



A floristic study on some natural and cultural sites of Adana (Türkiye) province

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Adana (Türkiye) ilinin bazı doğal ve kültürel sit alanları üzerine floristik bir çalışma

Abstract: This study was carried out between 2014-2016 to investigate the plant cover of seven localities (Ağyatan, Tuzla and Yumurtalık Lagoons, Yer Köprü Natural Formation, Akyatan Lagoon, Şekerpınar, Tatarlı Village Ancient Period Ruins) having cultural and natural site within the borders of Adana province in Eastern Mediterranean Region (Türkiye). As a result 219 taxa belong to 70 families and 180 genera were identified. Among them, 18 were determined in Ağyatan Lagoon, 41 in Tuzla Lagoon, 83 in Yumurtalık Lagoon, 13 in Akyatan Lagoon, 55 in Yer Köprü Natural Formation, 56 in Şekerpınar and 48 in Tatarlı Village Ancient Period Ruins. Eight of these taxa are endemic, and seven are in the critical species category.

Key words: Natural Site, Cultural Site, Flora, Adana, Turkey

Özet: Bu çalışma 2014-2016 yılları arasında Türkiye'nin Doğu Akdeniz Bölgesinde yer alan Adana ili sınırları içinde bulunan ve doğal ve kültürel sit özelliği taşıyan 7 lokalitenin (Ağyatan, Tuzla ve Yumurtalık Lagünleri, Yer Köprü Doğal Oluşumu, Akyatan Gölü, Şekerpınarı ve Tatarlı Köyü Antik Dönem Kalıntıları) bitki örtüsünü araştırmak amacıyla gerçekleştirilmiştir. Sonuçta 70 familya ve 180 cinse ait 219 takson tespit edilmiştir. Bunlardan 18 tanesi Ağyatan Lagününde, 41 tanesi Tuzla Lagününde, 83 tanesi Yumurtalık Lagününde, 13 tanesi Akyatan Lagününde, 55 tanesi Yer Köprü Doğal Oluşumunda, 56 tanesi Şekerpınar'ında 56 ve 48 tanesi de Tatarlı Köyü Antik Dönem Kalıntılarında tespit edilmiştir. Bu taksonların 8'i endemik, 7'si kritik tür kategorisindedir.

Anahtar Kelimeler: Doğal Sit, Kültürel Sit, Flora, Adana, Türkiye

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1. Introduction

Turkey has a rich plant diversity. The country has a crucial flora region in terms of geographic location, characteristics of plant geography, climate and edaphic differences, endemic plant diversity, and floristic area of the World (Davis, 1965-1985; Davis and Hedge, 1975). This study aims to investigate the floristic feature of natural and cultural sites located in Adana province, a part of the eastern Mediterranean region of Turkey. The research includes the site areas Ağyatan Lagoon, Tuzla Lagoon, Yumurtalık Lagoon, Yer Köprü Natural Formation, Akyatan Lagoon, Şekerpınar and Tatarlı Village Antic Ruins.

Phytogeographically Adana province is located in the East Mediterranean region. The research area is located in C5 according to Davis' grid-square system and have a rich and unique place in terms of plant diversity. This is due to the fact that Turkey has three different climates, landforms and rich plant diversity (Davis, 1965-1985; Davis and Hedge, 1975).

The first studies on the Flora of Turkey were carried out by Tournefort in the 1700s. Boissier carried out the first major study on the Flora of Türkiye between 1865-1888 and published "Flora Orientalis" (Boissier, 1867-1888).

Turkish plants have mainly been investigated by P.H. Davis between 1965-1985 and published in 9 volumes with the name "Flora of Turkey and the East Aegean Islands". It has revealed our country's Flora with the contribution of many researchers under that day's conditions and became the primary source for floristic studies. After the publication of this Flora in 1965-1985, with the identification new taxa and carried out revisions have been published of the Flora of Turkey volume 10 in 1988 by Davis et al. (1988). Between 1988 and 2000, a study containing additional taxa for Flora of Turkey was published. During this period, many publications are related to the taxa in Turkey that were identified for the first time or brand new for science. (Güner et al., 2000). Later on, Güner et al. (2000) added the 11th volume to Flora of Turkey and East Aegean Islands.

Meanwhile, many studies have been published regarding Turkey's Flora by researchers after the publication of additional volumes (Özhatay and Kültür, 2006; Özhatay, et al., 2009, 2011, 2013, 2015, 2017). This study again analyzes the number of taxa in Flora of Turkey, and 295 taxa (239 species and 56 subspecies) are added. In this way, the total number of taxa has reached 12301, and 163 species, eight subspecies, and 14 varieties are added as endemic. Ekim et al. (2000) and Erik and Tarikahya (2004) give the total endemic taxa of Türkiye as 3963 (32.2%).

The list of vascular plants of Türkiye was published in 2012. According to this list, the total number of plant taxa of the Flora of Türkiye is given as 11707, 3649 of these taxa were defined as endemic and the endemism rate was determined as 31.82% (Güner et al., 2012). Today, the preparation of the Illustrated Flora of Türkiye continues and the first three volumes have been published (Güner et al., 2014; Güner et al., 2018; Güner et al., 2022).

Similar floristic studies were carried out in Yumurtalık Lagoon (Altınözlü, 2004), Akdağ and surroundings (Akıncı et al., 2018), Sarımsak Mountain and Korkun Valley (Paksoy and Savran, 2011), Kızıldağ Plateau and its surroundings (Keskin and Savran, 2020) and Karatepe-Aslantaş National Park, Harun Reşit Castle, Haruniye Thermal Springs and Şarлак Waterfall (Tel et al., 2019). In these studies, 234 taxa belonging to 186 genera, and 65 families are identified from Adana Yumurtalık Lagoon. Three endemic plant taxa are identified. The endemism rate is 3.1% (Altınözlü, 2004). Two hundred twenty-nine taxa belonging to 147 genera, and 45 families were identified from Burnaz Dunes, seven of which are endemic. Seven hundred thirty-nine taxa belonging to 362 genera, and 88 families were identified from Akdağ and its surroundings, 100 of which are endemic with an endemism rate of 13.6% (Akıncı, et al., 2018). Six hundred and fifty-two taxa belonging to 315 genera, and 78 families were identified from Sarımsak mountain and Korkun Valley. Among them 135 taxa are endemic with an endemism rate of 20.7% (Paksoy and Savran, 2011). Forty-nine taxa belonging to 110 genera, and 38 families were identified from Tatarlı Höyük with three endemic taxa and 2% endemism rate (Kavak et al., 2012). Five hundred seventy-four taxa belonging to 285 genera, and 75 families were identified from Kızıldağ Plateau and its surroundings. Among them 97 are endemic and the endemism rate is 16.8% (Keskin and Savran, 2020). One hundred sixty-four taxa belonging to 59 families, 139 genera, 135 species, 23 subspecies and six varieties, and were identified in the Karatepe-Aslantaş National Park, which is nearly a natural protected area (Tel et al., 2019).

Here we present the flora of the Ağyatan, Tuzla and Yumurtalık Lagoons, Akyatan Lagoon, the Yer Köprü Natural Formation, Şekerpinar and Tatarlı Village Ancient Period Ruins in Adana.

2. Material and Method

The investigation materials were 313 plant specimens collected from the research area between 2014-2016. During this period, 12 field studies were carried out. The voucher numbers of the collected plant specimens are given in Appendix-1. The plant specimens were dried in accordance with herbarium techniques and identified using the Flora of Turkey (Davis, 1965-1985; Güner et al., 2000). Some plant identifications were made by experts (Ahmet İLÇİM and Ergün ÖZUSLU). The collected and dried plant specimens have been deposited at the Herbarium of Adıyaman University. IUCN risk categories of threatened taxa were also traced from the relevant literature (Ekim et al., 2000, 2014; The IUCN Red List of Threatened Species [version 2021-1] (2021); Güner et al., 2012; John and Türk, 2017; Erdağ and Kürschner, 2017). The phytogeographic regions of the taxa are evaluated according to Davis (1965-1985) and Davis et al. (1988). The plant names are checked using Turkey Plants List: Vascular Plants (Güner et al.,

2012), The International Plant Names Index (2022), Turkey Plant List (2022) and The Plant List (2022). The abbreviations used in the text and the floristic list are as follows: CR: Critically endangered; EN: Endangered; LC: Least concern; NT: Near threatened; VU: Vulnerable, DD: Data deficient. The floristic list is given in Appendix-1. Endemic and rare plants list have given alphabetically.

The study areas are numbered and shown in Figure 1, and the coordinate and general properties were given in Table 1 as [1] Ağyatan Lagoon, [2] Tuzla Lagoon, [3] Yumurtalık Lagoon, [4] Akyatan Lagoon, [5] Yer Köprü Natural Formation, [6] Şekerpinar Historical Bridge, [7] Tatarlı Village Ancient Period Ruins.



Figure 1: Research Areas (adopted from wikipedia)

3. Results

General characteristics of the research areas, investigated in this study, were given in Table 1. Among them, Ağyatan Lagoon is located in Karataş district of Adana province. It is a typical lagoon consisting of alluvium formed by delta sediments and dunes with the change of bed of Seyhan river. It is a first degree natural site. It is also protected as a wetland. Natural landscape elements are the sea, beach, dunes, Dalyan region, and Ağyatan lake. The area has some sand dunes between the lake and the sea, which has a flat land structure in terms of geomorphology. The surface area of it is 6.514.102,68 m². This lagoon shrinks significantly during the summer, and vast mud flats appear. The lake is connected to the sea by a canal from the southwest. In periods when lake water level are high, water flows from the lake to the sea through the canal and from the sea to the lake in the low periods. With the effect of rainfall and water carried by drainage channels in winter and spring, the lake water becomes sweeter. In summer, salinity increases due

Table 1. The study areas and general characteristics

Study area	Surface area (m ²)	Coordinates	Altitude (m)
Ağyatan Lagoon	6.514.102,68	36°39'37.67" N - 35°17'06.25" E	1
Tuzla Lagoon	17.460.549,73	36°42'32.88" N - 35°03'20.56" E	1
Yumurtalık Lagoon	90.208.440,02	36°41'38.59" N - 35°33'14.37" E	1
Akyatan Lagoon	83.796.264,3	36°38'23.81" N - 35°15'57.17" E	1
Yer Köprü Natural Formation	20.775,67	37°40'56.04" N - 35°29'34.83" E	771
Şekerpınar	31.671,49	37°28'18.48" N - 34°51'42.63" E	834
Tatarlı Village Antique Period Ruins	6.653,85	37°07'24.90" N - 36°03'20.12" E	37

to high evaporation and water ingress from the sea to the lake. The average annual rainfall of the research area is 769,9 mm. Average maximum and minimum temperatures respectively are 27,36 °C and 10 °C in August and May respectively. The climate diagram of Karataş district, where Ağyatan, Tuzla, Yumurtalık, and Akyatan lagoons take place, is given in Figure 2. The taxa identified from the natural site area are given in Appendix 1. Eighteen plant taxa have been identified in the Ağyatan Lagoon. Among these taxa, *Pancreatium maritimum* L. (Sand Lily) is a rare taxon and is in the VU category.

Tuzla Lagoon is also located in Karataş district of Adana province. This area is a first degree natural protected area and wildlife development area. It is a wetland, and the area is under protection. The size of Tuzla Lagoon is 17.460.549,73 m². The area is located in the southern part of the Çukurova Delta, where the Seyhan and Ceyhan rivers flow into the Mediterranean. There is a Salt Lake close to the sea and an inner lake. Tuzla lake is filled with precipitation in winter and dries up in summer. It has a saltwater habitat. The area has a coastline of approximately 15.5 km and generally shows a natural landscape feature. It has a flat land structure geomorphologically. There are dunes between the lake and the sea. Identified taxa from Tuzla Lagoon are given in Appendix 1. Forty-two plant taxa have been identified in the area. There is one taxon that is critical species in the research area. This taxon is not endemic. *Pancreatium maritimum* L. (Sand lily) is a rare taxon in the VU category.

Yumurtalık Lagoon is located in Karataş and Yumurtalık districts of Adana province. It is a natural site and Turkey's eleventh Ramsar area. It is also a nature protection area with a surface area of 90.208.440,02 m². Yumurtalık Lagoon is a natural distribution area of the rare species (*Pinus halepensis* Mill.). The area contains tree, shrub, and a grass vegetation layers. It has a flat land structure geomorphologically, and has no elevation around it. Eighty-seven plant taxa have been identified in the area (Appendix 1). Two of the identified taxa in the area (*Echinops dumanii* C. Vural (CR) and *Pancreatium maritimum* L. (Sand lily) (VU)) have critical importance. In a previous study, Altınözülü (2004) presented 234 species belonging to 186 genera and 65 families from the area. Among which 223 are naturally growing species while 11 are cultivated plants. The rate of endemism is low with 3 (1.3%) endemic species, *Polygonum praelongum* Coode & Cullen (EN), *Centaurea calcitrapa* ssp. *cilicica* (Boiss. & Balansa) Wagenitz (LC), *Tripleurospermum conoclinium* (Boiss. & Honey) Hayek (LC).

Akyatan Lagoon is another research area, located in Karataş district of Adana. The area is a first and second degree

natural site area. The area is also a wildlife development area. Akyatan Lake has a special topography due to its alluvial structures. This lake is the largest lagoon lake formed by the Seyhan and Ceyhan rivers in the Çukurova delta. The area has a coastline of approximately 20 km. Identified flora taxa from Akyatan Lake Natural Protected Area are given in Appendix 1. Thirteen plant taxa have been identified in this area without any critical species.

Yer Köprü Natural Formation is located in Aladağ district of Adana province. The area is also a first degree natural site area. The area is also a wetland and is under protection. Yer Köprü Natural Formation covers a surface area of 20.775,67 m². The area and its surroundings are located in a valley. Altitude of the area is 500 m at the bottom of the valley. Identified flora taxa in the area are given in Appendix 1. Fifty-five taxa have been identified in the area. There are three endemic taxa in the field, which are *Mattiastrum calycinum* (Boiss. & Balansa) Brand (LC), *Alkanna hispida* Hub. - Mor. (EN) and *Centaurea chrysantha* Wagenitz - (EN).

Şekerpınar is located in Pozantı district of Adana province. The area is a second degree natural site area with a surface area of 31.671,49 m². In addition, the area is a wetland. There are cultivated plants around the facility area, and oak species (*Quercus* spp.) are sparsely spread in the upper parts. The area and its surroundings were transformed into a cultural landscape with an anthropogenic effect. Accommodation facilities, pipelines passing through the area, and road and railway transportation networks have caused changes in the natural landscape. The area has a geomorphologically active land structure between a valley with a steep slope. Though the area has a forest character, it has lost this characteristic to a great extent, due to anthropogenic effects. The area and its surroundings have an altitude of approximately 850-900 meters. Fifty-seven plant taxa were identified in Şekerpınar, three of which are endemic (Appendix 1).

Tatarlı Village Antique Period Ruins is located in the Ceyhan district of Adana. It is a first degree natural and archaeological site. It has a surface area of 6.653,85 m². The area contains tree, shrub, and a grass vegetation layer. This wetland is also a residential area. The area consists of flat plains with an altitude of about 40 meters. Identified taxa from the area are given in Appendix 1. Forty-eight plant taxa were identified in the area. There are no critical species in the area. The climate diagram of the area is shown in Figure 3.

4. Discussions

This study was carried out in seven localities within Adana province, and 219 taxa belonging to 70 families and 180

genera were determined (Appendix 1). The allocation of taxa according to phytogeographical regions are follows: Mediterranean (including East Mediterranean) 76 (34,6%), Euro-Siberian 10 (4,5%), Irano-Turanian 11 (5%), multi-regional 11 (5%), unknown phytogeographic origin 76 (35%) (Table 2). The majority of the determined taxa are Mediterranean phytogeographical elements. This is a natural result of the fact that all of the investigated areas are in this region. The presence of Euro-Siberian and Irano-Turanian elements is due to the microclimates existing in the study area. Eight of the determined taxa are endemic, and four are in rare category (Table 3). The endemism rate is 3,65% and includes 8 endemic taxa in the research area. Phytogeographic distribution of the endemic taxa are as follows: 3 taxa Mediterranean, one taxon Irano-Turanian, and four taxa unknown. Endemic taxa were evaluated according to IUCN risk categories (Ekim et al., 2000; The IUCN Red List of Threatened Species (version 2021-1), 2021). 1 CR (Critically endangered), 2 VU (Vulnerable), 2 EN (Endangered) and 3 LC (Least concern).

Table 2. Distribution of the taxa detected in the study area according to phytogeographic regions

Phytogeographic region	# of taxa	Rate (%)
Mediterranean	76	34,6
Euro-Siberian	10	4,5
Irano-Turanian	11	5
Multi regional	46	20,9
Unknown	76	35
Total	219	100

Table 3. The number of families, taxa, endemic taxa and the rate of endemism in the study areas.

Study area	Family	Taxa	# of end. taxa	End. Rate (%)
Ağyatan Lagoon	14	18	-	0
Tuzla Lagoon	27	41	-	0
Yumurtalık Lagoon	39	83	1	2.4
Akyatan Lagoon	12	13	-	0
Yer Köprü Natural Formation	39	55	3	1.3
Şekerpınar	32	57	3	1.3
Tatarlı Village Antique Period Ruins	14	18	-	0

is as follows: 24 taxa are Mediterranean, 11 are East Mediterranean, four are Irano-Turanian, one is Euro-Siberian, 15 are multi-regional, and three taxa are unknown. The situation is a relevant result in terms of phytogeography. Among the determined taxa, one, *Echinops dumanii* C. Vural, is endemic, and three, *Pinus brutia* Ten., *Pancreatium maritimum* L. and *Dianthus polycladus* Boiss, are in vulnerable "VU" category (Table 5). Altınözlü (2004) presented 234 taxa belonging to 65 families and 186 genera from Yumurtalık Lagoon Nature Protection Area with an endemism rate of 1.3%. The endemic taxa presented in Altınözlü (2004) are *Polygonum praelongum* Coode & Cullen (EN), *Centaurea calcitrapa* ssp. *cilicica* (Boiss. & Balansa) Wagenitz (LC), *Tripleurospermum conoclinium* (Boiss. & Bal) Hayek (LC). Current literature include a total of 7 taxa in Turkey Plants Red List from the region. Those non endemic ones are *Helianthemum stipulatum* (Forssk.) C.Ch. (VU), *Zygophyllum album* L. (VU), *Pancreatium maritimum* L.

Number of determined taxa, their distribution to the families (Table 4), phytogeographical distributions, endemism rate, and IUCN red data categories were also evaluated separately.

In Ağyatan Lagoon, 18 taxa were identified. Most crowded families in the region are *Juncaceae*, *Asteraceae* and *Chenopodiaceae* each with two taxa. Two of the determined taxa are Mediterranean, two are East Mediterranean, one Irano-Turanian elements while three are multi-regional and ten taxa unknown. None of the determined taxa are endemic, but *Pancreatium maritimum* L. taxon is in VU category (Table 5).

Forty-one taxa belong to 27 families, and 36 genera were identified in Tuzla Lagoon (Appendix 1). *Fabaceae* and *Asteraceae* were found to be the most crowded families in the region each with 5 taxa. They are followed by *Poaceae* with 3 taxa (Table 4). Eleven of the determined taxa are Mediterranean, five are East Mediterranean elements, while one of them is a cultivated plant, 7 taxa multi-regional, and 17 taxa unknown. This situation can be explained by the fact that the research area falls in the Mediterranean region phytogeographical region within the holarctic floral kingdom. There are no endemic plants in our study area. Two of the them, *Pancreatium maritimum* L. and *Zygophyllum album* L., are in VU category (Table 5).

Eighty three taxa were determined in Yumurtalık Lagoon (Appendix 1). In the study area, the wealthiest families regarding the number of taxa are *Fabaceae* (10), *Asteraceae* (8), and *Chenopodiaceae* (6). The first three families with the most genera and their ratios are given Table 4. Distribution of taxa in phytogeographical regions

(EN), and *Heliotropium ovalifolium* Forssk. (CR) (Ekim et al., 2000).

Thirteen taxa were identified in Akyatan Lagoon (Appendix 1). The most crowded families in the region are *Pinaceae*, *Poaceae* and *Verbanaceae* each with 2 taxa (Table 4). Among the determined taxa, 3 are Mediterranean elements, four are East Mediterranean elements while two taxa are multi-regional and four unknown. There is no Irano-Turanian element in the region. This results are also thought to be related with the phytogeography of the region. No endemic species were determined in the region, but *Pinus brutia* Ten. is in vulnerable "VU" category.

Fifty-five taxa belonging to 39 families, and 53 genera were identified in Yer Köprü Natural Formation (Appendix 1). Here the most crowded family was found to be *Asteraceae* with 7 taxa. It is followed by *Lamiaceae* and *Oleaceae* each with 3 taxa (Table 5). The phytogeographic distribution of the taxa determined in Yer Köprü Natural Formation is as follows: 14 taxa are Mediterranean, 10 are East

Table 4. Comparison of families with the most taxa and genus among the study areas

Study area	The most taxa containing family			The most genera containing family		
	Family	# of taxa	Rate (%)	Family	# of genera	Rate (%)
1 Ağyatan Lagoon	<i>Juncaceae</i>	2	11,11	<i>Asteraceae</i>	2	11,76
	<i>Asteraceae</i>	2	11,11	<i>Boraginaceae</i>	2	11,76
	<i>Chenopodiaceae</i>	2	11,11	<i>Chenopodiaceae</i>	2	11,76
	Others	12	66,66	Others	11	64,70
2 Tuzla Lagoon	<i>Fabaceae</i>	5	11,90	<i>Fabaceae</i>	4	11,11
	<i>Asteraceae</i>	5	11,90	<i>Asteraceae</i>	4	11,11
	<i>Poaceae</i>	3	7,14	<i>Poaceae</i>	3	8,33
	Others	28	69,04	Others	25	69,44
3 Yumurtalık Lagoon	<i>Fabaceae</i>	10	11,62	<i>Fabaceae</i>	9	12,16
	<i>Asteraceae</i>	8	9,30	<i>Asteraceae</i>	7	9,45
	<i>Chenopodiaceae</i>	6	6,97	<i>Chenopodiaceae</i>	6	8,10
	Others	63	72,09	Others	52	70,27
4 Akyatan Lagoon	<i>Pinaceae</i>	2	15,38	<i>Pinaceae</i>	2	16,66
	<i>Poaceae</i>	2	15,38	<i>Poaceae</i>	2	16,66
	<i>Verbanaceae</i>	2	15,38	<i>Verbanaceae</i>	2	16,66
	Others	7	53,84	Others	6	50,00
5 Yer Köprü Natural Formation	<i>Asteraceae</i>	7	12,72	<i>Asteraceae</i>	7	13,20
	<i>Lamiaceae</i>	3	5,45	<i>Lamiaceae</i>	3	5,66
	<i>Oleaceae</i>	3	5,45	<i>Oleaceae</i>	3	5,66
	Others	42	76,36	Others	40	75,47
6 Şekerpinar	<i>Lamiaceae</i>	7	12,28	<i>Lamiaceae</i>	4	7,84
	<i>Asteraceae</i>	5	8,77	<i>Asteraceae</i>	5	9,80
	<i>Liliaceae</i>	3	5,26	<i>Liliaceae</i>	3	5,88
	Others	42	73,68	Others	39	76,47
7 Tatarlı Village Antique Period Ruins	<i>Asteraceae</i>	6	12,50	<i>Asteraceae</i>	6	12,24
	<i>Brassicaceae</i>	4	8,33	<i>Brassicaceae</i>	4	8,16
	<i>Scrophulariaceae</i>	4	8,33	<i>Scrophulariaceae</i>	3	6,12
	Others	34	70,83	Others	36	73,46

Table 5. Endemic and non-endemic (rare) taxa in the study area

Family	Taxa	Phytogeographic region	Endemism	IUCN category
<i>Asteraceae</i>	<i>Echinops dumanii</i> C. Vural	Med. Elm.	End.	CR
<i>Asteraceae</i>	<i>Centaurea chrysantha</i> Wagenitz	-	End.	EN
<i>Boraginaceae</i>	<i>Alkanna hispida</i> Hub.-Mor.	E. Med. Elm.	End.	EN
<i>Boraginaceae</i>	<i>Paracaryum calycinum</i> Boiss. & Balansa	Ir.-Tur. Elm	End.	LC
<i>Lamiaceae</i>	<i>Salvia aucheri</i> Benth.	-	End.	VU
<i>Lamiaceae</i>	<i>Salvia cilicica</i> Boiss. & Kotschy	-	End.	VU
<i>Lamiaceae</i>	<i>Stachys rupestris</i> Montbret & Aucher ex Benth.	E. Med. Elm	End.	LC
<i>Amaryllidaceae</i>	<i>Pancratium maritimum</i> L.	Med. Elm.	-	EN
<i>Zygophyllaceae</i>	<i>Zygophyllum album</i> L.	-	-	VU
<i>Pinaceae</i>	<i>Pinus halepensis</i> Mill.	Med Elm.	-	VU
<i>Caryophyllaceae</i>	<i>Dianthus polycladus</i> Boiss.	E. Med. Elm.	-	VU

Mediterranean, 2 are Irano-Turanian, 4 are Euro-Siberian, 9 taxa are multi-regional, and 16 taxa are unknown. Three of the taxa were determined to be endemic, (*Centaurea chrysantha* Wagenitz, *Alkanna hispida* Hub.-Mor., *Mattiastrum calycinum* (Boiss. & Balansa) Brand. Non-endemic *Pinus brutia* Ten., which is in VU category also exist in the region (Table 5).

Fifty-six taxa were determined in Şekerpinar (Appendix 1), four of which are endemic, *Salvia cilicica* Boiss. & Kotschy (VU), *Salvia aucheri* Benth var. *aucheri* (VU),

Teucrium chamaedrys L. subsp. *tauricum* Rech. fil. (LC), *Stachys rupestris* Montbret & Aucher ex Benth (LC). In the region *Lamiaceae* was the most crowded family and represented with 7 taxa. Second crowded family was *Asteraceae* with 5 taxa, and the third crowded one is *Liliaceae* with 3 taxa (Table 4). Phytogeographically, six of the determined taxa are Mediterranean elements, 13 are Eastern Mediterranean, four are Irano-Turanian, two are Euro-Siberian, 12 taxa are multi-regional and 20 taxa are unknown.

Forty-eight taxa belonging to 34 families and 49 genera were identified in Tatarlı Village Antique Period Ruins. Here, *Asteraceae* is the richest family with 6 taxa in terms of existing taxa number. It is followed by *Brassicaceae* and *Scrophulariaceae* families each with 4 taxa (Table 4). Distribution of taxa in phytogeographical regions are as follows: 8 taxa are Mediterranean, 4 taxa are East Mediterranean, 5 taxa are Euro-Siberian, 13 taxa are multi-regional and 18 taxa unknown. This distribution is consistent with the phytogeography of the area. *Pinus brutia* Ten., also exist in this region as being in VU category (Table 5).

The distribution ratio of phytogeographic elements of the study area is compared with the results of other investigations in nearby areas. Except Sarımsak Mountain and Korkun Valley, in all of the research areas, Mediterranean elements are the most crowded ones (Altınözlü, 2004; Akıncı et al., 2018; Paksoy, & Savran, 2011; Kavak et al., 2012; T.C. Ministry of Forestry and Water Affairs, 2013; Keskin & Savran, 2020; Tel et al., 2019). This situation can be explained by the fact that these areas are all in the Mediterranean region (Table 6).

The distribution of the determined taxa, as a whole, to the families were also compared with the findings of the

neighbouring studies (Table 7). In general, in all of the research areas *Asteraceae* were found to be the most crowded family except those carried out in Yumurtalık Lagoon, Karatepe-Aslantaş National Park where *Fabaceae* family was found as the first family in terms of taxa number. This situation is an expected result according to Davis (1965-1985).

Conflict of Interest

The authors have declared no conflict of interest.

Authors' Contribution

The authors contributed equally.

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Table 6. Distribution rates of taxa in the study area and close regions according to phytogeographic regions (%)

Study area	Med.	Eu.-Sib.	Ir.-Tur.	Wide
This study	34,6	10	11	20,9
Adana Yumurtalık Lagoon (Altınözlü, 2004)	17,4	2,6	2,6	77,1
Akdağ and its Surroundings (Akıncı et al., 2018)	19,4	5,1	16,9	58,6
Sarımsak Mountain and Korkun Valley (Paksoy and Savran, 2011)	18,9	3,45	24,6	53,05
Kızıldağ Plateau and Its Surroundings (Keskin and Savran, 2020)	18,8	4,1	17,2	59,9
Karatepe-Aslantaş National Park (Tel et al., 2019)	38,4	6,1	4,3	51,2

Table 7. Families containing the most taxa in studies conducted in the research area and its close regions

Study area	<i>Asteraceae</i>	<i>Fabaceae</i>	<i>Lamiaceae</i>	<i>Brassicaceae</i>
This study	24	19	14	8
Adana Yumurtalık Lagoon (Altınözlü, 2004)	26	41	7	6
Akdağ and its Surroundings (Akıncı et al., 2018)	97	72	53	61
Sarımsak Mountain and Korkun Valley (Paksoy and Savran, 2011)	82	70	46	51
Kızıldağ Plateau and Its Surroundings (Keskin and Savran, 2020)	67	55	44	54
Karatepe-Aslantaş National Park (Tel et al., 2019)	13	26	13	7

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Appendix 1. Taxa list of study area

Family	Taxon	Phytogeographic region	IUCN category	Speread situation	Area	Collection date	Collection No
1	<i>Adiantaceae</i>	<i>Adiantum capillus-veneris</i> L.	Widespread	-	Wide	5,7	08.05.2016 Ortaç 1000
2	<i>Aspleniaceae</i>	<i>Ceterach officinarum</i> DC.	-	-	Wide	6	03.04.2016 Ortaç 1001
3	<i>Ephadraceae</i>	<i>Ephedra foeminea</i> Forssk.	-	-	Wide	6	03.04.2016 Ortaç 1008
4	<i>Cupresaceae</i>	<i>Cupressus sempervirens</i> L.	-	-	Regional	5,6	03.04.2016 Ortaç 1004
5	<i>Cupresaceae</i>	<i>Juniperus drupacea</i> Lab.	-	-	Bölgesel	6	03.04.2016 Ortaç 1005
6	<i>Cupresaceae</i>	<i>Juniperus oxycedrus</i> L.	Widespread	-	Wide	6	03.04.2016 Ortaç 1007
7	<i>Pinaceae</i>	<i>Pinus brutia</i> Ten.	E. Med. Reg.	VU	Regional	3,4,5,6,7	07.04.2016 Ortaç 1011
8	<i>Pinaceae</i>	<i>Pinus halepensis</i> Mill.	E. Med. Reg.	VU	Narrow	3	08.05.2016 Ortaç 1012
9	<i>Pinaceae</i>	<i>Pinus nigra</i> Arn. subsp. <i>pallasiana</i> (Lamb.) Holmboe	-	-	Wide	6	03.04.2016 Ortaç 1013
10	<i>Pinaceae</i>	<i>Pinus pinea</i> L.	Widespread	-	Regional	4	07.04.2016 Ortaç 1014
11	<i>Amaryllidaceae</i>	<i>Pancreatium maritimum</i> L.	Mediterranean	EN	Regional	1,2,3	22.07.2016 Ortaç 1424
12	<i>Anacardiaceae</i>	<i>Pistacia palaestina</i> Boiss.	E. Med. Reg.	-	Regional	2,3,5,6	07.04.2016 Ortaç 1017

13	Apiaceae	<i>Eryngium campestre</i> L. var. <i>virens</i> Link	Widespread	-	Regional	6	03.04.2016	Ortaç 1021
14	Apiaceae	<i>Eryngium maritimum</i> L.		-	Wide	2	07.04.2016	Ortaç 1023
15	Apiaceae	<i>Turgenia latifolia</i> (L.) Hoffm.	Widespread	-	Wide	2	07.04.2016	Ortaç 1025
16	Apocynaceae	<i>Nerium oleander</i> L.	Mediterranean	-	Regional	3,5	08.05.2016	Ortaç 1026
17	Apocynaceae	<i>Trachomitum venetum</i> (L.) Woodson subsp. <i>sarmatiense</i> (Woodson) Avetisian	E. Med. Reg.	-	Wide	2,3,4	07.04.2016	Ortaç 1027
18	Araceae	<i>Arum dioscoridis</i> Sm.	E. Med. Reg.	-	Wide	6,7	03.04.2016	Ortaç 1425
19	Araliaceae	<i>Hedera helix</i> L.		-	Wide	5,6,7	03.04.2016	Ortaç 1028
20	Asclepiaceae	<i>Cionura erecta</i> (L.) Griseb.	E. Med. Reg.	-	Wide	2,4	07.04.2016	Ortaç 1031
21	Asclepiaceae	<i>Vincetoxicum canescens</i> (Willd.) Decne.		-	Wide	5	22.07.2016	Ortaç 1032
22	Asteraceae	<i>Anthemis tinctoria</i> L.	Widespread	-	Wide	5	22.07.2016	Ortaç 1033
23	Asteraceae	<i>Artemisia absinthium</i> L.		-	Wide	6	03.04.2016	Ortaç 1034
24	Asteraceae	<i>Bellis perennis</i> L.	Eu.-Siberian	-	Wide	7	08.05.2016	Ortaç 1035
25	Asteraceae	<i>Carduus pycnocephalus</i> L. subsp. <i>albidus</i> (Bieb.) Kazmi	Widespread	-	Wide	5	22.07.2016	Ortaç 1037
26	Asteraceae	<i>Centaurea calcitrapa</i> ssp. <i>cilicica</i> (Boiss. & Balansa) Wagenitz		-	Regional	3	08.05.2016	Arazi Gözlemi
27	Asteraceae	<i>Centaurea chrysantha</i> Wagenitz		End./EN	Regional	5	22.07.2016	Ortaç 1039
28	Asteraceae	<i>Centaurea iberica</i> Trevir. ex Spreng.	Widespread	-	Wide	7	08.05.2016	Ortaç 1040
29	Asteraceae	<i>Centaurea urvillei</i> DC. subsp. <i>armata</i> Wagenitz	E. Med. Reg.	-	Wide	6	03.04.2016	Ortaç 1044
30	Asteraceae	<i>Cichorium intybus</i> L.	Widespread		Wide	6	03.04.2016	Ortaç 1046
31	Asteraceae	<i>Echinops dumanii</i> C. Vural	Mediterranean	End/CR	Narrow	3	08.05.2016	Ortaç 1052
32	Asteraceae	<i>Echinops orientalis</i> Trautv.	İr.-Tur. Elm.,	-	Wide	1	08.05.2016	Ortaç 1053
33	Asteraceae	<i>Inula crithmoides</i> L.		-	Regional	1,2,3	08.05.2016	Ortaç 1055
34	Asteraceae	<i>Inula heterolepis</i> Boiss.	Mediterranean	-	Wide	5	22.07.2016	Ortaç 1057
35	Asteraceae	<i>Inula viscosa</i> (L.) Aiton	Mediterranean	-	Wide	2,3	07.04.2016	Ortaç 1058
36	Asteraceae	<i>Phagnalon graecum</i> Boiss.	E. Med. Reg.	-	Wide	5	22.07.2016	Ortaç 1066
37	Asteraceae	<i>Picnomon acarna</i> (L.) Cass.	Mediterranean	-	Wide	5	22.07.2016	Ortaç 1067
38	Astraceae	<i>Senecio vernalis</i> Waldst & Kit	Widespread	-	Wide	2,6	07.04.2016	Ortaç 1070
39	Asteraceae	<i>Silybum marianum</i> (L.) Gaertner (Schouw) D. Löve & P. Dansereau	Mediterranean	-	Wide	3,7	08.05.2016	Ortaç 1073
40	Asteraceae	<i>Sonchus oleraceus</i> L.		-	Wide	2	07.04.2016	Ortaç 1074
41	Asteraceae	<i>Tragopogon longirostris</i> Bisch ex Schultz Bip.		-	Wide	5	22.07.2016	Ortaç 1076
42	Asteraceae	<i>Xanthium spinosum</i> L.			Wide	6,7	03.04.2016	Ortaç 1078
43	Asteraceae	<i>Xanthium strumarium</i> L. subsp. <i>cavanillesii</i> (Schouw) D. Löve & P. Dansereau	Widespread	-	Wide	2,3	07.04.2016	Ortaç 1079
44	Boraginaceae	<i>Alkanna hispida</i> Hub.-Mor.	E. Med. Reg.	End./EN	Regional	5	22.07.2016	Ortaç 1084
45	Boraginaceae	<i>Anchusa aggregata</i> Lehm.	Mediterranean	-	Wide	3	08.05.2016	Ortaç 1087
46	Boraginaceae	<i>Anchusa azurea</i> Mill.	Widespread		Wide	6	03.04.2016	Ortaç 1088
47	Boraginaceae	<i>Cynoglossum creticum</i> Mill.		-	Wide	7	08.05.2016	Ortaç 1090
48	Boraginaceae	<i>Echium angustifolium</i> Mill.	E. Med. Reg.	-	Wide	4	07.04.2016	Ortaç 1092
49	Boraginaceae	<i>Echium parviflorum</i> Moench	Mediterranean	-	Wide	2	07.04.2016	Ortaç 1093
50	Boraginaceae	<i>Heliotropium europaeum</i> L.	Mediterranean	-	Wide	7	08.05.2016	Ortaç 1094
51	Boraginaceae	<i>Nonea obtusifolia</i> (Willd.) DC.	E. Med. Reg.	-	Wide	1	08.05.2016	Ortaç 1095
52	Boraginaceae	<i>Onosma alborosea</i> Fisch. & C.A.Mey.	Ir.-Turanian		Wide	6	03.04.2016	Ortaç 1096
53	Boraginaceae	<i>Onosma rascheyanum</i> Boiss.	Ir.-Turanian		Wide	6	03.04.2016	Ortaç 1097
54	Boraginaceae	<i>Mattiastrum calycinum</i> (Boiss. & Balansa) Brand	Ir.-Turanian	End./LC	Regional	5	22.07.2016	Ortaç 1098
55	Brassicaceae	<i>Arabis caucasica</i> Willd subsp. <i>brevifolia</i> (DC.) Cullen	E. Med. Reg.		Wide	6	03.04.2016	Ortaç 1101
56	Brassicaceae	<i>Capsella bursa-pastoris</i> (L.) Medik.	Widespread	-	Wide	7	08.05.2016	Ortaç 1106
57	Brassicaceae	<i>Cakile maritima</i> Scop.		-	Regional	1,3	08.05.2016	Ortaç 1105
58	Brassicaceae	<i>Diplotaxis tenuifolia</i> (L.) DC.			Wide	6	03.04.2016	Ortaç 1109
59	Brassicaceae	<i>Maresia nana</i> (DC.) Batt.		-	Wide	2	07.04.2016	Ortaç 1114
60	Brassicaceae	<i>Nasturtium officinale</i> R.Br	Widespread	-	Wide	7	08.05.2016	Ortaç 1115
61	Brassicaceae	<i>Neslia apiculata</i> Fisch.	Widespread		Wide	7	08.05.2016	Ortaç 1116

62	Brassicaceae	<i>Raphanus raphanistrum</i> L.	Widespread	-	Wide	3	08.05.2016	Ortaç 1117
63	Campanulaceae	<i>Legousia falcata</i> (Ten.) Fritsch	Mediterranean	-	Wide	7	08.05.2016	Ortaç 1126
64	Campanulaceae	<i>Michauxia campanuloides</i> L'Herit ex Aiton	E. Med. Reg.	-	Wide	5,6	03.04.2016	Ortaç 1127
65	Capparaceae	<i>Capparis spinosa</i> L.	-	-	Wide	5,7	08.05.2016	Ortaç 1129
66	Caryophyllaceae	<i>Dianthus polycladus</i> Boiss.	E. Med. Reg.	VU	Wide	3,6	08.05.2016	Ortaç 1132
67	Caryophyllaceae	<i>Silene colorata</i> Poirlet	-	-	Wide	3	08.05.2016	Ortaç 1138
68	Caryophyllaceae	<i>Silene viscosa</i> (L.) Pers	-	-	Wide	3	08.05.2016	Ortaç 1139
69	Chenopodiaceae	<i>Arthrocnemum fruticosum</i> (L.) Moq.	-	-	Regional	3	08.05.2016	Ortaç 1142
70	Chenopodiaceae	<i>Chenopodium album</i> L.	-	-	Wide	1,3,7	08.05.2016	Ortaç 1144
71	Chenopodiaceae	<i>Halimione portulacoides</i> (L.) Aellen	-	-	Regional	3	08.05.2016	Ortaç 1145
72	Chenopodiaceae	<i>Halocnemum strobilaceum</i> (Pall.) M.Bieb.	-	-	Regional	3	08.05.2016	Ortaç 1146
73	Chenopodiaceae	<i>Petrosimonia brachiata</i> (Pall.) Bunge	-	-	Wide	3	08.05.2016	Ortaç 1147
74	Chenopodiaceae	<i>Salsola soda</i> L.	-	-	Regional	2,3	07.04.2016	Ortaç 1151
75	Chenopodiaceae	<i>Salicornia europaea</i> L.	-	-	Regional	1	08.05.2016	Ortaç 1148
76	Cistaceae	<i>Cistus creticus</i> L.	Mediterranean	-	Regional	3,5,7	08.05.2016	Ortaç 1152
77	Cistaceae	<i>Cistus salviifolius</i> L.	Widespread	-	Regional	3	08.05.2016	Ortaç 1153
78	Cistaceae	<i>Helianthemum nummularium</i> (L.) Mill.	-	-	Wide	3	08.05.2016	Ortaç 1155
79	Convolvulaceae	<i>Calystegia sepium</i> (L.) R.Br.	Widespread	-	Wide	3,7	08.05.2016	Ortaç 1157
80	Convolvulaceae	<i>Convolvulus lanatus</i> Vahl	Sa. Sin. Reg.	-	Regional	3	08.05.2016	Ortaç 1159
81	Convolvulaceae	<i>Ipomoea stolonifera</i> (Cyr.) J.F.Gmelin	Mediterranean	-	Regional	1,2,3	08.05.2016	Ortaç 1160
82	Cornaceae	<i>Cornus sanguinea</i> L. subsp. <i>cilicica</i> (Wangerin) D.F.Chamb.	E. Med. Reg.	-	Wide	6	03.04.2016	Ortaç 1161
83	Corylaceae	<i>Ostrya carpinifolia</i> Scop.	Mediterranean	-	Wide	5,6	03.04.2016	Ortaç 1163
84	Crassulaceae	<i>Umbilicus erectus</i> DC.	-	-	Wide	5,6,7	03.04.2016	Ortaç 1165
85	Crassulaceae	<i>Sedum album</i> L.	Widespread	-	Wide	6	03.04.2016	Ortaç 1164
86	Cucurbitaceae	<i>Bryonia cretica</i> L.	E. Med. Reg.	-	Wide	7	08.05.2016	Ortaç 1166
87	Cyperaceae	<i>Bolboschoenus maritimus</i> (L.) Palla	Widespread	-	Wide	3	08.05.2016	Ortaç 1426
88	Cyperaceae	<i>Cyperus capitatus</i> Vandelli	-	-	Wide	1,2,3	22.07.2016	Ortaç 1427
89	Dipsacaceae	<i>Scabiosa rotata</i> M.Bieb.	Ir.-Turanian	-	Wide	3	08.05.2016	Ortaç 1169
90	Ericaceae	<i>Arbutus andrachne</i> L.	-	-	Regional	5	22.07.2016	Ortaç 1171
91	Ericaceae	<i>Erica manipuliflora</i> Salisb.	E. Med. Reg.	-	Wide	3	08.05.2016	Ortaç 1173
92	Euphorbiaceae	<i>Euphorbia aleppica</i> L.	Widespread	-	Wide	2,6	08.05.2016	Ortaç 1174
93	Euphorbiaceae	<i>Euphorbia helioscopia</i> L.	Widespread	-	Wide	1	08.05.2016	Ortaç 1175
94	Euphorbiaceae	<i>Euphorbia paralias</i> L.	Mediterranean	-	Wide	2	08.05.2016	Ortaç 1176
95	Euphorbiaceae	<i>Euphorbia peplus</i> L.	Widespread	-	Regional	3	08.05.2016	Ortaç 1178
96	Euphorbiaceae	<i>Mercurialis ovata</i> Sternb. & Hoppe	Eu.-Sibirian	-	Wide	5	22.07.2016	Ortaç 1179
97	Fabaceae	<i>Acacia nilotica</i> (L.) Willd. ex Delile subsp. <i>kraussiana</i> (Benth.) Brenan	Cultivar	-	Wide	2	08.05.2016	Ortaç 1181
98	Fabaceae	<i>Alhagi pseudalhagi</i> (Bieb.) Desv.	Ir.-Turanian	-	Wide	3	08.05.2016	Ortaç 1182
99	Fabaceae	<i>Anthyllis vulneraria</i> L. subsp. <i>boissieri</i> (Sag.) Bornm.	Widespread	-	Regional	5	22.07.2016	Ortaç 1184
100	Fabaceae	<i>Calicitome villosa</i> (Poirlet) Link	Mediterranean	-	Regional	5	22.07.2016	Ortaç 1189
101	Fabaceae	<i>Cercis sliquastrum</i> L. subsp. <i>hebecarpa</i> (Bornm.) Yalt.	-	-	Regional	5	22.07.2016	Ortaç 1191
102	Fabaceae	<i>Coronilla emerus</i> L. subsp. <i>emeroides</i> (Boiss. & Spruner) Uhrova	-	-	Wide	6	03.04.2016	Ortaç 1195
103	Fabaceae	<i>Dorycnium hirsutum</i> (L.) Ser.	Ir.-Turanian	-	Wide	3	08.05.2016	Ortaç 1198
104	Fabaceae	<i>Glycyrrhiza glabra</i> L. var. <i>glandulifera</i> (Waldst. & Kit.) Boiss.	Widespread	-	Wide	2,3	08.05.2016	Ortaç 1204
105	Fabaceae	<i>Lotus edulis</i> L.	Mediterranean	-	Wide	2,3	08.05.2016	Ortaç 1214
106	Fabaceae	<i>Lotus corniculatus</i> L.	Widespread	-	Wide	3	08.05.2016	Ortaç 1212
107	Fabaceae	<i>Lotus halophilus</i> Boiss. & Spruner	-	-	Regional	2	08.05.2016	Ortaç 1215
108	Fabaceae	<i>Medicago marina</i> L.	-	-	Wide	2	08.05.2016	Ortaç 1217
109	Fabaceae	<i>Melilotus alba</i> Desr.	Widespread	-	Wide	1,3	08.05.2016	Ortaç 1220
110	Fabaceae	<i>Ononis viscosa</i> L. subsp. <i>breviflora</i> (DC.) Nyman	-	-	Wide	3	22.07.2016	Ortaç 1226
111	Fabaceae	<i>Robinia pseudoacacia</i> L.	-	-	Wide	6	03.04.2016	Ortaç 1230
112	Fabaceae	<i>Trifolium campestre</i> Schreb.	Widespread	-	Wide	3	22.07.2016	Ortaç 1232

113	Fabaceae	<i>Trifolium purpureum</i> Lois.	Widespread		Wide	7	08.05.2016	Ortaç 1233
114	Fabaceae	<i>Trigonella spicata</i> Sibth. & Sm.	E. Med. Reg.	-	Wide	3	22.07.2016	Ortaç 1237
115	Fabaceae	<i>Vicia sativa</i> L.		-	Wide	3	22.07.2016	Ortaç 1242
116	Fagaceae	<i>Quercus coccifera</i> L.	Mediterranean	-	Regional	3,5,6	22.07.2016	Ortaç 1246
117	Gentianaceae	<i>Centaurium pulchellum</i> (Sw.) Druce	Widespread	-	Wide	1,3	08.05.2016	Ortaç 1248
118	Geraniaceae	<i>Erodium gruinum</i> L.	E. Med. Reg.		Wide	2	08.05.2016	Ortaç 1250
119	Geraniaceae	<i>Erodium malacoides</i> (L) L'Herit	Mediterranean		Wide	2	08.05.2016	Ortaç 1251
120	Geraniaceae	<i>Geranium dissectum</i> L.			Wide	7	08.05.2016	Ortaç 1253
121	Geraniaceae	<i>Geranium molle</i> L.		-	Wide	5	22.07.2016	Ortaç 1256
122	Geraniaceae	<i>Geranium purpureum</i> Vill.		-	Wide	5	22.07.2016	Ortaç 1257
123	Hypericaceae	<i>Hypericum hircinum</i> L.	Mediterranean	-	Regional	5	22.07.2016	Ortaç 1258
124	Hypericaceae	<i>Hypericum origanifolium</i> Willd.		-	Wide	5	22.07.2016	Ortaç 1259
125	Illecebraceae	<i>Paronychia argentea</i> Lam.	Mediterranean	-	Wide	3	22.07.2016	Ortaç 1262
126	Iridaceae	<i>Crocus pallasii</i> Goldb.			Wide	6	03.04.2016	Ortaç 1428
127	Iridaceae	<i>Iris pseudacorus</i> L.			Wide	7	08.05.2016	Ortaç 1431
128	Juncaceae	<i>Juncus acutus</i> L.		-	Regional	1,3	22.07.2016	Ortaç 1433
129	Juncaceae	<i>Juncus heldreichianus</i> Marsson ex Parl.	E. Med. Reg.	-	Wide	3	22.07.2016	Ortaç 1434
130	Juncaceae	<i>Juncus inflexus</i> L.	Widespread	-	Wide	3	22.07.2016	Ortaç 1435
131	Juncaceae	<i>Juncus maritimus</i> Lam.		-	Regional	1,2	22.07.2016	Ortaç 1436
132	Juncaceae	<i>Juncus rigidus</i> Desf.			Wide	2,3	08.05.2016	Ortaç 1437
133	Lamiaceae	<i>Ballota nigra</i> L. subsp. <i>uncinata</i> (Fiori & Beg) Patzak	Mediterranean		Wide	7	22.07.2016	Ortaç 1266
134	Lamiaceae	<i>Lamium amplexicaule</i> L.	Eu.- Sibirian		Wide	6	27.10.2016	Ortaç 1268
135	Lamiaceae	<i>Lamium garganicum</i> subsp. <i>striatum</i> (Sm.) Hayek	Mediterranean		Regional	6	22.07.2016	Ortaç 1269
136	Lamiaceae	<i>Melissa officinalis</i> L. subsp. <i>inodora</i> (Bornm.) Bornm.	E. Med. Reg.		Wide	7	22.07.2016	Ortaç 1275
137	Lamiaceae	<i>Mentha longifolia</i> (L.) Hudson subsp. <i>typhoides</i> (Briq.) Harley	Widespread	-	Wide	5,7	22.07.2016	Ortaç 1276
138	Lamiaceae	<i>Micromeria myrtifolia</i> Boiss. & Hohen.	E. Med. Reg.	-	Wide	5	22.07.2016	Ortaç 1277
139	Lamiaceae	<i>Origanum onites</i> L.	E. Med. Reg.	-	Wide	5	22.07.2016	Ortaç 1281
140	Lamiaceae	<i>Thymbra spicata</i> L.	E. Med. Reg.	-	Wide	3	22.07.2016	Ortaç 1311
141	Lamiaceae	<i>Salvia aucheri</i> Benth.		End./VU	Regional	6	27.10.2016	Ortaç 1290
142	Lamiaceae	<i>Salvia cilicica</i> Boiss. & Kotschy		End./VU	Regional	6	27.10.2016	Ortaç 1292
143	Lamiaceae	<i>Salvia viridis</i> L.	Mediterranean		Wide	2,4	07.04.2016	Ortaç 1297
144	Lamiaceae	<i>Stachys rupestris</i> Montbret & Aucher ex Benth.	E. Med. Reg.	End./LC	Regional	6	27.10.2016	Ortaç 1307
145	Lamiaceae	<i>Teucrium chamaedrys</i> L. subsp. <i>tauricola</i> Rech. fil.	Mediterranean		Regional	6	27.10.2016	Ortaç 1308
146	Lauraceae	<i>Laurus nobilis</i> L.	Mediterranean	-	Regional	5	23.10.2016	Ortaç 1312
147	Liliaceae	<i>Asphodelus aestivus</i> Bro	Mediterranean	-	Regional	3,5	22.07.2016	Ortaç 1443
148	Liliaceae	<i>Asphodeline taurica</i> (Pallas) Kunth	E. Med. Reg.		Regional	6	27.10.2016	Ortaç 1442
149	Liliaceae	<i>Hyacinthus orientalis</i> L.	E. Med. Reg.		Wide	6	27.10.2016	Ortaç 1445
150	Liliaceae	<i>Muscari neglectum</i> Guss.	Widespread		Wide	6	27.10.2016	Ortaç 1450
151	Liliaceae	<i>Prospero autumnale</i> (L.) Speta	Mediterranean	-	Regional	3	22.07.2016	Ortaç 1453
152	Liliaceae	<i>Smilax aspera</i> L.		-	Wide	3	22.07.2016	Ortaç 1454
153	Liliaceae	<i>Drimia maritima</i> (L.) Stearn	Mediterranean	-	Wide	5	23.10.2016	Ortaç 1456
154	Malvaceae	<i>Malva sylvestris</i> L.			Wide	7	22.07.2016	Ortaç 1316
155	Moraceae	<i>Ficus carica</i> L. subsp. <i>carica</i>			Wide	6,7	27.10.2016	Ortaç 1317
156	Moraceae	<i>Ficus carica</i> L. subsp. <i>rupestris</i> (Hausskn.) Browicz	Ir.-Turanian	-	Wide	5	23.10.2016	Ortaç 1318
157	Moraceae	<i>Morus alba</i> L.	Widespread		Wide	7	22.07.2016	Ortaç 1319
158	Mrytaceae	<i>Eucalyptus camaldulensis</i> Dehnh.			Wide	7	22.07.2016	Ortaç 1321
159	Myrtaceae	<i>Myrtus communis</i> L.			Bölgesel	2,3,4	07.04.2016	Ortaç 1322
160	Mrytaceae	<i>Punica granatum</i> L.		-	Wide	5,7	22.07.2016	Ortaç 1323
161	Oleaceae	<i>Jasminum fruticans</i> L.	Mediterranean	-	Regional	5,6	27.10.2016	Ortaç 1327
162	Oleaceae	<i>Olea europaea</i> L.	Mediterranean	-	Regional	3,5	22.07.2016	Ortaç 1328
163	Oleaceae	<i>Phillyrea latifolia</i> L.	Mediterranean	-	Regional	3,5,6	22.07.2016	Ortaç 1330

164	Onograceae	<i>Epilobium hirsutum</i> L.	Widespread		Wide	7	22.07.2016	Ortaç 1332
165	Orchidaceae	<i>Orchis anatolica</i> Boiss.	E. Med. Reg.	-	Regional	3	22.07.2016	Ortaç 1459
166	Orchidaceae	<i>Orchis laxiflora</i> Lam.	Mediterranean	-	Regional	3	22.07.2016	Ortaç 1460
167	Papaveraceae	<i>Glaucium corniculatum</i> (L.) Rudolph	Widespread		Wide	6	27.10.2016	Ortaç 1334
168	Platanaceae	<i>Platanus orientalis</i> L.	Widespread	-	Wide	5,6,7	27.10.2016	Ortaç 1343
169	Plantaginaceae	<i>Plantago major</i> L.			Wide	7	22.07.2016	Ortaç 1341
170	Plantaginaceae	<i>Plantago maritima</i> L.	Widespread		Regional	2,3	08.05.2016	Ortaç 1342
171	Plumbaginaceae	<i>Limonium angustifolium</i> (Tausch) Turrill	Mediterranean	-	Regional	3	22.07.2016	Ortaç 1344
172	Poaceae	<i>Elymus elongatus</i> (Host) Runemark			Wide	2,3	08.05.2016	Ortaç 1468
173	Poaceae	<i>Melicaeligulata</i> Boiss.	Mediterranean			7	22.07.2016	Ortaç 1472
174	Poaceae	<i>Phragmites australis</i> (Cav.) Trin. ex Steudel			Wide	2,3,4	08.05.2016	Ortaç 1474
175	Poaceae	<i>Piptatherum miliaceum</i> (L.) Cosson subsp. <i>thomasii</i> (Duby) Freitag		-	Wide	3	22.07.2016	Ortaç 1475
176	Poaceae	<i>Poa bulbosa</i> L.	Widespread	-	Wide	5	23.10.2016	Ortaç 1476
177	Poaceae	<i>Saccharum ravennae</i> (L.) Murray			Wide	2,3,4	08.05.2016	Ortaç 1477
178	Polygonaceae	<i>Polygonum equisetiforme</i> Sibth & Sm.			Wide	2,4	07.04.2016	Ortaç 1345
179	Polygonaceae	<i>Polygonum maritimum</i> L.			Wide	1,2,3	22.07.2016	Ortaç 1346
180	Polygonaceae	<i>Polygonum praelongum</i> Coode & Cullen	Widespread	-	Wide	3	22.07.2016	Ortaç 1347
181	Polygonaceae	<i>Rumex crispus</i> L.		-	Wide	1,3	22.07.2016	Ortaç 1348
182	Primulaceae	<i>Anagallis arvensis</i> L.		-	Wide	3,7	22.07.2016	Ortaç 1351
183	Ranunculaceae	<i>Anemone coronaria</i> L.	Mediterranean		Wide	6	27.10.2016	Ortaç 1359
184	Ranunculaceae	<i>Ranunculus muricatus</i> L.			Wide	7	22.07.2016	Ortaç 1367
185	Ranunculaceae	<i>Paliurus spina-christi</i> Mill.			Regional	3,5,6,7	22.07.2016	Ortaç 1369
186	Rhamnaceae	<i>Rhamnus oleoides</i> L. subsp. <i>graecus</i> (Boiss. & Reut.) Holmboe	E. Med. Reg.		Wide	2,3	08.05.2016	Ortaç 1371
187	Rosaceae	<i>Cotoneaster nummularia</i> Fisch. & C.A.Mey.			Wide	6	27.10.2016	Ortaç 1373
188	Rosaceae	<i>Crataegus aronia</i> (L.) Bosc. ex DC.			Wide	6	27.10.2016	Ortaç 1374
189	Rosaceae	<i>Prunus spinosa</i> L.	Eu.-Sibirian	-	Wide	5	23.10.2016	Ortaç 1378
190	Rosaceae	<i>Pyracantha coccinea</i> Roemer		-	Wide	3	22.07.2016	Ortaç 1379
191	Rosaceae	<i>Rubus sanctus</i> Schreber	Widespread		Wide	2,3,5,7	08.05.2016	Ortaç 1381
192	Rosaceae	<i>Sanguisorba minor</i> Scop. subsp. <i>muricata</i> (Spach) Briq.	Widespread		Wide	6	27.10.2016	Ortaç 1382
193	Rosaceae	<i>Sarcopoterium spinosum</i> (L.) Spach	E. Med. Reg.	-	Regional	1	22.07.2016	Ortaç 1383
194	Salicaceae	<i>Populus alba</i> L.	Eu.-Sibirian		Wide	7	22.07.2016	Ortaç 1387
195	Salicaceae	<i>Salix alba</i> L.	Eu.-Sibirian			3,5	22.07.2016	Ortaç 1390
196	Santalaceae	<i>Osyris alba</i> L.	Mediterranean	-	Wide	3	22.07.2016	Ortaç 1391
197	Schrophulariaceae	<i>Anarrhinum orientale</i> Benth	Ir.-Turanian		Wide	6	27.10.2016	Ortaç 1392
198	Scrophulariaceae	<i>Kickxia lanigera</i> (Desf.) Hand.-Mazz.	Mediterranean		Wide	7	22.07.2016	Ortaç 1393
199	Schrophulariaceae	<i>Linaria chalepensis</i> (L.) Mill.	E. Med. Reg.	-	Wide	5	23.10.2016	Ortaç 1394
200	Schrophulariaceae	<i>Scrophularia nodosa</i> L.	Eu.-Sibirian		Wide	6	27.10.2016	Ortaç 1395
201	Schrophulariaceae	<i>Scrophularia umbrosa</i> Dum.	Eu.-Sibirian			7	22.07.2016	Ortaç 1397
202	Schrophulariaceae	<i>Veronica cymbalaria</i> Bodard	Mediterranean		Wide	6,7	27.10.2016	Ortaç 1401
203	Scrophulariaceae	<i>Verbascum sinuatum</i> L. var. <i>sinuatum</i>	Mediterranean	-	Wide	3	22.07.2016	Ortaç 1399
204	Simaroubaceae	<i>Ailanthus altissima</i> (Miller) Swingle			Wide	7	22.07.2016	Ortaç 1403
205	Solanaceae	<i>Solanum nigrum</i> L.			Wide	7	22.07.2016	Ortaç 1405
206	Stryraceae	<i>Styrax officinalis</i> L.		-	Regional	5,6	27.10.2016	Ortaç 1406
207	Tamaricaceae	<i>Tamarix tetrandra</i> Pallas ex Bieb. emend. Willd.		-	Regional	3	22.07.2016	Ortaç 1408
208	Tamaricaceae	<i>Tamarix smyrnensis</i> Bunge		-	Wide	1,2,3,6	22.07.2016	Ortaç 1407
209	Thymeliaceae	<i>Daphne sericea</i> Vahl	E. Med. Reg.	-	Regional	3,5	22.07.2016	Ortaç 1410
210	Thymeliaceae	<i>Thymelaea hirsuta</i> (L.) Endl.	Mediterranean		Wide	2,4	08.05.2016	Ortaç 1411
211	Ulmaceae	<i>Ulmus glabra</i> Hudson	Eu.-Sibirian		Wide	7	22.07.2016	Ortaç 1413
212	Urticaceae	<i>Parietaria judaica</i> L.	Widespread	-	Wide	5,7	22.07.2016	Ortaç 1414
213	Urticaceae	<i>Urtica dioica</i> L.	Eu.-Sibirian	-	Wide	5	23.10.2016	Ortaç 1415
214	Valerianaceae	<i>Valeriana dioscoridis</i> Sm.	E. Med. Reg.	-	Wide	5	23.10.2016	Ortaç 1416
215	Verbanaceae	<i>Verbena officinalis</i> L.	Widespread			7	22.07.2016	Ortaç 1418

216	<i>Verbanaceae</i>	<i>Vitex agnus-castus</i> L.	Mediterranean		<i>Wide</i>	2,3,4	08.05.2016	Ortaç 1419
217	<i>Verbanaceae</i>	<i>Phyla nodiflora</i> (L.) Greene	Widespread	-	<i>Wide</i>	4	08.05.2016	Ortaç 1417
218	<i>Vitaceae</i>	<i>Ampelopsis orientale</i> (Lam.) Planchon			<i>Regional</i>	5	23.10.2016	Ortaç 1420
219	<i>Zygophyllaceae</i>	<i>Zygophyllum album</i> L.		VU		2,3	08.05.2016	Ortaç 1423