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# Medicinal plants used in Orhaneli and Büyükorhan Districts (Bursa – Northwest Anatolia)

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**Abstract.** This study was aimed to determine the medicinal plants used by local people living in the villages of Orhaneli and Büyükorhan districts, Bursa province. During field research was conducted between the years 2016 and 2018, medicinal plant species and related knowledge were collected and the plant samples were stored as herbarium materials. For to get information about medicinal plants face to face interviews were made with local people. A total of 49 plant species belonging to 25 families were identified. Among them 43 taxa were wild and 6 taxa were cultivated. The most used families were Lamiaceae (10 taxa), Rosaceae (6 taxa), Apiaceae (3 taxa) and the most used preparation methods of total 82 remedies were infusion and decoction. It was found that medicinal plants were used by the local people mainly for treatments of respiratory and throat diseases, gastro-intestinal system and kidney and urinary system disorders.

Key words: Bursa, Büyükorhan, ethnobotany, folk medicine, medicinal plants, Orhaneli

## Introduction

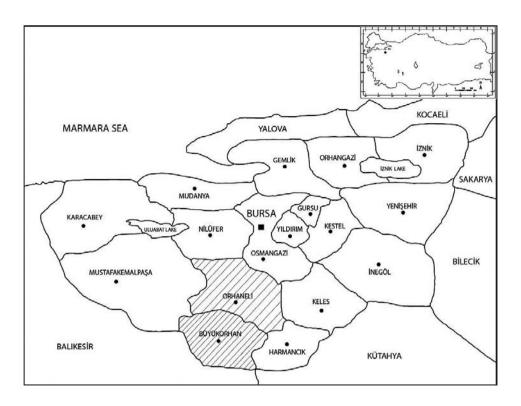
Turkey is one of the important countries in the Northern Hemisphere in terms of plant diversity. Flora of Turkey consists of 11.707 taxa and 3649 of them are endemic to Turkey, endemism ratio is about 32% (Güner & al. 2012). The endemism ratio is very high when compared with other European countries, for example this ratio is 18,6% in Spain, 14,9% in Greece and 2,9% in France (Avci 2005).

Turkish people have been used plants for their medicinal needs for decades. It is known that approximately 600 plant species are used for medicinal purposes in Turkey. (Baytop 1999). Previously, some ethnobotanical and folk medicinal studies have been carried out in Bursa and its surroundings (Tuzlacı & Tolon 2000; Tuzlacı & Aymaz 2001; Ecevit & Özhatay 2004; Şanlı 2006; Koçyiğit & Özhatay 2006; Kültür 2007; Kültür 2008; Bulut & Tuzlacı 2015; Aktan 2011; Bulut 2011; Poyraz Kayabaşı 2011; Polat & Satıl 2012). The aim of this study is to determine naturally growing plants used for medicinal purposes and their usage methods by the people living in the study area. Although the flora of this area and its surroundings was studied by Daşkın & Kaynak (2010 a, b) and Bağçıvan (2017), there was any research about medicinal plants of the area. Thus, this study is the first ethnobotanical research about the medical usages of the plants used by local people living in these districts.

## Material and methods

The study area is covering Orhaneli and Büyükorhan districts which located in south of Bursa province, close to European part of Turkey, and it is neighboring Balıkesir province (Fig. 1).

The study area is also situated in mountainious area of the Bursa province. The major part of the area is covered by dry forests characterized with *Pinus nigra* J. F. Arnold ssp. *nigra* var. *caramanica* (Loudon) Rehd.,



**Fig.1.** Map of Bursa province and study area.

*P. brutia* Ten., *Quercus cerris* L. and *Q. petrae* (Matt.) Liebl. ssp. *iberica* (Steven ex M. Bieb.) Krassiln. However, where these forests are destroyed maquis elements such as *Juniperus oxycedrus* L. ssp. *oxycedrus*, *Q. infectoria* Oliv. ssp. *infectoria*, *Phyllirea latifolia* L., *Paliurus spinachristii* Mill., *Cistus creticus* L., *C. salviifolius* L., *Arbutus andrachne* L., *Rhus coriaria* L. and *Pistacia terebinthus* L. ssp. *palaestina* (Boiss.) Engler are common. The mixed deciduous forests consisting of *Fagus orientalis* Lipsky, *Carpinus betulus* L., *Alnus glutinosa* (L.) Gaertn. ssp. *glutinosa*, *Tilia argentea* Desf. ex DC., *Fraxinus ornus* L. ssp. *ornus* are found in local area such as Sadağı Valley, Orhaneli district.

During this study, 16 villages in Orhaneli and 10 villages in Büyükorhan district were visited and data about medicinal uses of plants were collected. All visited villages was numbered as following; Akçabük (1), Başköy (2), Çivili (3), Çöreler (4), Deliballılar (5), Erenler (6), Kabaklar (7), Koçuköy (8), Letafet (9), Ortaköy (10), Sadağı (11), Serçeler (12), Süleymanbey (13), Söğüt (14), Yenidanışment (15), Yörücekler (16) in Orhaneli district and Aktaş (17), Çakıryenice (18), Derecik (19), Durhasan (20), Görecik (21), Karalar (22), Kınık (23), Piribeyler (24), Yenice (25) and Zaferiye (26) in Büyükorhan district.

The data was obtained from 70 local people through face to face interviews between 2016 and 2018 years. The ratio of interviewees according to gender is 65% male and 35% female. Their ages was changed between 45 and 65. All of them have been living in their village since their birth and also most of them had only elementary education. They usually stated that knowledge about medicinal plants were obtained from their parents and elderly relatives.

The samples of plant species used for medicinal purposes were collected from natural locality and identified according to Flora of Turkey and East Aegean Islands (Davis, 1965–1985; Davis & al. 1988; Özhatay & al. 2000). The samples were stored at Herbarium of Bursa Uludağ University (BULU).

### Results and discussion

As a result of the study 49 medicinal plants belonging 25 families were determined. 43 taxa of them are wild and 6 taxa are cultivated. A total of 82 medicinal usage (remedies) were reported (Table 1). Local people are used mainly for the treatments of respiratory and throat diseases such as cold, flu, cough, sore throat, asthma, bronchitis, sinusitis (28%), gastro-intestinal system disorders (24,4%), kidney and urinary system disorders (17,1%). Other reported ailments are heart and vascular system diseases (7,4%), cuts, wounds and eczema (7,4%), head and toothache (6%), hemorroids (6%), diabetes (2,5%) and cancer (1,2%).

The medicinal plants and its treatments in the study area are presented Table 2 according to alphabetically order of their family and botanical names. Moreover, local names, used parts, preparation methods and ailments treated/therapeutic effect of these medicinal plants are also presented in Table 2. The most commonly used families were Lamiaceae (10 taxa), Rosaceae (6 taxa) and Apiaceae (3 taxa). The most frequently used medicinal plants were *Melissa officinalis* L., *Mentha longifolia* L. ssp. *thyphoides, Origanum sipyleum* L., *Salvia tomentosa* Mill., *Thymus longicaulis* C. Presl ssp. *longicaulis, Tilia argentea* and *Rosa canina* L. Only *Juniperus oxycedrus* were used for the treatment of animals in the study area.

Table 1. The categories of reported ailments from the study area.

Ailments category	Use citations	Rate of citations (%)
Respiratory and throat diseases	23	28
Gastro-intestinal system disorders	20	24.4
Kidney and urinary system disorders	14	17.1
Heart and vascular system diseases	6	7.4
Healing cuts, wounds and eczema	6	7.4
Head and toothache	5	6
Hemorroids	5	6
Diabetes	2	2.4
Cancer	1	1.2

Table 2. Medicinal plants of Orhaneli and Büyükorhan Districs (Bursa Province).

FAMILY	Botanical name	Local name	Part used	Village number	Preparation	Ailments treated/ Therapeutic effect
ADIANTHACEAE	<i>Adianthum capillus-veneris</i> L.	Baldırıkara, karabaldır	Aerial parts	13	Decoction	Cough and expectorant
AMARANTHACEAE	Beta vulgaris var. vulgaris L.	Çükündür	Leaves	20	Boiled	Stomachache
	<i>Chenopodium album</i> L. ssp. <i>album</i>	Sirken	Aerial parts	8,10	Fresh	Constipation and blood purifier
ANACARDIACEAE	Pistacia terebinthus	Menengiç, Sakızlık	Leaves	8, 23, 26	Infusion	Cough, asthma, bronchitis
APIACEAE	Ferula communis L. ssp. communis	Şeytanotu, Hiltik	Leaves	11, 15	Fresh	Heart and vascular diseases
	Anethum graveolens L.	Börekotu, Tarhanaotu, Duvakotu	Seeds	6	Fresh	Kidney stones
	Coriandrum sativum L.	Ay otu, Abaza otu	Aerial parts	2,10	Fresh	Menstrual pain
ARACEAE	Dracunculus vulgaris Schott	Yılan yastığı	Roots	12	Roasted and powdered, eat after mixed with honey	Hemorrhoid
ASTERACEAE	Matricaria chamomilla L.	Mayıs papatyası	Flowers	4	Infusion Maceration in olive oil	Cold, stomachache, sedative effect Rheumatism and scars
	Anthemis tinctoria L.	Boyacı papatyası	Flowers	2	Infusion	Cough, diarrhea
BRASSICACEAE	Brassica oleracea L.	Kelem	Leaves	8	Boiled	Cough
	Sinapis arvensis L.	Hardal otu	Aerial parts	18	Decoction	Cough, constipation
CISTACEAE	Cistus salviifolius L.	Tavşanak	Leaves	1	Decoction	Stomachache
	Cistus laurifolius L.	Yuvan	Leaves	25	Decoction	Ache treatment
CORNACEAE	Cornus mas L.	Kiren, Kızılcık	Fruits	10	Fresh or dried	Gastritis and ulcerate
CUCURBITACEAE	Cucumis melo L.	Kavun	Seeds	11,15	Fresh	Hemorrhoid, prostatae
	<i>Ecballium elaterium</i> (L.) A. Rich.	Dülek, Acı kavun	Fruits	18,19,25	Fruit juice was dropped into nostrils	Sinusitis
CUPRESSACEAE	Juniperus oxycedrus L.	Katran ardıcı	Stem	13	Decoction	Scars for animals
EQUISETACEAE	Equisetum arvense L.	Gavur çamı, Kırkkilit	Aerial parts	13	Infusion	Kidney stones
HYPERICACEAE	Hypericum perforatum L.	Kılıçotu, Koyunkıran, Yaraotu	Flowering braches	8,20	Infusion Maceration in olive oil under the sun	Sedative effect Sunburn and scars
JUGLANDACEAE	Juglans regia L.	Koş, Koz	Leaves	5	Decoction	Mouthwash for gum inflammation

FAMILY	Botanical name	Local name	Part used	Village number	Preparation	Ailments treated/ Therapeutic effect
LAMIACEAE	Lavandula pedunculata (Mill) Cav. ssp. cariensis (Boiss.) Upson& S. Andrews	Gece yanığı otu, yalancı lavanta	Leaves	8	Infusion	Scars
	Marrubium vulgare L.	Karaderme	Leaves	8	Decoction in milk	Ache treatment
	Melissa officinalis L.	Oğul otu, Melisa	Aerial parts	11,12, 14, 15	Infusion	Stomach, liver and heart diseases. Sedative effect
	Mentha longifolia L. ssp. thyphoides	İt nanesi	Aerial parts	13, 21, 22, 26 12	Infusion Fresh	Menstrual pains, cold, stomachache Toothache
	<i>Origanum sipyleum</i> L. (endemic)	Ak kekik	Aerial parts	1, 16, 18, 24	Decoction	Stomachache
	Origanum vulgare L. ssp. viride	Güvey otu, Kekik	Aerial parts	8,12	Infusion	Cold, sore throat, diaphoretic, diuretic
	Rosmarinus officinalis L.	Biberiye	Leaves	12	Infusion Maceration in olive oil	Kidney stones Headache
	Salvia tomentosa Mill.	Boşyaprak, Boşapla	Leaves	3, 5, 6, 7, 24, 25	Infusion	Analgesic and antipyretic in cold treatments
	Teucrium polium L.	Mayasıl otu, Tavuk otu	Aerial parts	10,13,14	Infusion	Constipation, diuretic, hemorrhoid
	<i>Thymus longicaulis</i> C. Presl ssp. <i>longicaulis</i>	Deli Kekik, Yabani kekik	Aerial parts	3, 9, 12, 24, 26	Infusion	Cold, sore throat
MALVACEAE	<i>Tilia argentea</i> Desf. ex DC.	Ihlamur, Lanbır	Leaves and flowers	9, 12, 21, 26	Infusion	Cold, sedative effect, cough, antipyretic
	Malva sylvestris L.	Ebegümeci	Leaves and flowers	4,5	Decoction	Sore throat, bronchitis, cough, stomachache and constipation
MORACEAE	Ficus carica L.	Yemiş, bardacık	Fruits	8	Fresh	Constipation
	Morus alba L.	Ak dut	Dried fruits	12	Decoction	Eczema
NITRARIACEAE	Peganum harmala L.	Bağıl otu, Üzerlik	Seeds	2, 5, 6	Infusion	Menstrual expectorant
PINACEAE	<i>Pinus brutia</i> Ten.	Türk çamı	Resine Leaves	13, 17	Salve Decoction	Rheumatism, cracked skin Cough, expectorant
POACEAE	<i>Cynodon dactylon</i> (L.) Pers. var. <i>villosus</i> Regel	Ayrık otu	Roots	18	Decoction	Hemorrhoid, liver fattening.
POLYGONACEAE	Rumex acetosella L.	Ekşi labada, küçük labada	Aerial parts	8	Decoction	Blood thinner
ROSACEAE	Rubus sanctus Schreb.	Diken çileği, yaban dutu	Roots and tillers	5,8	Fresh	Hemorrhoid and diabetes
	Rosa canina L.	İtburnu, gülburnu	Fruits	10,12,13, 21,22	Infusion	Cold disease, stomache
	Crataegus monogyna Jacq. var monogyna	Adi alıç, yemişen	Fruits	5,18	Decoction	Heart and vascular diseases and high tension
	<i>Prunus spinosa</i> L. ssp. <i>dasyphylla</i> (Schur) Domin	Güvem eriği	Fruits	18,20	Fresh	Kidney stones, diabetes and bronchitis
	Cerasus avium (L.) Moench	Yabani kiraz	Leaves and flowers Fruits	8	Decoction Fresh	Leaves have laxative effect, flowers for cough and fruits for constipation
	Pyrus eleagnifolia Pall. ssp. eleagnifolia	Yaban armudu, boz armut	Fruits	5,16	Fresh	Diarrhea
SANTHALACEAE	Viscum album L. ssp. album	Burç, çekem, gökçe ağacı	Leaves	13, 17	Decoction	Menstrual pains, prostate

FAMILY	Botanical name	Local name	Part used	Village number	Preparation	Ailments treated/ Therapeutic effect
SOLANACEAE	Datura stramonium L.	Tatala	Seeds	1	Fresh	Prostate
URTICACEAE	Urtica dioica L.	Dalayan diken, Gidişken otu,	Leaves	5	Decoction	Stomache and prostate
	Urtica urens L.	Isırganotu	Seeds	12	Fresh	Cancer

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The most used preparation methods of the remedies were infusion, decoction and fresh application. Some plants such as Matricaria chamomilla L., Hypericum perforatum L. and Rosmarinus officinalis L. were waited in olive oil for a while. On the other hand, it has been reported different preparation methods for example, leaves of Marrubium vulgare L. (Karaderme) were decoction in milk for ache treatments or roots of Drancunculus vulgaris Schott (Yılanyastığı) were roasted and powdered and then eaten after mixed with honey for treatment of hemorrhoid. The used plant parts were as follows; leaves (31,4%), aerial parts (20,3%), fruits (14,8%), flowers and flowering branches (12,9%), seeds (9,2%), roots (7,4%) and stem or wood (3,7%).

The comparison of the medicinal plants reported in this study with other ethnobotanical studies which

made in Bursa province (Bazaars of different districts, Yenisehir district), and its surroundings (Sile district from İstanbul province, Edremit Gulf, Havran, Burhaniye and Manyas districts from Balıkesir province) was given in Table 3. According to Table 3, Anethum graveolens L., Beta vulgaris var. vulgaris L., Brassica oleracea L., Chenopodium album L. ssp. album, Coriandrum sativum L., Cucumis melo L., Ferula communis L. ssp. communis, Origanum sipyleum L. and Rumex acetosella L. were only used in the study area. Ecballium elaterium (L.) A. Rich., Hypericum perforatum L., Malva sylvestris L. (M. neglecta Wallr. was cited in Manyas), Rosa canina L., Tilia argentea Desf. ex DC., Melissa officinalis L. (except for Silivri), Equisetum arvense L. (except for Edremit Gulf) and Ficus carica L. (except for Yalova) were the most frequently cited medicinal plants in the studies.

This study	Şanlı 2006	Koçyiğit & Özhatay 2006	Aktan 2011	Poyraz Kayabaşı 2011	Bulut 2011	Polat & Satıl 2012
Adianthum capillus-veneris L.	Cough, expectorant	diüretic	-	-	-	-
Anethum graveolens L.	-	_	_	-	_	-
Anthemis tinctoria L.	Cold, gastridis, ulcer	_	_	-	_	-
Beta vulgaris var. vulgaris L.	-	-	-	-	-	-
Brassica oleracea L.	-	_	_	-	_	-
Cerasus avium (L.) Moench	Diuretic, blood thinner	-	-	-	digestive	-
Chenopodium album L. ssp. album	-	-	-	-	-	-
Cistus laurifolius L.	-	-	-	_	-	diabetes
Cistus salviifolius L.	-	Urethra inflamation	-	-	-	Diabetes, hemostatic
Coriandrum sativum L.	_	_	_	_	_	_
Cornus mas L.	-	antidiarrhetic	antipyteric		diarrhea	Antihypertansive, diarrhea
Crataegus monogyna Jacq. var monogyna	-	cardiotonic	-	-	-	Cardiovascular diseases
Cucumis melo L.	-	-	-	-	-	-
<i>Cynodon dactylon</i> (L.) Pers. var. <i>villosus</i> Regel	Kidney diaseas, prostatis, diuretic	diuretic	Rheumatism	-	-	Kidney and gall stones
Datura stramonium L.	-	Asthma, wounds	-	_	-	asthma
Dracunculus vulgaris Schott	-	_	Hemorrhoid, skin cracks	-	-	Hemorrhoid, carminative for animal

Table 3. The comparison of the medicinal plants recorded in the ethnobotanical studies made in Bursa and its surroundings.

This study			Poyraz Kayabaşı 2011	Bulut 2011	Polat & Satıl 2012	
<i>Ecballium elaterium</i> (L.) A. Rich.	Flu, sinusitis, shortness of breath	Sinusitis, eczema	fever, sinusitis, hepatitis	sinusitis	Rheumatism, hepatitis, eczema	Sinusitis, rheumatism, hemorrhoid, eczema
Equisetum arvense	Stomach ache, hypertansive, sedative	diuretic	analgezic	Prostatis, kidney stones	Kidney Stones, stomach ache	-
Ferula communis L. ssp. communis	-	-	-			-
Ficus carica L.	Hemorrhoid, sedative	-	Kidney stones, warts, inflamation remover	Warts, enteritis	warts	Warts, bee and insect bites
Hypericum perforatum L.	Stomach ache, sedative, wounds	Stomach ache, wounds	Sedative, wounds, burns	Wounds, diabetes	Diabetes, stomach ache	Stomach ache, local pains, wounds, burns, enteritis
Juglans regia L.	-	-	Sinusitis, headache, toothache, diabetes	-	Wounds for animal	antifungal
Juniperus oxycedrus L.	rheumatism	bronchitis		Stomach ache, hemorrhoid	_	Cuts, wounds, hemorrhoid
Lavandula pedunculata ssp. cariensis	Heart and vascular diseases			Heart and vascular diseases	-	Stomach ache, headache, menstrual regulary
Malva sylvestris L.	Cough, flu, bronchitis	Bronchitis, wounds	Cough, rheumatism, bowel inflamation	asthma	Stomatic, hemorrhoids, intestinal diseases	Abdominal pain
Marrubium vulgare L. Matricaria chamomilla L.	– Sedative, carminative	-	-	– – Cough, sore		carminative –
Melissa officinalis L.	Sedative	Sedative	Sedative	diabetes	throat –	Cold, flu, stomach ache, sedative, cardiovascular diseases
Mentha longifolia L. ssp. thyphoides	-	Cough, wounds	-	-	-	Stomach ache
Morus alba L.	-	_	-	-	Oral candidiasis for babies	-
Origanum sipyleum L. Origanum vulgare L. ssp. viride	-	– Hemorrhoid, hepatitis, toothache, stomach ache, diabetes, digestive	– Stomach ache, vein opener	– – – Cold, diabetes –		– Cold, flu, toothache, headache
Peganum harmala L.	-	-	-	_	-	hemorrhoid
Pistacia terebinthus	-	-	-	-	Abdominal pain, Ithching	_
<i>Pinus brutia</i> Ten.	-	_	-			Stomach ache, ulcer, wounds, cuts
<i>Prunus spinosa</i> L. ssp. dasyphylla	Diarrhea, diuretic	-	-	-	diabetes	-

## Table 3. Continuation.

#### Table 3. Continuation.

This study	Şanlı 2006	Koçyiğit & Özhatay 2006	Aktan 2011	Poyraz Kayabaşı 2011	Bulut 2011	Polat & Satıl 2012
<i>Pyrus eleagnifolia</i> Pall. ssp. <i>eleagnifolia</i>	-	-	_	diabetes	_	-
Rosmarinus officinalis	Loosing weight, bronchitis	-	-	-	-	Cold, flu, migraine, carminative
Rosa canina L.	Cough, flu, bronchitis	cold	Sedative, laxative	cold Cold, diarrhea, stomach ache		Cold, flu, cough, diabetes
Rubus sanctus Schreb.	-	Heath bone, hemostatic	-	-	Cough, diabetes	Pneumonia, prostatis
Rumex acetosella L.	_	_	_	_	_	_
Salvia tomentosa Mill.	-	-	Lung and liver diseases	Sore throat, cold	-	Cold, flu, tonsilitis
Sinapis arvensis L.	_	_	-	-	-	diabetes
Teucrium polium L.	Stomach ache, hemorrhoid, eczema	eczema	-	-	hemorrhoid	Diabetes, kidney stones
<i>Tilia argentea</i> Desf. ex DC.	Sedative, cough, flu, bronchitis	expectorant	Cold, flu, bronchitis	Cold, flu, cough	Cold, sore throat	Cold, flu, cough
<i>Thymus longicaulis</i> C. Presl ssp. <i>longicaulis</i>	diabetes	Stomach ache, asthma	-	-	toothache	Cold, flu, abdominal pain
Urtica dioica L.	Kidney diseases, diuretic	Expectorant, bronchitis	-	Local pains Hemorrhoi cancer, rheumatisr diuretic, stomach acl		Cancer, hemorrhoid, baldness
Urtica urensL.	-	-	-	Immunity enhancer	Hemorrhoid, cancer, rheumatism, diuretic, stomach ache	-
Viscum album L. ssp. album	-	-	Rheumatism, vein opener, diabetes	Gynecological diseases	-	Cancer

When compared the results of this study show similarities with the findings of the studies conducted from nearby areas. It has been reported that *Ecballium elaterium*, *Hypericum perforatum*, *Teucrium polium* L., *Tilia argentea*, *Melissa officinalis* are used in the treatment of similar ailments while *Cistus laurifolius* L., *C. salviifolius* L., *Lavandula pedunculata* (Mill) Cav. ssp. *cariensis* (Boiss.) Upson & S. Andrews *Morus alba L*, *Peganum harmala L.*, *Pistacia terebinthus L*. and *Sinapis arvensis* L. have different uses in the study area than the other areas.

In order to cure diseases using plants is natural, healty cheap and easy for the people living in rural areas. Orhaneli and Büyükorhan districts are located in mountainious area of the Bursa therefore medical use of plants by local people is more common. The ethnobotanical and folk medicinal studies are very important and useful for both transmission of traditional knowledge about medicinal plants from older generations to new ones and discovery or development of new drugs. This study will be helped to record traditional information in the study area.

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