiaceae/Labiatae) ailesi nane, biberiye, kekik, mercanköşk, lavanta ve adaçayı gibi en fazla ticari olarak kullanılan türleri içerir. Bu türler genellikle et yemekleri, sucuk, deniz ürünleri, güveçler, salatalar, konserve yiyecekler, soslar ve çorbalarda lezzet verici olarak kullanılır. Bu çalışmada, Akseki-İbradı-Manavgat (Antalya) ilçelerinde yayılış gösteren Lamiaceae ailesine ait türlerin çeşitliliği ile bunların bölgedeki ve kaynaklardaki etnobotanik kullanımları sunulmuştur. Çalışma alanında, Lamiaceae'nin 27 cinsine ait 149 takson (131 tür) tespit edilmiştir. Bunlardan 50 takson (%33.56) Türkiye'ye özgü olan endemik bitkilerdir. Yöre halkı, kullanacakları türleri doğal popülasyonlardan toplayıp genellikle güneş altında veya gölge yerlerde kurutmaktadır. Yöre halkı, başlıca kuru *Origanum onites* (Türk Kekiği)'i tüketir ve satar. Yüksek yağ verimi ve etkinliği nedeniyle geleneksel olarak *Origanum majorana* (Akkekik)'dan damıtma ile yağ elde edilmektedir. Elde edilen bitkisel ürünler, yöre halkı tarafından şiddetli öksürük, kronik soğuk algınlığı, yaralar, mide-bağırsak bozuklukları ve cilt problemleri gibi çeşitli hastalıkların tedavisinde kullanılmaktadır. Bitki örneklerinin aşırı bir şekilde doğadan yabanıl populasyonlardan toplanması türlerin genetik erozyona uğramasına sebep olabilir. Doğal popülasyonların sürdürülebilirliğini sağlamak için, in situ ve ex situ koruma yöntemleri gibi farklı genetik kaynak koruma programları uygulanmalıdır.

*Corresponding author: icinbilgel@akdeniz.edu.tr

1. Introduction

Plant products have been used by human beings as a natural medicine against so many diseases and health problems since ancient times. Ethno botanical utilization of plants was learned by "trial and error" methods and experiences have been transferred orally among many generations until the present [1,2]. In other words, evolutionary ancestors of present medicines can be attributed back to ethno botanical usage experiences of plant products which are accumulated through millennia [3,4]. Ethno botanical usage of plants depend on so many factors such as plant diversity of region, the knowledge and geography of civilizations, cultural and economic status of people, and common diseases and/or health problems in a given time and region [4-6].

Turkey has a unique geographic position with diverse climate and three sides surrounded by seas at the center of the triangle of Asia, Europe and Africa continents. Country is at the intersection point of three biodiversity hotspots (Mediterranean Basin, the Caucasus and Irano-Anatolian) and three phytogeographical regions (Mediterranean, Irano-Turanian and Euro-Siberian). Also, Turkey is at the center of one of Vavilov`s center of diversity and center of agricultural development [7-9]. Turkey has almost 12.000 plant taxa of which about one third is endemic. The plant diversity of country is very close to whole Europe which is about 13.000 taxa [10-12]. This enormous species diversity of country can be resulted from the combination of geographic position, topography (from deep valleys to rocky mountains and from sea level to 5137 m), geology, vegetation from three different floristic regions and different climate types among regions [7,8]. Over many millennia, plant species of Turkey have been used and exploited by so many different civilizations from pre-history to the Republican period as an ethno medicine. One of the most famous and used family of ethno botanical plant is Lamiaceae which is formerly called Labiatae family [3,13,14].

The Lamiaceae (mint family) includes more than 240 genera, representing over 7000 species spread worldwide. The members of this family are mainly herbs or shrubs of various sizes, most of which are aromatic and commercially the most used species such as mint, rosemary, hyssop, thyme, lavender, perilla, basil, savory, sage and oregano [13,15,16]. These species are generally used as flavoring additives in meat dishes, sausage products, seafood, stews, salads, canned foods, sauces, appetizers and soups [13,17]. This family is characterized by frequently square stems, opposite or whorled (decussate) leaves and zygomorphic flowers usually with two-lipped corolla. This family is one of the most traditionally used and traded families in the world due to its aromatic quality [14].

In this study, we visited villages in southern Turkey and interviewed with native people to learn how they collect, process and utilize plant parts of Lamiaceae species from their natural habitats. Specific purposes of the study were to 1) evaluate the diversity of Lamiaceae species in the region, 2) report and evaluate various ethno botanical uses of the plant taxa by the local people, 3) compare and discuss the information gathered from native people and previous studies available in literature about usage of same and/or close species in Lamiaceae family.

2. Material and Method

2.1. Study area

The research area covers Akseki, İbradı and Manavgat districts of Antalya Province in Southern Turkey (Figure 1). The study area is located geographically in the C3 square according to the grid system in the "Flora of Turkey" [18-20].

The area includes plant communities in the Hot-Mediterranean, Eu-Mediterranean, Supra-Mediterranean, Mediterranean mountain and Mediterranean high mountain vegetation belts. Forest, maquis, dwarf-shrub and thorn-cushion, hydrophilic, snow-patch, moist meadow (meltwater) and doline, wind-exposed sloping hills, rock and scree vegetation types were distinguished in the field [21,22].

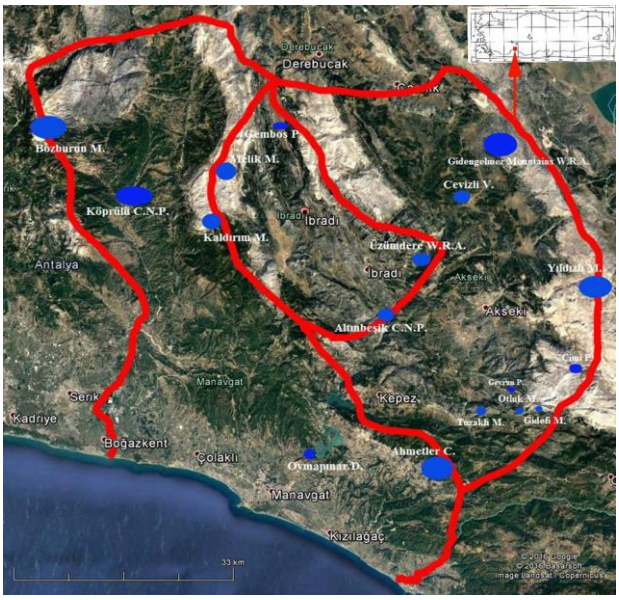

Figure 1. General location of the studied districts in southern Turkey

In the study area, main geological units the Anamas-Akseki Autochthon (Geyik Mountain Unit) with generally platform feature, belonging to the Taurus Carbonate Platform, Manavgat Miocene Basin, Antalya Nappes, Alanya Nappe, Beyşehir-Hoyran-Hadim Nappes, Quaternary Alluvium and slope debris were determined. Besides, units within area include marl, flysch, limestone, siltstone, conglomerate,

schist, sandstone, claystone, dolomite [23,24]. Gembos and Eynif Poljes, formed as a result of karstification at the beginning of the quaternary, are the most important poljes of the Western Taurus [23]. Especially, paleo-valleys are located in the research area as in Gidengelmez Mountains (Figure 1).

2.2. Plant materials

This research is based on extensive field studies performed between 2002 and 2016 data from the first author master (2002-2005) and doctorate thesis (2005-2012) [25-27], data from "Lichen mycota and Fern, Spermatophytic Flora of Ahmetler Canyon and surrounding area (Antalya) project" (2014-) [28] and related literature (See References section). Scientific plant names of species were identified by the first author of this paper mainly according to "Flora of Turkey and the East Aegean Islands" [10-12,29] and related resources (http://www.theplantlist.org/; http://ww2.bgbm.org/herbarium/default.cfm; http://www.ipni.org/).

We had interviews with native people in the study area to get information about ethnobotanical uses of various Lamiaceae species. During the interviews, we showed pictures and/or plant samples of the species concerned to avoid misunderstanding. After explaining the purpose of our study, we asked detailed questions about which Lamiaceae species they use, local names of these species, plant parts used, methods of preparation and source of their knowledge about species and traditional uses. We also visited local bazaars and tea houses to double-check information obtained from interviewees within and among local villages (See Appendix A. for detail questions).

2.2.1. Harvesting and drying process

Commercially important species of Lamiaceae are generally collected by native people in middle of June, as it was the case in 2016. The native people harvest whole plant and/or certain parts of a plant (such as flowers, fresh shoots and fruits) in naturally grown populations depending on collecting season, species and usage. The best harvest time to obtain high quality plant material is when the plants are at full blossoms or rarely following the flowering stage. The harvesting time of commercially used taxa starts mostly in late May and middle of June and lasts about one month, depending on various factors such as species, locality, altitude and precipitation in the harvest years. The plants are mostly harvested by women workers using gloves against any external damages (Figure 2). The collected plant materials are put in baskets and/or nylon sacks to transport to drying and/or storage area by collectors, donkeys/mules/horses and/or tractor trailer depending on the amount of harvest and field conditions. The main species commercially used in the study area are: *Origanum majorana* (oil oregano and/or white oregano), *O. onites* (Turkish oregano and/or black oregano), *O. minutiflorum*, *Thymbra spicata* and *Salvia tomentosa*.

Figure 2. Collection of *Origanum majorana*

The collected plants and/or plant parts are generally dispersed, in stacks not thicker than 15-30 cm in height, on a clean surface of flat house roof (Figure 3) or on nylon spread on a suitable plain ground. Air-drying process of plant material is generally carried out in shadow, usually beneath appropriate shading sheets and takes 5-15 days depending on so many different factors such as amount of plant material, drying field conditions and weather. Drying ground moisture should be very low (preferably less than 10 percent). During the drying process, the plant stack is mixed a few times by rake to accelerate drying and dried plant parts are beaten with a stick to separate leaves from braches and stems of Turkish oregano for giving to local dealers as marketable material (Figure 3).

Figure 3. Drying process of commercially collected *Origanum onites*

3. Results and Discussion

3.1. Diversity of Lamiaceae species in the study area

So far, 11707 plant taxa have been identified in Turkish Flora, 3649 (31.17%) of which are endemic

to Turkey. As to Lamiaceae family, there are 748 taxa, 326 (43.58%) of which are endemic to the country [12]. On the other hand, Lamiaceae family in the whole of Europea is represented by only 553 taxa (452 are in species level) within 41 genera [30]. Therefore, Turkey is regarded comparatively very rich in terms of both general plant diversity and diversity of Lamiaceae family [11,12]. The genera (and species within genera) of the study area are listed in alphabetical order in Appendix B. Plant`s Latin (scientific) name, Turkish and/or local name, plant parts used, traditional way of usage, purpose of traditional use and related references are also presented in Appendix B. We identified 149 taxa (131 at species level) belonging to 27 genera of Lamiaceae in the study area (Akseki-İbradı-Manavgat/Antalya) (Appendix B). Of these, 50 taxa (33.56%) are endemic to Turkey. 14 genera have 6 and more taxa, and 13 genera have 4 and less taxa (Appendix B and Figure 4). The most representative 7 genera have 83 taxa (56.7%) of the study area (Figure 4).

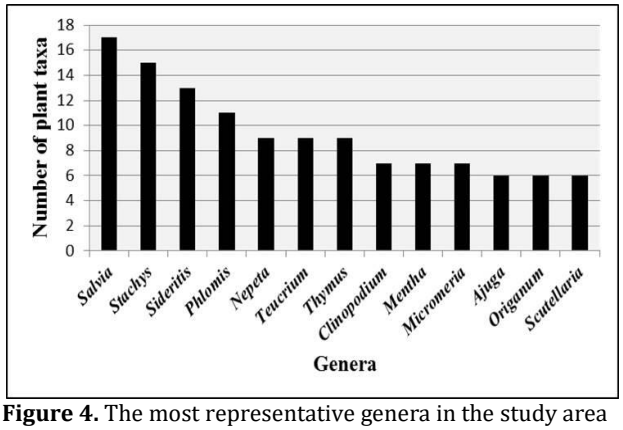

Figure 4. The most representative genera in the study area

Rich diversity of species and high endemism rate of plant families, including Lamiaceae taxa in the studied region have been reported in various studies (Table 1). Depending on the extent of the study area, number of taxa identified in the region ranged from 290 [48] to 1501 [22]. Similarly, endemism rate was also high, being between 11% and 20%. The number of taxa belonging to Lamiaceae ranged from 32 to 109. In addition to new records from Lamiaceae family, many other new species from different genera and families have been identified in recent years in the research region [49-62]. The high plant diversity and endemism rate of the study region within a limited area may be attributed to various factors such as its geographic position (being between Mediterranean and Irano-Turanian floristic regions), diverse topography (ranging from beaches to towering rocky mountains), geology and different climate types among districts (See Figure 1).

3.2. Lamiaceae species as a source of income

There are more than 60 species of Lamiaceae family collected and used as spice, condiment, extract

Table 1. Floristic studies related to research area

Number of taxa	Number of endemic and endemism rate (%)	Number of the Lamiaceae taxa, rate to total taxa (%)	References
1501	308 (20.52)	109 (7.26)	22
942	152 (16.1)	74 (7.86)	21, 27
605	69 (11.40)	42 (6.94)	25
290	60 (20.69)	37 (12.76)	48
957	164 (17.1)	84 (8.8)	36
1023	163 (16.9)	68 (6.65)	35
473	85 (18.0)	32 (6.8)	31

resource, animal and/or people food and herbal tea in the study area (Appendix B). But, only a few of them [i.e. *O. onites*, *O. majorana*, *Thymbra spicata*, *Salvia tomentosa* and *Salvia fruticosa*] are commercially harvested by the native people (Appendix B). A family in a village (with four or five persons, above age 15) can roughly collect 500-1000 kg fresh commercially used plant material during an abundant season. After air-drying process, about 10-15% of fresh plant materials are obtained as commercial dried material. The native people receives about 1.0 or 2.0 $ for 1 kg of air-dried Turkish oregano from local dealers. In some areas, income from *Satureja* spp. may be higher than the amount of income from Turkish oregano per family in the study area [63]. Although it is a small amount of income for a family, it is very valuable for unemployed housewives and teenagers.

Depending on distribution of plant species, culture and knowledge of the native people, there are so many different plant taxa used as essential oil resources in Turkey [13,40,63] and in the study region (Appendix B). The native people extract oil and oily water mainly from *Origanum majorana* in the study region. They obtain oil by traditional distillation method which is known as alembic distillation system (Figure 5). They sell one liter of bottled oily water about 1 $ in local street markets [64]. They do not sell pure oil which is obtained about 200 ml from 15-20 kg dried plant materials. The native people only use pure oil as a folk medicine against so many health problems of people and domestic animals [3,65,66].

Figure 5. General view of traditional oil extraction

3.3. Ethnobotanical utilization of Lamiaceae species

The native people generally use fresh shoots and aerial parts of plant such as leaves, flowers and fruits for seasonal use (Appendix B). They prepare plant materials in so many different methods such as infusion, decoction, getting extract and oil depending on cured problems, knowledge and used species. The native people mix oil with one or more of the other plant oils [such as olive oil (*Olea europaea*), laurel oil (*Laurus nobilis*) and "puse" (wood extract of *Pinus brutia*) all three plants being native to the region] to reduce its burning effect and increase healing efficiency of marjoram oil [67].The native people generally use plant materials against cough, stomachache, abdominal pain, headache, wounds, skin problems, intestinal disorders, cold and flu [2,3,13,22,32,39]. One of the most common and simple way of utilization is to use plant materials as a relaxing tea (Appendix B).

The native people consume more than 50 Lamiaceae species as herbal tea (Appendix B). They prefer to put plant parts (generally small branches with leaves) in hot water, unlike to boil plant parts in Spanish consumption [68]. They believe that boiling kills natural healing effects of plant. Beside the uses as tea, dried Lamiaceae species are mostly used as spice and condiment in almost all food dishes such as soups, meat dishes (especially red meat and fish) and salads (generally fresh plant material) in the study area as well as in Turkey [2]. The native people consume olives and olive oils with dry oregano (`kekik` in Turkish) as a traditional side dish, especially during breakfast. They do not harvest certain Lamiaceae species (especially those of genus *Thymus*) from high plateau and let them used by honey bees. Honey from *Thymus* spp. is known as "kekik honey" and it has a more pungent flavor and taste than regular flower honey.

4. Conclusion

The results of this study indicated that the study area has very rich plant taxa diversity of Lamiaceae family (149 taxa from 27 genera). Also, traditional and ethno botanical utilization of plant taxa were reported by this study. The most commonly representative plant genera were *Salvia*, *Stachys, Sideritis*, and *Phlomis*. The most commonly used plant parts were aerial parts such as leaves, flowers and fruits. The native people having been used plant taxa as an ethno medicine against so many diseases and health problems. The flora of study region is threatened by so many factors such as overexploitation, collection of plant material before seed formation, expansion of agricultural lands, housing developments and industrial activities. Conservation efforts (*In situ* and *ex situ* conservation) and public education (especially for the native people of region) have the vital role for sustainable management of natural resources in the study region.

Acknowledgement

The study in this research partly supported by "Lichen mycota and Fern, Spermatophytic Flora of Ahmetler Canyon and surrounding area (Antalya) project" (Project number: FBA-2014-88). We would like to thank the supports of Akdeniz University Management Unit of Scientific Research Projects. The authors thank to rural people in various villages on the Taurus Mountains of Akseki-İbradı-Manavgat districts (Antalya/Turkey). They kindly shared with us the folkloric information they have about ethnobotanical utilization of Lamiaceae species and their products. We would like to thank Dr. Kani ISIK (Emeritus professor, Biology Department, Akdeniz University) for his valuable review both scientifically and linguistically on the manuscript. We would also like to thank the anonymous reviewer(s) and editor for their valuable comments on the manuscript.

References

[1] Camejo-Rodrigues, J., Ascensao, L., Bonet, M. A., & Valles, J. 2003. An ethnobotanical study of medicinal and aromatic plants in the Natural park of "Serra de Sao Mamede" (Portugal), *J Ethnopharmacol*, 89 (2003) 199-209.

[2] Akbulut, S., Bayramoglu, M. M. 2013. The trade and use of some medical and aromatic herbs in Turkey, *Ethno Med*, 7 (2) (2013) 67-77.

[3] Baytop, T. 1999. *Therapy with medicinal plants in Turkey (Past and Present)*, Publications of the Istanbul University (In Turkish), No: 3255 (second edition), Istanbul, Turkey, 480 p.

[4] Fabricant, D. S., Famsworth, N. R. 2001. The value of plants used in traditional medicine for drug discovery, *Environ. Health Perps*, 109 (1) (2001) 69-75.

[5] Johnson, M. L. 2006. Gitkson medicinal plants-cultural choice and efficacy, *J Ethnobiol Ethnomed*, 2 (2006) 29.

[6] Ari, S., Temel, M., Kargioglu, M., Konuk, M. 2015. Ethnobotanical survey of plants used in Afyonkarahisar-Turkey, *J Ethnobiol Ethnomed*, 11 (2015) 84.

[7] Kaya, Z., Raynal, D. J. 2001. Biodiversity and conservation of Turkish forests, *Biol Conserv*, 97 (2001) 131-141.

[8] Sekercioglu, C. H., Anderson, S., Akcay, E., Bilgin, R., Can, O. E. & *et al*. 2011. Turkey`s globally important biodiversity in crisis, *Biol Conserv*, 144 (2011) 2752-2769.

[9] Hammer, K. E., Hancock, J. F. 2015. Vavilovian centers of plant diversity: Implications and impacts, *HortScience,* 50 (6) (2015) 780-783.

[10] Davis, P. H. (ed.). 1965-1985. *Flora of Turkey and the East Aegean Islands*, vols. 1-9, (Edinburgh University Press, Edinburgh).

[11] Guner, A., Ozhatay, N., Ekim, T., Baser, K. H. C. (eds.) 2000. *Flora of Turkey and the East Aegean Islands. Vol: 11*, (Edinburgh Univ. Pres., Edinburgh).

[12] Guner, A., Aslan, S., Ekim, T., Vural, M., Babac, M. T. 2012. *A Check List of the Flora of Turkey (Vascular Plants)*, Nezahat Gökyiğit Botanik Bahçesi ve Flora Araştırmaları Derneği Yayını, İstanbul, (In Turkish).

[13] Koyuncu, O., Yaylaci, O. K., Ozturk, D., Erkara, I. P., Savaroglu, F. & *et al*. 2010. Risk categories and ethnobotanical features of the Lamiaceae taxa growing naturally in Osmaneli (Bilecik/Turkey) and environs, *Biodivers Conserv*, 3 (3) (2010) 31-45.

[14] Raja, R. R. 2012. Medicinally potential plants of Labiatae (Lamiaceae) family: an overview, *RJMP*, (2012), doi: 10.3923/rjmp.2012.

[15] Brauchler, C., Meimberg, H., Heubl, G. 2010. Molecular phylogeny of Menthinae (Lamiaceae, Nepetoideae, Mentheae) – Taxonomy, biogeography and conflicts, *Mol Phylogenet Evol*, 55 (2010) 501-523.

[16] Theodoridis, S., Stefanaki, A., Tezcan, M., Aki, C., Kokkini, S. & *et al*. 2012. DNA barcoding in native plants of the Labiatae (Lamiaceae) family from Chios Island (Greece) and the adjacent Çeşme-Karaburun Peninsula (Turkey), *Mol Ecol Resour*, 12 (2012) 620-633.

[17] Skoula, M., Harborne, J. B. 2002. The taxonomy and chemistry of *Origanum*. In: Oregano: *The genera Origanum and Lippia*, edited by SE Kintzios, (Taylor and Francis, London and New York).

[18] Donner, J. 1990. Distribution Maps to P.H.Davis, "Flora of Turkey, 1-10", *Linzer Biol Beitr*, 22 (2) (1990) 381-515.

[19] Donner, J. 2007. *Türkiye Bitkileri Yayılış Haritaları*, edited by HA Colak, (Lazer Ofset Matbaa, Istanbul), (In Turkish).

[20] Kutluk, H., Aytug, B. 2004. *Plants of Turkey Grid by Grid*, (Birlik Ofset Yayıncılık, Eskişehir).

[21] Cinbilgel, I., Gokceoglu, M. 2013. Studies on Flora of Melik and Kaldırım Mountains and the Surrounding Area (Manavgat-İbradı/Antalya), In: *7th International Symposium on Ecology and Environmental Problems* (ISEEP 2013), 18-21 December, Antalya, Turkey.

[22] Cinbilgel, I., Ozcelik, H. 2015. Bir Bitki Cenneti ya da Akseki, In*: Ben Akseki'yim,* edited by K Demirtas, C Guzelyurek & U Durak, [Elit Ofset Matbaacılık, İstanbul, [ISBN: 978-975-92752-1-1], 110-132, (In Turkish).

[23] Dogan, U. 2002. Geomorphological evolution of the Manavgat River's basin, *GUJGEF*, *22* (2) (2002) 51-65.

[24] Lukeneder, S., Lukeneder, A. 2014. A new ammonoid fauna from the Carnian (Upper Triassic) Kasımlar formation of the Taurus Mountains (Anatolia, Turkey), *Palaeontology*, 57 (2) (2014) 357-396.

[25] Cinbilgel, I., Gokceoglu, M. 2010a. Flora of Altınbeşik Cavern National Park (İbradı-Akseki, Antalya/Turkey), *Biodivers Conserv*, 3 (3) (2010a) 85-110.

[26] Cinbilgel, I., Gokceoglu, M. 2010b. The Vegetation of Altınbeşik Cavern National Park (İbradı-Akseki/Antalya-Turkey) A Synecological Study, *SJRD* 1 (2) (2010b) 1-17.

[27] Cinbilgel, I. 2012. *Studies on Flora and Vegetation of Melik and Kaldırım Mountains and Surrounding Area (Manavgat – İbradı / Antalya)*, PhD Thesis, (Antalya: Akdeniz University, Science Institute) (In Turkish with English abstract).

[28] Çinbilgel, I. Tufan Çetin, Ö. 2018. *Ahmetler Kanyonu ve Çevresinin Liken Mikotası ile Eğrelti ve Tohumlu Bitki Florası (Antalya)*, Akdeniz Universitesi Bilimsel Araştırma Projeleri Koordinasyon Birimi, Araştırma Projesi, Proje No: FBA-2014-88, 2014-continue, (In Turkish).

[29] Davis, P. H., Mill, R. R., Tan, K. 1988. *Flora of Turkey and the East Aegean Islands*, vol. 10, (Edinburgh University Press, Edinburgh).

[30] Tutin, T. G., Heywood, V. H., Burges, N. A., Moore, D. M.,Valentine, D. H., & *et al*. 1972.Flora Europaea."Diapensiaceae to Myoporaceae",Vol3.

[31] Dural, H., Kucukoduk, M., Ertugrul, K. 1995. Contributions to the Flora of Yıldızlı Dağı (Akseki-Antalya), *OT*, 2 (2) (1995) 47-66, (In Turkish with English abstract).

[32] Bulut, Y. 2006. *Useful Plants of Manavgat District (Antalya)*, (Master Thesis, Suleyman Demirel University, Science Institute. 106 p. Isparta, Turkey), (In Turkish with English abstract).

[33] Altundag, E., Ozturk, M. 2011. Ethnomedicinal studies on the plant resources of east Anatolia, Turkey, *Procedia Soc Behav Sci*, 19 (2011) 756-777.

[34] Yesilyurt, E. M., Simsek, I., Akaydın, G., Yesilada, E. 2017. An ethnobotanical survey in selected districts of the Black Sea region (Turkey), *Turk J Bot*, 41 (2017), 47-62.

[35] Duran, A. 2002. Flora of Tuzaklı, Otluk, Gidefi Mountains and Surroundings (Akseki), *Turk J Bot*, 26 (2002) 303-349.

[36] Demirelma, H. 2006. *The Flora of the Region between Derebucak (Konya)–İbradı and Cevizli (Antalya)*, PhD Thesis, (Selçuk University, Graduate School of Natural and Applied Sciences, Department of Biology, Konya, Turkey) (In Turkish with English abstract).

[37] Yesilada, E., Honda, G., Sezik, E., Tabata, M., Goto, K., & *et al*. 1993. Traditional medicine in Turkey. IV. Folk medicine in the Mediterranean subdivision, *J Ethnopharmacol*, 39 (1993) 31-38.

[38] Davis, P. H. (ed). 1982. *Flora of Turkey and the East Aegean Islands*, vol. 7, (Edinburgh University Press, Edinburgh).

[39] Duran, A. 1998. Local names and ethnobotanical features of some plants in the district of Akseki (province of Antalya), *OT*, 5 (1) (1998) 77-92, (In Turkish with English abstract).

[40] Gurdal, B., Kultur, S. 2013. An ethnobotanical study of medicinal plants in Marmaris (Mugla, Turkey), *J Ethnopharmacol*, 146 (2013) 113-126.

[41] Honda, G., Yesilada, E., Tabata, M., Sezik, E., Fujita, T., Takeda, Y., & *et al*.1996. Traditional medicine in Turkey VI. Folk medicine in West Anatolia: Afyon, Kütahya, Denizli, Muğla, Aydın provinces, *J Ethnopharmacol*, 53 (1996) 75-87.

[42] Tugay, O., Bagci, I., Ulukus, D., Ozer, E., Canbulat, M. A. 2012. Wild plants using as food of Kurucuova Town (Beysehir, Konya/Turkey), *Biodivers Conserv*, 5 (2012) 140-145.

[43] Cakilcioglu, U., Khatun, S., Turkoglu, I., Hayta, S. 2011. Ethnopharmacological survey of medicinal plants in Maden (Elazig-Turkey), *J Ethnopharmacol*, 137 (2011) 469-486.

[44] Polat, R., Satil, F. 2012. An ethnobotanical survey of medicinal plants in Edremit Gulf (Balikesir-Turkey), *J Ethnopharmacol*, 139 (2012) 626-641.

[45] Yesilada, E., Honda, G., Sezik, E., Tabata, M., Fujita, T., & *et al*., 1995. Traditional medicine in Turkey. V. Folk medicine in the inner Taurus Mountains, *J Ethnopharmacol*, 46 (1995) 133-152.

[46] Sezik, E., Yesilada, E., Honda, G., Takaishi, Y., Takeda, Y., & *et al*. 2001. Traditional medicine in Turkey X. Folk medicine in Central Anatolia, *J Ethnopharmacol*, 75 (2001), 95-115.

[47] Baser, K. H. C., Sezik, E., Tumen, G. 1991. Composition of the essential oils of *Ziziphora clinopodioides* Lam, *J Essent Oil Res*, 3 (1991) 237-239.

[48] Kacar, M. S., Gokturk, R. S., Sert, H., Burkay, S., Karacan, V. A. 2008. *Üzümdere Yaban Hayatı Geliştirme Sahası Hızlı Alan Değerlendirmesi*, Doğa Koruma ve Milli Parklar Genel Müdürlüğü, Antalya İl Çevre ve Orman Müdürlüğü, Antalya, (In Turkish).

[49] Duran, A. 1999. *Astragalus antalyensis* A.Duran & Podlech, *Astragalus cedreticola* A. Duran & Podlech., *Sendtnera*, 6 (1999) 135-174.

[50] Duran, A., Duman, H. 1999. Two new Species of Umbelliferae from Southern Turkey, *Edinb. J Bot*, 56 (1) (1999) 47-53.

[51] Duran, A., Duman, H. 2002. Two new species of *Centaurea* (Asteraceae) from Turkey, *Ann Bot Fenn*, 39 (2002) 43-48.

[52] Duman, H., Duran, A. 2001. A new species of *Arabis* L. (Brassicaceae) from South Anatolia, *Isr J Plant Sci*, 49 (2001) 237-240.

[53] Duran, A., Menemen, Y. 2002. *Linaria dumanii* (Scrophulariaceae), a new species from South Anatolia, Turkey, *Ann Bot Fenn*, 39 (2002) 85-87.

[54] Parolly, G., Nordt, B. 2002. A new chasmophytic species of *Potentilla* (Rosaceae) from S Anatolia, including some taxonomic remarks on *P*. subg. *fragariastrum* in the E Mediterranean, *Willdenowia*, 32 (2002) 73-84.

[55] Parolly, G., Nordt, B. 2004. *Peucedanum isauricum* (Apiaceae), a striking new species from south Anatolia, with notes on the related *P. graminifolium* and *P. spreitzenhoferi*. *Willdenowia*, 34 (2004) 135–144.

[56] Aytac, Z., Duman, H. 2004. Six new taxa (Caryophyllaceae) from Turkey. In: Finnish Zoological and Botanical Publishing Board, *Ann Bot Fenn*, (2004) 213-221.

[57] Sagiroglu, M., Duman, H. 2010. *Ferula brevipedicellata* and *F. duranii* (Apiaceae), Two New Species from Anatolia, Turkey. *Ann Bot Fenn*, 47 (4) (2010) 293-300.

[58] Duran, A., Dogan, B., Ay, H. 2011. *Bilacunaria aksekiensis* (Apiaceae), a new species form South Anatolia, Turkey, *Ann Bot Fenn*, 48 (2011) 361-367.

[59] Duran, A., Ozturk, M., Cetin, O. 2013. *Scorzonera aksekiensis* sp. nov. (Asteraceae) from south Anatolia, Turkey, *Nord J Bot*, 31(2013) 1-7.

[60] Cinbilgel, I., Eren, O., Duman, H. 2014. *Rhaponticoides gokceoglui* (Asteraceae), a striking new species from Turkey, *Phytotaxa*, 170 (2) (2014) 125-132.

[61] Cinbilgel, I., Eren, O., Duman, H., Gokceoglu, M. 2015. *Pimpinella ibradiensis* (Apiaceae), an unusual new species from Turkey. *Phytotaxa*, 217 (2) (2015) 164-172.

[62] Dirmenci, T., Yazici, T., Ozcan, T., Celenk, S., Martin, E. 2017. A new species and a new natural hybrid of *Origanum* L. (Lamiaceae) from the west of Turkey, *Turk J Bot*, 41 (2017), doi: 10.3906/bot-1704-35.

[63] Satil, F., Dirmenci, T., Tumen, G., Turan, Y. 2008. Commercial and ethnic uses of *Satureja* (Sivri kekik) species in Turkey, *Ekoloji*, 17 (67) (2008) 1-7.

[64] Aydin, S., Baser, K. H. C., Ozturk, Y. 1996. The chemistry and pharmacology of *Origanum* (Kekik) water, In: Franz, C. H., Mathe, A., Buchbauer, G. (eds.), *Proceedings of the 27th International Symposium on Essential Oils, Essential Oils: Basic and Applied Research*, Vienna, Austria, 8-11 September 1996, pp. 52-60.

[65] Chishti, S., Kaloo, Z. A., Sultan, P. 2013. Medicinal importance of genus *Origanum*: a review, *J Pharmacognosy Phytother*, 5 (10) (2013) 170-177.

[66] Prerna, N., Vasudeva, N. 2015. *Origanum majorana* L. –Phyto-pharmacological review, *Indian J Nat Prod Resour*, 6 (4) (2015) 261-267.

[67] Suntar, I., Akkol, E. K., Keles, H., Oktem, A., Baser, K. H. C, & *et al*. 2011. A novel wound healing ointment: A formulation of *Hypericum perforatum* oil and sage and oregano essential oils based on traditional Turkish knowledge, *J Ethnopharmacol*, 134 (2011) 89-96.

[68] De Santayana, M. P., Blanco, E., Morales, R. 2005. Plants known as te in Spain: An ethno-pharmaco-botanical review, *J Ethnopharmacol,* 98 (2005) 1-19.

Appendices

Appendix A. After learning personal information of participants (full name, age, sex, address, educational level and etc.), we asked below questions about study.

1) What is the local name of plant taxa?
2) When do you collect the plant taxa?
3) Which parts of the plant taxa do you collect and use?
4) How do you prepare the plant material for use?
5) Against which kind of problems do you use the plant taxa?
6) How do you apply the plant taxa?
7) How much do you use against problems?
8) How do you know appropriate dose?
9) How long do you apply cure?
10) Do you know or have you seen any side effects of the plant taxa?
11) How long do you store the plant material?
12) How did you learn to use the plant taxa as an ethno medicine?

Appendix B. Lamiaceae taxa of study area and their local name, status, used parts and traditional utilization

Appendix B. Lamiaceae taxa of study area and their local name, status, used parts and traditional utilization

Genus (Turkish names of genus)	No	Scientific name/ Collector name and number	Local and/or commercial names of taxon	Status	Part(s) used and usage as	Treated disorder(s)	References
AJUGA L. (Mayasılotu, Yer çamı)	1	*A. bombycina* Boiss. (Çinbilgel 8608)	Geyik mayasılı	End.			22, 27, 31,32
	2	*A. chamaepitys* (L.) Schreb. subsp. *chia*(Schreb.) Arcang. (Çinbilgel 8619)	Tosbağa tırnağı, Mayasıl otu, Bodur ot, Bozca ot, Kokar ot, Acı gıcı		Aerial parts, Tea	Antihemorrhoidal, diuretic, tonic, vulnerary and skin problems	13, 25, 33, 34
	3	*A. chamaepitys* (L.) Schreb. subsp. *cuneatifolia* (Stapf) P.H.Davis (Çinbilgel 8923)	Tosbağa tırnağı, Tosbağa çiçeği, Kaya mayasılı		Aerial parts, Tea	Reduce fewer and cough, diuretic, kidney stones, menstrual problems	25, 27, 32
	4	*A. chamaepitys* (L.) Schreb. subsp. *glareosa* P.H.Davis (A.Duran 2856)	Çakıl mayasılı				22, 32, 35
	5	*A. chamaepitys* (L.) Schreb. subsp. *mesogitana* (Boiss.) Bornm. (Çinbilgel 10332)	Tosbağa tırnağı, Tosbağa çiçeği, Bayır mayasılı				25, 32
	6	*A. chamaepitys* (L.) Schreb. subsp. *palaestina* (Boiss.) Bornm.	Tosbağa tırnağı, Tosbağa çiçeği, Dallı				22, 27, 32

		(Çinbilgel 4908)	mayasıl				
BALLOTA L. (Bozot)	7	*B. cristata* P.H.Davis (Çinbilgel 4984)	Bozot, Tahtalı nemnem	End.			27, 32, 36
	8	*B. inaequidens* Hub.-Mor. & Patzak (Çinbilgel 9455)	Bozot, Koç nemnemi	End.			22, 28, 35
	9	*B. latibracteolata* P.H.Davis & Doroszenko (Çinbilgel 9473)	Bozot, Kaba nemnem	End.			22, 25, 28
	10	*B. nigra* L. subsp. *anatolica* P.H.Davis (Özçelik 11191)	Köpek otu, Ballık otu, Leylimkara, Gırip otu		Aerial parts, Tea	Asthma, antiseptic, cold and flu	13, 32, 37
CLINOPODIUM L. (Yabani fesleğen)	11	*C. graveolens* subsp. *rotundifolium* (Pers.) Govaerts (Çinbilgel 8809)	Filiskin				22, 25, 27, 38
	12	*C. nepeta* (L.) Kuntze subsp. *glandulosum*(Req.) Govaerts (Özçelik 12118)	Sümüklü fesleğen				32
	13	*C. nepeta* (L.) Kuntze subsp. *nepeta* (Çinbilgel 10216)	Dağ narpuzu, Kedi fesleğeni		Leaves and flowering branches, Tea	Relaxing tea	28, 32
	14	*C. pamphylicum* (Boiss. & Heldr.) Govaerts subsp.alanyense (Alan&Ocak) Alan & Dirmenci (Çinbilgel 10386)	Kaya nanesi, Alanya Fesleğeni	End.	Leaves and flowering branches, Tea, in foods as spice	Relaxing tea	28
	15	*C. pamphylicum* (Boiss. & Heldr.) Govaerts subsp. *pamphylicum* (A.Duran 4157)	Yarık fesleğeni	End.			22, 35
	16	*C. vulgare* L. subsp. *vulgare* (Çinbilgel 10078)	Yabani fesleğen		Leaves and flowering branches, Tea, Spice	Cold, Relaxing tea	25, 27, 32, 36
	17	*C. vulgare* L. subsp. *arundanum* (Boiss.) Nyman (Çinbilgel 9353)	Kamış fesleğen		Leaves and flowering branches, Spice	Cold, Relaxing tea	13, 22, 25, 28
CYCLOTRICHIUM (Boiss.) Manden. & Scheng. (Dağnanesi)	18	*C. origanifolium* (Labill.) Manden. & Scheng. (H. Demirelma 2487)	Su nanesi, Dağ nanesi		Leaves and flowering branches, Tea	Stomachache	22, 35, 36, 39
LALLEMANTIA Fisch. & C.A.Mey. (Ajdarbaşı)	19	*L. iberica* (M.Bieb) Fisch. & C.A.Mey. (H. Demirelma 1644)	Ajdarbaşı				22, 31, 36
LAMIUM L. (Ballıbaba)	20	*L. amplexicaule* L. var. *amplexicaule* (Çinbilgel 8568)	Baltutan, Ballıbaba		Aerial parts, Tea	Prostate	13, 25, 27, 36

	21	*L. eriocephalum* Benth. (Çinbilgel 3313)	Al balıcak	End.			22, 27, 35
	22	*L. garganicum* L. subsp. *striatum* (Sm.) Hayek var. *striatum* (Çinbilgel 8800)	Ballık, tel balıcak		Flowering branches and nectar	Sucking sweet nectar	25, 27, 39
	23	*L. macrodon* Boiss. & Huet (Çinbilgel 3536)	Balbaşı				22, 27, 36, 38
LAVANDULA L. (Lavanta)	24	*L. stoechas* L. subsp. *stoechas* (observ.)	Karabaş otu, Karahan		Leaves and fresh shoots, Tea and oil	Cardiovascular diseases, cholesterol, stomachache, infections, painkiller and against insects	32, 40
MARRUBIUM L. (Bozot)	25	*M. astracanicum* Jacq. subsp. *macrodon* (Bornm.) P.H.Davis (Çinbilgel 4488)	Bozot, Koca yayotu	End.			27
	26	*M. globosum* Montbret & Aucher ex Benth. subsp. *globosum* (Çinbilgel 3976)	Bozot, Bozcaboğum	End.			22, 27, 35
	27	*M. globosum* Montbret & Aucher ex Benth. subsp. *micranthum* (Boiss. & Heldr.) P.H.Davis (Çinbilgel 4229)	Bozot	End.			22, 27, 31
	28	*M. vulgare* L. (Çinbilgel 9712)	Bozot, Yay otu, Kara derme		Aerial parts, Tea and Extracts	Diuretic and Antisticking for knitting wool	13, 25, 38, 39
MELISSA L. (Oğul otu)	29	*M. officinalis* L. subsp. *officinalis* (Çinbilgel 9449)	Oğul otu, Melisa, Kolonya otu, Limon otu		Leaves and fresh shoots, Tea	Stomachache,intestinal problems, diarrhea, asthma, headache and migraine, Relaxing tea	25, 27, 32, 33
MENTHA L. (Nane)	30	*M. aquatica* L. (Çinbilgel 7463)	Dere nanesi, Su nanesi, Su yarpuzu				27
	31	*M. longifolia* (L.) L. subsp. *thyphoides* (Briq.) Harley (Çinbilgel 4888)	Yarpuz, Narpuz, Nane otu, Dere nanesi		Leaves, Tea	Throat pain, abdominal pain, carminative, intestinal disorders	25, 27, 33, 41
	32	*M. longifolia* (L.) L. subsp. longifolia (Bulut 161)	Yarpız, Pünk		Aerial parts	Animal food, Herb/Colds, flu, cough, catarrh, diseaes, abdominal pain, menstrual pain, stomachic, bronchitis, headache, pulmonic disorders, diarrhoea, asthma, antihemorrhoidal, Leaf/Sunstroke, aphta	32, 33, 39
	33	*M. x piperita* L. (Çinbilgel 5710)	Nane, Bahçe nanesi		Leaves, Tea and spice	Appetizing, cold, flu, cough, catarrh, abdominal pain, headache	25, 27, 34, 36
	34	*M. pulegium* L.	Yarpuz, Nane		Aerial	Vulnerary, cold and gall	28, 33, 40

		(Çinbilgel 10381)			parts, Tea and oil	bladder	
	35	*M. spicata* L. subsp. *condensata* (Briq.) Greuter & Burdet (Çinbilgel 4525)	Yarpuz, Kıvırcık nane, Narpuz, Su nanesi		Leaves and stems, In foods (especially in rice) Tea with Lemon	Appetizing and food, Stomachache, cold and anti-vomit	27, 32, 36, 42
	36	*M. spicata* L. subsp. *spicata* (Çinbilgel 9988)	Eşek nanesi Yarpuz, Narpuz, Pünk, Pune		Aerial parts, Tea	Antirheumatic, stomachic, diarrhea, colds and flu	27, 33, 42, 43
MICROMERIA Benth. (Boğumlu çay, Topuk çayı, Taş nanesi, Viks çiçeği)	37	*M. cremnophila* Boiss. & Heldr. subsp. *amana* (Rech.f.) P.H.Davis (Çinbilgel 2388)	Bodur boğumcuk				25
	38	*M. cristata* (Hampe) Griseb. subsp. *xylorrhiza* (Boiss. & Heldr. ex Benth.) P.H.Davis (Özçelik 10384)	Kertiş kuyruğu	End.			32
	39	*M. elliptica* K. Koch (Özçelik 11598)	Kaya yarpuzu				32
	40	*M. graeca* (L.) Benth. ex Reichb. subsp. *graeca* (Çinbilgel 9728)	Boğumcuk				25, 27, 32, 36
	41	*M. juliana* (L.) Benth. ex Rchb. (Özçelik 10510)	Topuk çayı				32
	42	*M. myrtifolia* Boiss. & Hohen. (Çinbilgel 9346)	Güvercin otu, Boğumlu çay, Dağ çayı		Leaves and flowering branches, Tea	Respiratory diseases, cold and flu	13, 25, 32, 44
	43	*M. nervosa (Desf.) Benth.* (Özçelik 10345)	Kıllı topuk				32
NEPETA L. (Kedi nanesi, Pisik otu, Eşek çayı, Boz ot)	44	*N. cadmea* Boiss. (Çinbilgel 7095)	Honaz pisik otu	End.			22, 27, 35, 36
	45	*N. cilicia* Boiss. ex Benth. (Çinbilgel 6682)	Gök pisikotu				22, 27, 31, 36
	46	*N. concolor* Boiss. & Heldr. ex Benth. (A.Duran 3147)	Geyik pisik otu	End.			22, 35
	47	*N. flavida* Hub.-Mor. (Özçelik 10442)	Püskuyruğu				32
	48	*N. isaurica* Boiss. & Heldr. ex Benth. (A.Duran 2494)	Kırk pisik otu	End.			22, 35
	49	*N. italica* L. (Çinbilgel 10021)	Ada çayı, Eşek çayı, Boğmaca otu		Aerial parts, Tea	Tonic and bronchitis	25, 27, 45
	50	*N. nuda* L. subsp. *albiflora* (Boiss.) Gams (Çinbilgel 9447)	Kedi otu, Karaküncü				22, 27, 35

	51	*N. phyllochlamys* P.H.Davis (A.Duran 3169)	Kaya pisik otu	End.			22, 35
	52	*N. sulfuriflora* P.H.Davis (Özçelik 10421)	Sarı pisik otu	End.			32
OCIMUM L. (Fesleğen)	53	*O. basilicum* L. (observ.)	Fesleğen, Feslikan Festiken, Reyhan		Leaves and Fresh shoots, Tea and spice	Cough, cold, flu and mouth wounds	22, 32, 39, 44
ORIGANUM L. (Mercanköşk, Kekik)	54	*O. bilgeri* P.H.Davis (Çinbilgel 7229)	Kekik, Tüylü mercan	End.			22, 27, 35, 36
	55	*O. majorana* L. (Çinbilgel 9345)	Yağ kekiği, Ak kekik, Kekik çay, Mercan köşk		Aerial parts, Tea, water and oil	Stomachache, cold, wounds, sedative, diaphoretic and skin problems, against ectoparasites on animals as bees, sheep	25, 32, 33, 45
	56	*O. minutiflorum* O.Schwarz & P.H.Davis (Çinbilgel 2976)	Kekik, Toka kekik, Sütçüler kekiği	End.	Aerial parts, Tea	Cold and stomachache	27, 32, 37
	57	*O. onites* L. (Çinbilgel 9310)	Eşekkekiği, Bilyalı kekik, Güve kekiği, Karakekik		Leaves, flowering branches and fresh shoots, Tea, water, oil and spice	Reduce cholesterol, vasodilating, cold, cough, diabetes, burn and insecticidal	22, 31, 32, 40
	58	*O. saccatum* P.H.Davis (Çinbilgel 9586)	Bayır çayı, Çay otu	End.	Leaves and flowering branches, Tea	Relaxing tea, stomachache	25, 27, 39, 41
	59	*O. sipyleum* L. (observ.)	Mor mercan	End.	Leaves and flowering branches, Tea and spice	Hemorrhoid and diabetes	13, 32
PHLOMIS L. (Çalba, Çobançırası, Karağan otu, Ayı kulağı, Ballık otu)	60	*P. armeniaca* Willd. (Çinbilgel 3749)	Boz şavlak, Karağan, Çöl çayı, Zorlatma otu		Aerial parts, Tea and oil	Antipyretic, colds, asthma, bronchitis and painkiller	6, 27, 32, 33
	61	*P. fruticosa L.* (Çinbilgel 9374)	Çoban çırası, Karağan çalısı, Parşamba		All parts, Tea and bath	Rheumatism	32
	62	*P. grandiflora* H.S.Thompson var. *grandiflora* (Çinbilgel 8755)	Karağan, Bahar gülü, Çalba, Ayıkulağı		Leaves and All plant, Extracts	Pain, reduce cholesterol and Animal food	25, 27, 39, 40
	63	*P. leucophracta* P.H.Davis & Hub.–Mor. (Çinbilgel 9247)	Karağan, Çalba	End.			25, 27, 36, 38
	64	*P. lunariifolia* Sm. (Çinbilgel 9964)	Karağan, Ayı kulağı				22, 27, 35
	65	*P. nissolii* L. (Çinbilgel 9898)	Öbek çalba	End.			22, 29, 35
	66	*P. pungens* Willd. var. *hirta* Velen.	Silvanok				22, 36

		(H. Demirelma 1855)				
	67	*P. rigida* Labill. (A.Duran 3524)	Diri çalba			22, 35
	68	*P. samia* L. (Çinbilgel 9428)	Karağan, Pembe çalba			22, 27, 29, 36
	69	*P. tuberosa* L. (H. Demirelma 1801)	Yer çalbası			36
	70	*P. viscosa* Poir. (Çinbilgel 1713)	Karağan, Yağlı çalba			25
PRUNELLA L. (Acıfesleğen)	71	*P. laciniata* (L.) L. (Çinbilgel 9781)	Bodur fesleğen, Yara otu	Leaves, Extracts	Wounds healing	13, 27, 32, 36
	72	*P. orientalis* Bornm. (Çinbilgel 8009)	Acı fesleğen			27, 32, 36, 38
	73	*P. vulgaris* L. (Çinbilgel 9764)	Gelincikleme otu, Yara otu	Aerial parts, Tea and extracts	Wounds healing and expectorant	13, 27, 32, 33
ROSMARINUS L. (Biberiye)	74	*R. officinalis L.* (observ.)	Biberiye, Kuşdili	Leaves and fresh shoots, Tea and spice	Headache, cough, diabetes, indigestion and heart palpitations	32, 40
SALVIA L. (Adaçayı, Şalba, Şavla, Şabla)	75	*S. adenocaulon* P.H.Davis (Çinbilgel 5615)	Kızlaryülmesi	End.		22, 27, 35, 36
	76	*S. adenophylla* Hedge & Hub.-Mor. (Özçelik 10742)	Poruk	End.		32
	77	*S. bracteata* Banks & Sol. (Hub.-Mor. 8369!)	Çoban şalbası			12, 22
	78	*S. cadmica* Boiss. var. *cadmica* (Çinbilgel 6856)	Kaya şalbası, Ada çayı	End.	Aerial parts, Tea	Cold and flu	13, 22, 27, 38
	79	*S. candidissima* Vahl subsp. *candidissima* (H. Demirelma 2567)	Galabor			22, 36
	80	*S. dichroantha* Stapf (H. Demirelma 1181)	Kutnu	End.		22, 35, 36
	81	*S. heldreichiana* Boiss. ex Benth. (H. Demirelma 2722)	Ayaklı şalba	End.		22, 36
	82	*S. microstegia* Boiss. & Balansa Çinbilgel 3064)	Yağlambaç			22, 27, 35, 36
	83	*S. pratensis* L. (observ.)	Bozot	Leaves and flowering branches, Tea	Appetizing	32
	84	*S. sclarea* L. (Çinbilgel 4112)	Paskulak, Şalba, Dağ çayı	Leaves, Tea	Cold	25, 32, 33, 38
	85	*S. staminea* Montbret & Aucher ex Benth.	Erkek şalba			22, 35

		(A.Duran 2766)					
	86	*S. syriaca* L. (Dural 1765)	Çevlik otu				12, 22, 31
	87	*S. tomentosa* Mill. (Çinbilgel 9575)	Şalba, Yakı otu		Aerial parts, Extract (oil) and Tea	Asthma, cold and wound healing	6, 25, 27, 32
	88	*S. verbenaca* L. (Çinbilgel 7323)	Elma kekiği				25, 27
	89	*S. verticillata* L. subsp. *amasiaca* (Freyn & Bornm.) Bornm. (Çinbilgel 9474)	Dadirak, Karabaş otu		Aerial parts, Tea	Laxative, cold, abdominal pain, stomachache, nausea	33, 36, 38, 46
	90	*S.virgata* Jacq. (Çinbilgel 9015)	Fatmana otu, Kır kekiği, Ada çayı, Ellik otu		Aerial parts, Tea and spice	Cold and hemorrhoid	6, 13, 25, 27, 32
	91	*S. viridis* L. (Çinbilgel 8894)	Zarif şalba, Ada çayı		Aerial parts, Tea	Cold and flu	13, 25, 27, 38
SATUREJA L. (Kayakekiği)	92	*S. cuneifolia* Ten. (Çinbilgel 10038)	Kaya kekiği, Taş kekiği, Dağ kekiği, Yayla kekiği		Leaves and flowering branches, Tea and in foods as spice	Upper respiratory infection, cold, abdominal pain	25, 27, 39, 46
	93	*S. thymbra* L. (Çinbilgel 9475)	Halil İbrahim zahteri, Sivri kekik, Kaya kekiği, Taş kekiği, Aşk kekiği, Peynir kekiği		Leaves, flowering branches and fresh shoots, Oil, Tea and spice	Reduce cholesterol, gingivitis and vasodilating	27, 32, 38, 40
SCUTELLARIA L. (Kaside)	94	*S. altissima* L. (H. Demirelma 1777)	Uzun kaside				36
	95	*S. brevibracteata* Stapf subsp. *brevibracteata* (Çinbilgel 10036)	Yağlı kaside	End.			22, 25, 27, 36
	96	*S. brevibracteata* Stapf subsp. *subvelutina* (Rech.f.) Greuter & Burdet (Çinbilgel 5644)	Kadife kaside				27, 36
	97	*S. megalaspis* Rech.f. (Özçelik 11621)	Koca kaside				32
	98	*S. pinnatifida* subsp. *alpina* (Boiss.) Rech.f. (Çinbilgel 3079)	Kaside otu			Abdominal pain, stomach pain	25, 27, 32, 33
	99	*S. salviifolia* Benth. (Çinbilgel 4047)	Has kaside	End.			25, 27, 36, 38
SIDERITIS L. (Dağ çayı, Çay otu, Dallı, Ada çayı)	100	*S. arguta* Boiss. & Heldr. (Çinbilgel 2013)	Köy çayı, Çay, Sarı çay	End.	Leaves and flowering branches, Tea	Appetizing, cold, diarrhea, sedative and carminative	22, 25, 38, 39
	101	*S. bilgeriana* P.H.Davis (Dural 1804)	Altınbaş çayı	End.			12, 22, 31
	102	*S. brevibracteata* P.H.Davis	Hacımemetli çayı	End.			12, 22, 31

		(Dural 1562)					
	103	*S. condensata* Boiss. & Heldr. (Çinbilgel 7088)	Kozalı kekik, Çay, Sarı çay	End.	Aerial parts, Tea	Cold, flu and Relaxing tea	27, 32, 36, 38
	104	*S. congesta* P.H.Davis & Hub.-Mor. (Çinbilgel 8918)	Başak çayı, Çay, Sarı çay	End.	Aerial parts, Tea	Cold, flu and Relaxing tea, Tonic	22, 32, 37, 38
	105	*S. erythrantha* Boiss. & Heldr. var. *erythrantha* (Çinbilgel 4267)	Mor çay, Çay, Dağ çayı, Yayla çayı	End.	Aerial parts, Tea	Relaxing tea, flu and cold	27, 32, 36, 38
	106	*S. leptoclada* O. Schwarz & P.H.Davis (H. Demirelma 1237)	Kızlan çayı	End.			22, 36
	107	*S. libanotica* Labill. subsp. *linearis* (Benth.) Bornm. (H. Demirelma 1558)	Toros çayı, Yayla Çayı, Çay otu, Boz çay, Diken çayı		Leaves and flowering branches, Tea	Appetizing, cold, diarrhea, sedative and carminative	32, 36, 39, 40
	108	*S. libanotica* Labill. subsp. *violascens* (P.H.Davis) P.H.Davis (H. Demirelma 2800)	Topuklu çay	End.			22, 31, 35, 36
	109	*S. perfoliata* L. (Çinbilgel 1012)	Eşek çayı, Fincan çayı, Çay, Sarı çay, Adaçayı		Leaves, flowering branches and fresh shoots, Tea	Reduce cholesterol and vasodilating, animal food	25, 32, 38, 39
	110	*S. pisidica* Boiss. & Heldr. (Çinbilgel 4186)	Eldiven çayı, Çay, Sarı çay, Hava otu	End.	Leaves and flowering branches, Tea and extracts	Tonic and abdominal pain	27, 37, 45
	111	*S. serratifolia* Hub.-Mor. (Özçelik 11571)	Fenerli çayı	End.			22, 32
	112	*S. stricta* Boiss. & Heldr. (H. Demirelma 3007)	Tilki kuyruğu çayı	End.			22, 32, 36, 38
STACHYS L. (Deli çay, Dağ çayı, Ada çayı)	113	*S. aleurites* Boiss. & Heldr. (Çinbilgel 9043)	Köprülü çay	End.			28
	114	*S. annua* (L.) L. subsp. *annua* var. *lycaonica* R.Bhattacharjee (H. Demirelma 2361)	Hacıosman otu				22, 36, 38
	115	*S. arvensis* (L.) L. (Hub.-Mor. 17718)	Tarla karabaşı				12, 38
	116	*S. byzantina* K.Koch (Çinbilgel 4256)	Boz karabaş, Boz çay, Eşek otu		Aerial parts, Tea	Cold	13, 25, 27, 36
	117	*S. citrina* Boiss. & Heldr. ex Benth. subsp. *citrina* (Çinbilgel 3680)	Altın karabaş, Boz çay	End.			22, 27, 35, 36
	118	*S. cretica* L.	Yağlı kara,	End.	Leaves	Cold, stomach ailments	13, 27, 33,

		subsp. *anatolica* Rech.f. (Çinbilgel 5419)	Boz çay, Dağ çayı, Kestire		and flowering branches, Tea		36
	119	*S. cretica L.* subsp. *mersinaea* (Boiss.) Rech.f. (Hub.-Mor. 17719!)	Boncuk Şalba	End.			22, 38
	120	*S. cretica* L. subsp. *smyrnaea* Rech.f. (Hub.-Mor. 17248)	İzmir deli çayı	End.			12, 22, 31, 38
	121	*S. cretica* L. subsp. *vacillans* Rech.f. (Çinbilgel 1715)	Dik deli çay, Boz çay				22, 25, 35, 36
	122	*S. iberica M.Bieb.* subsp. *iberica* var. *densipilosa* R.Bhattacharjee (Özçelik 10247)	Tok deli çay	End.			32
	123	*S. lavandulifolia* Vahl (Çinbilgel 8757)	Tüylü çay, Yayla çayı, Boz çay, Tokalı çay		Leaves and flowering branches, Tea	Relaxing tea and stomachache	27, 36, 39, 45
	124	*S. longispicata* Boiss. & Kotschy (Özçelik 10423)	Ak deli çay				32
	125	*S. pumila* Banks & Sol. (Özçelik 11039)	Sarı karabaş				32
	126	*S. pseudopinardii* R.Bhattacharjee & Hub.-Mor. (Özçelik 10241)	Ak çayçe	End.			32
	127	*S. woronowii* (Schischk. ex Grossh.) R.R.Mill. (Çinbilgel 8805)	Ardıç karabaşı				25, 27, 31, 36
TEUCRIUM L. (Kısamahmut)	128	*T. chamaedrys* L. subsp. *chamaedrys* (Çinbilgel 5503)	Kısamahmut, Yer kekiği, Sancı otu		Leaves and flowering branches, Tea	Stomachache, headache, toothache, kidney pain, digestive, heart diseases and sedative	6, 25, 33, 38
	129	*T. chamaedrys* L. subsp. *lydium* O.Schwarz (Çinbilgel 3939)	Bodur mahmut				22, 27, 35, 38
	130	*T. chamaedrys* L. subsp. *tauricola* Rech.f. [Shmida & Luria(!)]	Çoban sargısı				12, 38
	131	*T. kotschyanum* Poech (Çinbilgel 9584)	Zırnık otu				28
	132	*T. lamiifolium* d'Urv. subsp. *lamiifolium* (Çinbilgel 9446)	Kumacı otu				25, 27, 36, 38
	133	*T. montanum* L. subsp. *montanum* (H. Demirelma 3031)	Dağdalak				22, 36
	134	*T. montbretii*	Sürmeli	End.			28

		Benth. subsp. *pamphylicum* P. H. Davis (Çinbilgel 9048)	fatmacık otu				
	135	*T. polium* L. subsp. *polium* (Çinbilgel 9992)	Tüylü kısa mahmut otu,		Leaves, flowering branches and fresh shoots, Tea	Stomach problems, intestinal disorders, diarrhea, digestive, hemorrhoid and malaria	6, 25, 27, 32
	136	*T. scordium* L. subsp. *scordioides* (Schreb.)Arcang. (Çinbilgel 2010)	Kurtluca				25
THYMBRA L. (Zahter)	137	*T. spicata* L. subsp. *spicata* (Çinbilgel 9556)	Zahter, Aş kekiği, Kara kekik, Karabaş kekik, Taş kekiği, Dağ kekiği		Leaves, flowering branches and fresh shoots, Tea, oil and spice	Diabetes, ulcer, hypertension, appetizing, cough, cold and shortness of breath, tonsillitis and tonsils pain, asthma	25, 32, 38, 39
THYMUS L. (Kekik, Yer kekiği, Dağ kekiği, Yayla kekiği)	138	*T. cherlerioides* Vis. (observ.)	Kaz kekiği	End.	Leaves, flowering branches and fresh shoots, Tea	Diabetes, ulcer, hypertension, cold and shortness of breath	32, 38
	139	*T. cilicicus* Boiss. & Balansa (Çinbilgel 6234)	Kılçık kekiği, Yer kekiği, Yayla kekiği, Dağ kekiği, Limon kekiği		Aerial parts, Tea	Stomachache, toothache, tranquilizer	27, 36, 40
	140	*T. leucotrichus* Hal. subsp. *leucotrichus* (Çinbilgel 5345)	Dağ kekiği				22, 27, 31, 35
	141	*T. longicaulis* C.Presl subsp. *chaubardii (*Rchb.f.) Jalas (Çinbilgel 5304)	Dağ kekiği, Yayla kekiği				22, 27, 36
	142	*T. longicaulis* C.Presl subsp. *longicaulis* (Çinbilgel 6177)	Aş kekiği, Yayla kekiği				27, 32
	143	*T. revolutus* Celak. (Çinbilgel 9640)	Kum kekiği	End.			22, 28, 35
	144	*T. sibthorpii* Benth. (H. Demirelma 2626)	Top kekik		Leaves, flowering branches and fresh shoots, Tea	Diabetes, ulcer, hypertension, cold and shortness of breath	22, 32, 36
	145	*T. sipyleus* Boiss. (Çinbilgel 4923)	Sipil kekiği, Yayla kekiği, Dağ kekiği		Aerial parts, Tea and spice	Stomachache, hemorrhoid, diabetes and vasodilating	13, 27, 31, 34, 36
	146	*T. zygioides* Griseb. (observ.)	Bodur kekiği				32
VITEX L. (Hayıt)	147	*V. agnus – castus* L. (Çinbilgel 1169)	Hayıt		Fruits and seeds, Tea	Relaxing tea, menstrual problems, carsinoma	25, 27, 32, 36
ZIZIPHORA L. (Anuk, Dağ reyhanı)	148	*Z. capitata* L. (Çinbilgel 9833)	Anuk, Dağ reyhanı, Çay kekiği		Leaves and flowering branches, Spice	Cold	13, 25, 27, 36
	149	*Z. clinopodioides* Lam.	Dağ reyhanı, Keklik otu,		Aerial parts, Tea	Stomachache, gastrointestinal	27, 32, 33, 47

(Çinbilgel 3843)	Kır nanesi, Nane ruhu, Reyhan	disorders, carminative, orexigenic, cold and honeybee plant

End.=Endemic, observ.=observation