The preliminary ethnobotanical survey of medicinal plants in Develi (Kayseri/Turkey)

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ABSTRACT

Background and Aims: In Turkey, there is a growing interest in ethnobotany due to the wealth of biological and cultural diversity. The main purpose of this study is to record and highlight the medicinal plants used therapeutically in the Develi district.

Methods: The data were obtained during different seasons of 2010-2011 through face-to-face interviews. Medicinal plants were collected with the guidance of the informants, and traditional uses was recorded. Botanical identification of all the species was made, and voucher specimens were deposited at Istanbul University, Herbarium of the Faculty of Pharmacy (ISTE).

Results: The informants reported data on 14 medicinal plants belonging to 8 botanical families. These medicinal plants are used for about 26 different purposes. The most dominant family is Lamiaceae (6 species) followed by Asteraceae (2 species). Various plant parts such as leaf, fruit, flower, root, wood and fruity branch are used; the aerial part is consumed more frequently than other plant parts.

Conclusion: Despite the modernization and cultural change, many people still benefit from the plants distributed in the Develi district. This study offers valuable information on the traditional knowledge of medicinal plants, which could form a basis for future phytochemical and pharmacological researches.

Keywords: Develi, ethnobotany, Kayseri, medicinal plants, Turkey

INTRODUCTION

Turkey has a rich flora with over 11000 taxa, approximately 34% of these are endemic. Our country gets ahead of all European countries in terms of the number of endemic plants (Güner et al., 2018; Güner, 2014). This floristic richness and cultural heritage from the past constitute a great deal of ethnobotanical knowledge which should be revealed (Yeşilada, 2013; Kendir & Güvenç, 2010).

As known, many ethnobotanical practices such as making tools or using medicinal plants are generally learned in situ, as children work alongside parents or elder siblings. However, technological developments and modernization change the socio-cultural structure of the society, and it is becoming more difficult to conduct ethnobotanical studies or access to information about ethnobotanical practices. Therefore, ethnobotanical data which is about to disappear attracts scholarly attention and many researchers have begun to document this academic value (Güner, 2014; Yeşilada, 2013; Kendir & Güvenç, 2010; Cotton, 1996).

In Turkey, ethnobotanical studies have become increasingly recognised as a valuable source of information on the use and conservation of many plants, particularly after the 1980s. Many systematic field studies have begun to record traditional medicine carefully, and thus become an important resource for drug discovery research (Yeşilada, 2013; Baytop, 1999). Throughout recent years, numerous ethnobotanical studies have been published in Turkey concerning the traditional use...
of medicinal plants and many studies have been conducted in Central Anatolia ( Sağıroğlu, Topuz, Ceylan, & Turna, 2013; Gençler Özkan & Koyuncu, 2005; Sezik et al., 2001; Doğan, Başlar, Ay, & Mert, 2004; Bağcı, 2000; Bağcı, 2000).

Kayseri province is located in the central Kızılırmak section of Central Anatolia. Its eastern part is situated in upper Kızılırmak River while the southern part is in the Mediterranean region. General characteristics of the Irano-Turanian vegetation types prevail in this region, these vegetation elements such as *Consolida orientalis* (J.Gay) Schrödinger, *Glaucium flavum* Crantz, *Fumaria officinalis* L., *Isatis glauca* Aucher, *Capsella bursa-pastoris* (L.) Medik., *Silene conica* subsp. *subconica* (Finn.) Gavioli, *Peganum harmala* L., *Melilotus officinalis* (L.) Pall., *Cirsium arvense* (L.) Scop., *Sideritis lanata* L., *Salvia multicaulis* Vahl, *Euphorbia orientalis* L., *Cynodon dactylon* (L.) Pers. can be seen in various areas of Kayseri province (Türkmen, 2006). This floral and also cultural richness forms a basis for noteworthy ethnobotanical knowledge. Although there are some prior ethnobotanical studies that have been carried out in various regions of Kayseri ( Sağıroğlu et al., 2013; Gençler Özkan & Koyuncu, 2005; Sezik et al., 2001; Bağcı, 2000), traditional uses of medicinal plant in the Develi district have not been reported. The aim of the present study is to provide information about the ethnobotanical properties of medicinal plants which are used traditionally by the local people of the Develi district.

**MATERIAL AND METHODS**

**Study area**

Develi, which is one of the biggest districts of Kayseri, is situated in the central part of Turkey. Develi was established 6 km from the south of Mount Erciyes (38°23’18.6”N, 35°29’31.3”E), is surrounded by Tomarza District and Tufanbeyli District of Adana Province in the east, Yahyalı District and Saimbeyli-Feke Districts of Adana Province in the south, Yeşilhisar District in the west and İncesu District in the northwest (Figure 1). Develi is included in Irano-Turanian flora region and falls within the B5 grid square according to the Grid classification system used in the Flora of Turkey (Davis et al., 1988; Davis, 1965-1985).

The surface area of the district is 1887 km², and the altitude of the central district is 1150 m above sea level. The total population is 65,745 according to the population census in 2019. The most important mountains of the region are Erciyes Mountain, Karasivri Mountain, Büyük Kartın (Peri Kartın), Göktepe, Sümengen (Suvegen) and Bakır Mountain. The reedfield Sultan Sazlığı, which is located at the lowest part of the Develi plain, contains important floral and faunal communities. Develi is one of the least precipitation areas of our country. The average annual rainfall varies between 300 and 500 mm, and it usually falls in spring. The annual average temperature is calculated as 10.6°C. Develi has hosted various civilizations for centuries. Although the first settlement date could not exactly be determined, some ruins of the Hittite period were found in the region. After the domination of Phrygians, Persians and Seljuks, the district passed to the Ottoman administration in 1474. Develi was accepted as the district of Kozan province until 1926. When the status of Kozan changed, Develi became Kayseri district (Türkmen, 2006).

**Data collection, plant materials**

A field study was carried out during different seasons of 2010-2011 in the Develi district of Kayseri. After the local people were informed about the study, face-to-face interviews were held in order to document ethnobotanical knowledge. Related data were obtained from local people by using interview questions including information on local plant names, ailments and diseases treated, therapeutic effects, parts of plants used. All plant specimens were collected together with accompanied informants. Plant specimens were numbered and pressed in the field (Figures 2-5).
Collected plant specimens were identified by two of the authors (Rıdvan Çolak, Şükran Kültür) using references, i.e. Flora of Turkey and the East Aegean Islands (Davis, 1965-1985; Davis, Mill, & Tan, 1988; Güner et al., 2000) and Türkçe Bitki Adları Sözlüğü (Baytop, 1994), and compared with specimens stored in Istanbul University, Herbarium of the Faculty of Pharmacy (ISTE). The voucher specimens were deposited in the ISTE Herbarium. The names of plant families were listed in alphabetical order. Scientific names of identified taxa were updated according to The Plant List (http://www.theplantlist.org/). Ethnobotanical data were screened to reveal whether the plants used have literature records or not.

**RESULT AND DISCUSSION**

A total of 14 plant species with ethnobotanical importance belonging to 8 botanical families were found out and documented in this research. Each species is presented with its corresponding botanical identity, herbarium sample number, family name, vernacular name, part used and ethnobotanical usage.

**Alcea pallida (Willd.) Waldst. & Kit., R. Celik 08, Malvaceae**

Vernacular name: Gülhatmi, Gülfatma

Used parts: Leaves, roots

Ailments treated/Therapeutic effect: Asthma, cough, expectorant, diuretic (leaves)

Previous ethnobotanical literature records: Cough (Kurnaz Karagöz & Serteser, 2017; Tetik, Civelek, & Çakılçioğlu, 2013; Demirci & Özhatay, 2012; Keskin, 2011; Saday, 2009; Karataş, 2007; Bağcı, 2000), bronchitis (Tetik et al., 2013; Saday, 2009; Demirci & Özhatay, 2012), stomach diseases (Bağcı, 2000),
ophthalmia (Şaçıroğlu et al., 2013), toothache (Şaçıroğlu et al., 2013), ornamental plant (Keskin, 2011), respiratory disorders (Kurnaz Karagöz & Şerteser, 2017; Keskin, 2011; Karataş, 2007), gingivitis (Oraş, 2007), painkiller, kidney stone (Karataş, 2007), smoothing throat (Keskin, 2011)

**Ajuga chamaepestis subsp. laevigata (Boiss.) P.H.Davis, R. Celik 05, Lamiaaceae**

Vernacular name: Karın ağrısı otu, Bodur otu
Used parts: Aerial parts
Ailments treated/Therapeutic effect: Abdominal pain, severe diarrhea (especially in animals), wound healing
Previous ethnobotanical literature records: Diabetes (Polat & Çakıcıoğlu, 2018), removing fear, constipation (Kaya, Dağlı, & Celik, 2020)

**Crataegus meyeri Pojark., R. Celik 13, Rosaceae**

Vernacular name: Aič
Used parts: Fruits, wood
Ailments treated/Therapeutic effect: Vasodilator, kidney and urinary tract purification
Previous ethnobotanical literature records: Antidiarrheal (Yeşil & Akalın, 2009), diabetes (Şenkardeş, 2014; Yeşil & Akalın, 2009), asthma, hemorrhoids (Tetik et al., 2013), cardiovascular diseases (Şenkardeş, 2014; Gençler Özkan & Koyuncu, 2005), rheumatism ( Gençler Özkan & Koyuncu, 2005), kidney stone, constipation, foodstuff, fuel, tool (Şenkardeş, 2014)

**Echinops ritro L., R. Celik 14, Asteraceae**

Vernacular name: Deve dikeni
Used parts: Aerial parts
Ailments treated/Therapeutic effect: Stomachache
Previous ethnobotanical literature records: Foodstuff (Şenkardeş, 2014; Ertuğ, 2000), soup, seasoning, dressing (Doğan et al., 2004)

**Helichrysum plicatum DC., R. Celik 06, Asteraceae**

Vernacular name: Altın otu
Used parts: Aerial parts
Ailments treated/Therapeutic effect: Intestinal inflammation, hemorrhoid
Previous ethnobotanical literature records: Cholesterol management, cancer (Güneş, Savran, Paksoy, Koşar, & Çakıcıoğlu, 2018; Özüdoğru, Akaydın, Erik, & Yeşilada, 2011), fodder (Ertuğ, 2000), stomach complaints (Özüdoğru et al., 2011)

**Lavandula stoechas L., R. Celik 03, Lamiaaceae**

Vernacular name: Karabaş otu
Used parts: Aerial parts, flowers
Ailments treated/Therapeutic effect: Headaches, smoking cessation (as an aid)
Previous ethnobotanical literature records: Cancer (Sargin & Büyükcengiz, 2018; Akan & Bakır Sade, 2015), sedative (Sargin & Büyükcengiz, 2018), pains, smoking cessation (Akan & Bakır Sade, 2015; Sargin, 2015), cardiovascular disease (Güneş et al., 2017; Sargin, 2015; Çömeldikçiölu & Karaman, 2008), vasodilator, asthma, bronchitis, headache, brain diseases, ulcer, hypertension, insomnia (Sargin, 2015), stomachache (Güneş et al., 2017; Abay & Kılıç, 2001), analgesic (Sargin & Büyükcengiz, 2018), nephropathy (Sargin, 2015), stomach ulcer, diuretic (Özüdoğru et al., 2011), wound (Sezik et al., 2001; Tetik et al., 2013), ear ache (for baby) (Demirci & Özhatay, 2012), jaundice, dysuria, snake repellent (Yeşilada et al., 1995), antifungal, urinary dysfunction (Karaman & Kocabab, 2001), constipation (Çömeldikçiölu & Karaman, 2008)

**Marrubium anisodon K.Koch, R. Celik 07, Lamiaaceae**

Vernacular name: Elbir otu
Used parts: Aerial parts
Ailments treated/Therapeutic effect: Kidney stones, female infertility, regulates the blood pressure
Previous ethnobotanical literature records: Not reported.

**Melissa officinalis L., R. Celik 01, Lamiaceae**
Vernacular name: Melisa, Oğul otu
Used parts: Leaves
Ailments treated/Therapeutic effect: Cough, asthma, sedative
Previous ethnobotanical literature records: Arteriosclerosis (Paksoy, Selvi, & Savran, 2015), sedative, stress, vasodilator, soporific, female sterility (Sargin, 2015), headache, cardiovascular diseases (Demirci & Özhatay, 2012), insomnia, scorpion bite, bath, heart palpitation (Akan & Bakır Sade, 2015), tranquilizer, antidepressant, anaphynerg, gastritis, angioenahys, epilepsy, fainting, allergy, digestive, cardiotoxic, hearth stimulant, carminative, spasmylytic, diaphoretic, disinfectant (Everest & Öztürk, 2005), cholesterol, hypertension (Oral, 2007), flu infections (Koçak & Özhatay, 2013), anemia, diabetes, memory (Akgül et al., 2016), thyroid, sleep disturbances, stress, digestion system (Saltan & Özaydın, 2013), antiseptic, cold (Karaman & Kocabas, 2001)

**Peganum harmala L., R. Celik 11, Nitrariaceae**
Vernacular name: Yüzellik, Güzellik otu
Used parts: Fruity branches, fruits
Ailments treated/Therapeutic effect: Protect against the evil eye, allergic asthma
Previous ethnobotanical literature records: Amulet (Özüdoğru et al., 2011), sedative, hemorrhoids, vermifuge, menstrual diuretic (Özdemir & Alpinar, 2015), evil eye, ornaments (Öztürk, 2004), expectorant, stimulating nervous system, hair loss, eczema, malaria, dye (Akan & Bakır Sade, 2015), Parkinson, insomnia (Yaşar, Koyuncu, Turan Koyuncu, & Ku, 2019; Akan & Bakır Sade, 2015), emmenagogue, narcotic, sedative, nutritive, cephalalgia, anti hysteria, natalgia, ophthalmalgia, omalgie, hand-tremble (Everest & Öztürk, 2005), anthelmintic, stomachache (Tugay et al., 2005), headache, hypertension, carminative (for babies) (Oral, 2007), shortness of breath, stomach ulcer, hair dranduff, hair care (Şenkardeş, 2014), foodstuff (Hakverdi & Yiğit, 2017); dermal diseases (Vural, Karaveliğullan, & Polat, 1997).

**Sideritis libanotica subsp. linearis (Benth.) Born., R. Celik 04, Lamiaceae**
Vernacular name: Dağ çayı
Used parts: Aerial parts
Ailments treated/Therapeutic effect: Smoothing throat, vasodilator, diabetes
Previous ethnobotanical literature records: Cold (Demirci & Özhatay, 2012; Yeşil & Akalın, 2009), flu (Demirci & Özhatay, 2012), as a tonic (Yeşilada et al., 1993), foodstuff (Doğan et al., 2004), throat and flu infections (Oral, 2007)

**Teucrium chamaedrys subsp. syspirense (K.Koch) Rech.f., R. Celik 02, Lamiaceae**
Vernacular name: Kısamahmut otu
Used parts: Aerial parts
Ailments treated/Therapeutic effect: Hemorrhoid, intestinal fungal infections, antitode
Previous ethnobotanical literature records: Diabetes (Dalar, 2018), foodstuff (as tea) (Aksakal & Kaya, 2008)

**Verbascum sp., R. Celik 10, Scrophulariaceae**
Vernacular name: Yalancı sığır kuyruğu
Used parts: Fruits, leaves
Ailments treated/Therapeutic effect: Allergic asthma
Previous ethnobotanical literature records: draining inflammation, cough, pain of abartication or broken bones (Aksydn et al., 2013), asthma, expectorant (Sargin & Büyükcengiz, 2018), pruritus, shortness of breath, hair loss, dyestuff, uterine inflammations (Özüdoğru et al., 2011), urinary inflammations, fissures on hand, abdominal pain (Gençler Özkancı & Koyuncu, 2005), warts (Savran et al., 2008), sinusitis, nepatitis, hemorrhoids (Tuzlacı & Şenkardeş, 2011), bronchitis (Saday, 2009).

The Lamiaceae family (6 species) is the most commonly used and species-rich family in this study. It is followed by Asteraeae (2 sp.), Hypericaceae (1 taxon), Malvaceae (1 taxon), Rosa ceae (1 taxon), Scrophulariaceae (1 taxon), Apiaceae (1 taxon) and Nitrariaceae (1 taxon), by their number of species. Aerial parts were primarily used for ethnobotanical uses by local people. Other used plant parts were found as leaf, fruit, flower, root, wood and fruity branch, respectively (Figure 6). During this study, a total of 26 traditional usages were recorded. Medicinal plants were used for both human and animal health. *Ajuga chamaeapitys* subsp. *laevigata* (Boiss.) P. H. Davis was not used only in humans but also in animal treatment. Besides the treatment of diseases, people benefited from plants for different purposes. They believed that *Peganum harmala* L. protects them from the evil eye.

**Figure 6**. Plant parts used for ethnobotanical purposes ranked by frequency of use.
Some aforementioned medicinal plants contain toxic constituents that adversely affect human health; for this reason, overdose or side effects of these plants can be dangerous according to the literature. *Teucrium chamaedrys* subsp. *syspirense* is known as a hepatotoxic plant, therefore, it should not be administered without the recommendation of authority in proper use. Photosensitization of *Hypericum perforatum* in proper use. Photosensitization of *Hypericum perforatum* L. were detected as five shared taxa used. In addition to similarities in uses, some different uses are also noticeable. For instance, while *C. meyeri* was used in the treatment of cardiac disorders and rheumatism in Pinarbaşı region ( Gençler Özkan & Koyuncu, 2005), people in the Develi district have benefited from its vasodilator and kidney - urinary tract purification properties.

**CONCLUSION**

The present study documented the traditional uses of 14 plant species belonging to 8 families of medicinal plants by local people. These plants are used either as a remedy for various diseases or for any other purposes in the Develi district of Kayseri. The medicinal uses of *Marrubium anisodon* were recorded for the first time in this study. It is noteworthy that local people mainly use aerial parts of the plants not underground parts (rhizomes, roots and bulbs). They make contributions to the conservation of the species in the region by preventing the indiscriminate cutting or removing the entire plant.

Since the ethnomedical knowledge of local plants is mainly possessed by elder family members and transmitted from generation to generation, more studies should focus on compiling as much information as possible before the eventual elimination of traditional knowledge. It is believed that this study provides valuable information on medicinal plants, reinforcing the importance of continuing with ethnomedical research in Turkey, which can lead to the development of new pharmaceuticals.

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