

## Flora of the Region between Zeytinbahçe and Akarçay (Birecik, Şanlıurfa, Turkey)

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**Abstract:** This research was carried out from 2004 to 2006 in order to determine the flora of the region between Zeytinbahçe and Akarçay, Birecik district. The research area is situated in Şanlıurfa province and within C7 of the grid system. In the area, 442 taxa belonging to 62 families and 253 genera were determined. Of all the collected specimens, 30 taxa are new records for the C7 square, 16 (3.59%) taxa are endemic for Turkey, 2 taxa belong to Cryptogamae, and 440 taxa belong to Phanerogamae.

In the distribution of the taxa according to floristic regions, Irano-Turanian elements ranked first, with a rate of 30.79%; followed by Mediterranean elements, with a rate of 11.46%; Euro-Siberian elements, with a rate of 2.92%; and Sahara-Arabian elements, with a rate of 0.22%. Of the species determined, 8.01% are widespread, while 46.77% of the taxa are of unknown or multiregional phytogeographical region.

The families with the most taxa in the research area are Asteraceae (64), Fabaceae (51), Poaceae (40), Brassicaceae (24), Lamiaceae (23), and Apiaceae (20). Concerning the number of species, the richest genera in this region are as follows: *Astragalus* L. (8), *Medicago* L. (8), *Trigonella* L. (7), *Euphorbia* L. (7), *Vicia* L. (6), *Trifolium* L. (6), *Centaurea* L. (5), and *Salvia* L. (4).

**Key Words:** Akarçay, Birecik, Flora, Şanlıurfa, Zeytinbahçe, Turkey

### Zeytinbahçe ve Akarçay Arasında Kalan Bölgenin Florası (Birecik / Şanlıurfa, Türkiye)

**Özet:** Bu araştırma 2004-2006 yılları arasında, Birecik'e ait Zeytinbahçe ile Akarçay arasında kalan bölgenin florasını tespit etmek üzere yapılmıştır. Araştırma alanı Şanlıurfa il sınırları içerisinde ve Grid sistemine göre C7 karesindedir. Araştırma bölgesinde 62 familyaya bağlı 253 cins ve 442 tür ve türaltı takson tespit edilmiştir. Bunlardan 30 takson C7 karesi için yeni kayıt, 16 (% 3,59) takson Türkiye için endemik, 2 takson kriptogam grubuna ve 440 takson ise fanerogam grubuna aittir.

Araştırma alanından toplanan 442 taksonun fitocoğrafik bölgelere göre dağılımı; Iran-Turan elementleri % 30,79, Akdeniz elementleri % 11,46, Avrupa-Sibirya elementleri % 2,92 ve Sahara-Arabian elementleri % 0,22 şeklindedir. Teşhisi yapılan taksonların % 8,01 i geniş yayılışlı, % 46,77'sinin ise bilinmeyen-çok bölgesel fitocoğrafik bölge elementi olduğu tespit edilmiştir.

Araştırma alanında en fazla taksona sahip familyalar; Asteraceae (64), Fabaceae (51), Poaceae (40), Brassicaceae (24), Lamiaceae (23) ve Apiaceae (20)'dir. Alanda en çok taksona sahip cinsler; *Astragalus* L. (8), *Medicago* L. (8), *Trigonella* L. (7), *Euphorbia* L. (7), *Vicia* L. (6), *Trifolium* L. (6), *Centaurea* L. (5) ve *Salvia* L. (4)'dir.

**Anahtar Sözcükler:** Akarçay, Birecik, Flora, Şanlıurfa, Zeytinbahçe, Türkiye

### Introduction

This research was carried out to determine the flora of the region between Zeytinbahçe and Akarçay in Şanlıurfa province. The vegetation of the area has been extensively destroyed by anthropogenic effects; therefore, plants are barely able to survive under the unsuitable agricultural conditions. Şanlıurfa is a province in south-east Anatolia. Natural habitats have

been destroyed during the construction of dams and tunnels for the irrigation of plains (Sezik, 1990). Therefore, the biological diversity, especially endemic plants, has been affected by this project. After the construction of dams, the populations of rare plants should be examined scientifically, and new reports should be prepared for the conservation of plant species.

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According to the *Flora of Turkey* (Davis, 1965-1985; Davis et al., 1988; Güner et al., 2000), some foreign researchers, among them Kotschy, Sintenis, Davis, and Zohary, have visited and gathered specimens from Şanlıurfa (Baytop, 2003). In south-east Anatolia, some floristic investigations, such as “The investigation of the flora of Sof mountains (Gaziantep, Turkey)” (Özulu et al., 2005), “The Flora of Kaşmer Mountain in Şanlıurfa” (Akan et al., 2005), “The Flora of Kalecik Mountain (Şanlıurfa)” (Aydoğdu & Akan, 2005), “The Flora of Osmanbey Campus in Harran University (Şanlıurfa)” (Parmaksız et al., 2006), “Flora of Mezra City” (Atamov et al., 2007a), “Dynamics of the Structure of Phytomass of Şanlıurfa’ (Turkey) Steppe Vegetation” (Aslan et al., 2007), and “Contribution to the Flora of Fatik Mountain” (Atamov et al., 2007b) have been performed recently, but there has been no vegetational research to date, except for a study carried out by Zohary (1973).

Some floristic and taxonomic studies were also carried out around south-east Anatolia (Kaynak & Ketenöğlü, 1980; Malyer, 1981, 1983; Kaynak, 1986, 1987, 1989a, 1989b; Ertekin & Saya, 1997; Ertekin, 2002; Adigüzel & Aytaç, 2001; Akan & Eker, 2004), but no regular floristic study has been performed in our research area, the region between Zeytinbahçe and Akarçay. Therefore, the aim of this research was to determine the flora of the region between Zeytinbahçe and Akarçay, and to determine the endemic and rare plant species.

South-east Anatolia is a “little known” or “unknown” region for floristic structure of Turkey, with regard to floristic studies (Davis, 1975; Çirpıcı, 1987). The research area is a “little known” area. Thus, this study is expected to contribute to the flora of Şanlıurfa, planned to be written in the future.

The research area is located in the Irano-Turanian phytogeographical region and is situated in the C7 square and is completely within the province of Şanlıurfa.

It is near the Euphrates, and is an important region representing the floristic composition of the province. The altitude varies between 400 and 650 m. In the research area, the highest point is Yalnız hill (650 m) and the lowest hill is Ziyaret (550 m). The other important hills are Abdallı hill (560 m) and Karaamut hill (551 m). The important valleys in research area are Zeytinbahçe, Akarçay, Bentbahçesi, and Şavi. Most of the valleys are

dry during summer. The important river in the region is the Euphrates. The Karkamış and Birecik dams are near the research area (Figure 1). The highest mountain in Birecik is Arat (888 m).

**Climate:** The research area has a semiarid Mediterranean climate. According to Emberger the precipitation-temperature coefficient (Q) is 42.91 (Akman, 1990). Annual mean temperature is 18.5 °C. The maximum mean temperature (M) is 39 °C. The minimum mean temperature (m) is 2.7 °C. Annual rainfall is about 458.1 mm (MGM, 2003), and the seasonal precipitation regime is winter, spring, autumn, and summer. This is the first variant of the East Mediterranean precipitation regime. The ombrothermic diagram shows dry and rainy periods (Figure 2).

## Materials and Methods

To constitute the research material, 1450 plant specimens were collected from the region between Zeytinbahçe and Akarçay between 2004 and 2006 in different vegetation seasons. Collector numbers were given, and the specimens were prepared according to the standard herbarium methods. The *Flora of Turkey and the East Aegean Islands* (Davis, 1965-1985; Davis et al., 1988, Güner et al., 2000), and also some floras of neighbouring countries like Iran (Podlech et al, 2001), Palestine and Syria (Zohary, 1987), and Iraq (Townsend, 1974) were used to identify the plant specimens.

The species found are listed below. The list is set out according to the order in the *Flora of Turkey*. In the list the following details are given: family, species, author(s), locality, collection date, altitude, habitat, collector, and number. The phytogeographical region, IUCN threat categories, and endemism rate are also given. New records for C7 are indicated with an asterisk in the list.

The endemic species were categorised according to IUCN Red Data categories (Ekim et al., 2000; IUCN Red List Categories and Criteria, 2006).

The area is completely within C7 and Şanlıurfa province, and so “C7 Şanlıurfa; Birecik” has been omitted from the citations.

The following abbreviations are used in the text: E: east, El.: Element, Euro.-Sib.: Euro-Siberian, Ir.-Tur.: Irano-Turanian, m: metre, Medit.: Mediterranean, N: North, NE: North-east, NW: North-west, S: South, SE:

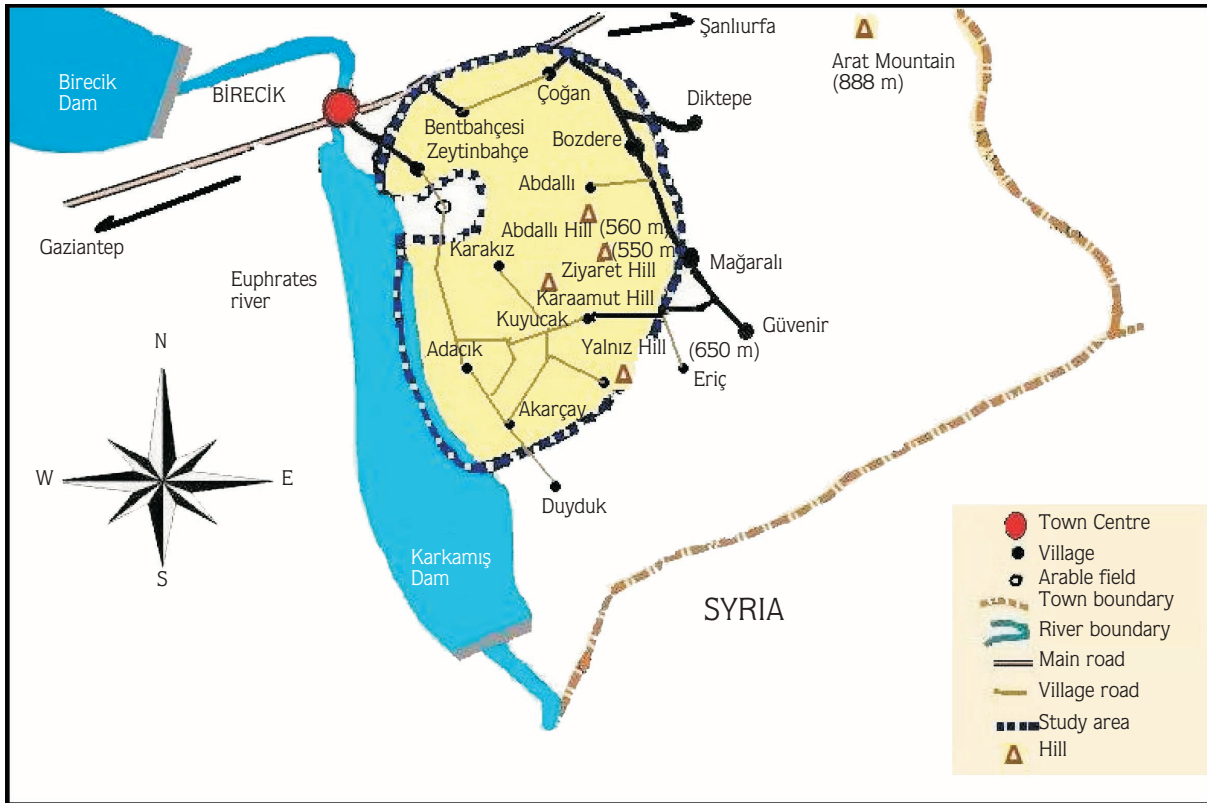


Figure 1. Map of the study area.

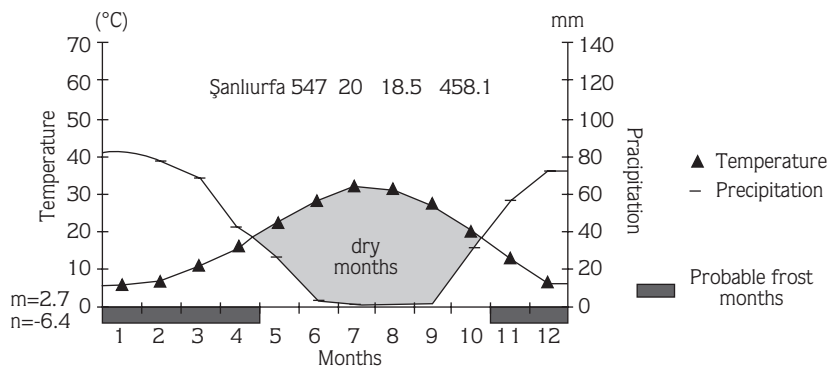


Figure 2. Ombrothermic diagram of Şanlıurfa, Turkey.

South-east, SW: South-west, W: West, MMB: Mehmet Maruf BALOS, Akan: Hasan AKAN, CR-Critically endangered; EN-Endangered; VU-Vulnerable; NT-Near Threatened; LC-Least concern.

The plant samples collected from the region are kept in the herbarium of Harran University, Biology Department, Şanlıurfa.

**General Vegetation of Study Area:** In the research area, steppe vegetation is characterised by Fabaceae, Asteraceae, and Poaceae members. *Aegilops biuncialis* Vis., *Anchusa azurea* Mill. var. *azurea*, *A. russelii* Banks & Sol., *Avena sterilis* L. subsp. *Iudoviciana* (Durieu) Gillet & Magne, *Bromus tectorum* L., *Centaurea solstitialis* L. subsp. *solstitialis*, *Filago pyramidata* L., *Gundelia*

*tournefortii* L. var. *armata* Freyn & Sint., *Hordeum bulbosum* L., *Hypericum retusum* Aucher, *Onopordum carduchorum* Bornm. & Beauverd, *Poa bulbosa* L., *Teucrium polium* L., *Thymbra spicata* L. var. *spicata*, *Trigonella mesopotamica* Hub.-Mor., *Triticum aestivum* L., and *Stipa holosericea* Trin are dominant.

*Arundo donax* L., *Cyperus fuscus* L., *Cyperus rotundus* L., *Mentha pulegium* L., *Phragmites australis* (Cav.) Trin. ex Steud., and *Typha domingensis* Pers. are examples found in damp, wet, and waterside habitats.

*Parietaria judaica* L., *Ephedra campylopoda* C.A.Mey., *Adiantum capillus-veneris* L., and *Alkanna hirsutissima* (Bertol.) DC. are some examples found in rocky habitats.

*Capparis ovata* Desf. subsp. *palaestina* Zohary, *Capparis spinosa* L. var. *spinosa*, *Celtis tournefortii* Lam., *Crataegus aronia* (L.) Bosc ex DC. var. *aronia*, *C. monogyna* Jacq. subsp. *monogyna*, *Elaeagnus angustifolia* L., *Ficus carica* L., *Nerium oleander* L., *Rubus sanctus* Schreb., *Rhus coriaria* L., *Rhamnus punctatus* Boiss. var. *punctatus* are examples of trees and shrubs that are spread at intervals in the study area.

## THE FLORISTIC LIST

### PTERIDOPHYTA

#### EQUISETACEAE

*Equisetum arvense* L.

Şavi stream side, 2 km N of Adacık, 24.04.2004. 430 m, stream sides, MMB 602.

### ADIANTACEAE

*Adiantum capillus-veneris* L.

1 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 01.05.2005, 510 m, moist banks, MMB 1397.

### SPERMATOPHYTA

#### GYMNOSPERMAE

#### EPHEDRACEAE

*Ephedra campylopoda* C.A.Mey.

Adacık (Şavi) village, 09.05.2004, 415 m, hillside, MMB 762; Bentbahçesi, 19.06.2005, 480 m, hillside, MMB 1421.

### ANGIOSPERMAE

#### MAGNOLIOPSIDA (DICOTYLEDONEAE)

#### RANUNCULACEAE

*Nigella arvensis* L. var. *caudata* Boiss.

5 km from Mezra to Adacık village, Şavi stream side, 06.06.2004, 415 m, steppe, MMB 916.

*Delphinium peregrinum* L.

Bentbahçesi stream, 19.06.2005, 480 m, steppe, MMB 1415.

*Anemone coronaria* L.

1 km N of Adacık village, 11.04.2004, 350 m, steppe, MMB 453, Medit. El.

*Adonis microcarpa* DC.

Between Bentbahçesi and Bozdere village, 27.03.2005, 490 m, steppe, MMB 1227/b & Akan.

*A. flammea* Jacq.

NE of Akarçay, 04.04.2004, 450 m, steppe, MMB 284; Abdallı village, 27.03.2005, 495 m, steppe, MMB 1264 & Akan.

*Ranunculus neapolitanus* Ten.

E of Zeytinbahçe village, 27.03.2004, 400 m, roadside, pistachio gardens, MMB 169.

*R. damascenus* Boiss. & Gaill.

Between Zeytinbahçe village and Akarçay village, 27.03.2004, 400 m, fallow fields, MMB 135; Near Zeytinbahçe tumulus, 09.05.2004, 465 m, steppe, MMB 739, Ir.-Tur. El.

*R. asiaticus* L.

NE of Akarçay village, 04.04.2004, 450 m, steppe, MMB 268; Ziyaret hill, 09.05.2004, 560-645 m, steppe, MMB 846, Ir.-Tur. El.

*R. millefolius* Banks & Sol.

3 km from Mezra to Adacık village, 11.04.2004, 371 m, steppe, MMB 373; 2 km from Bentbahçesi to Bozdere village, 27.03.2005, 490 m, steppe, MMB 1226 & Akan.

*R. cornutus* DC.

S of Mezra, 09.05.2004, 465 m, meadows, MMB 759.

\**R. ficaria* L. subsp. *ficariiformis* Rouy & Foucaud

Between Birecik and Akarçay village, 27.03.2004,

400 m, stream sides, MMB 180; Near Zeytinbahçe tumulus, 27.03.2004, 400 m, stream sides, MMB 185.

**R. trichophyllus** Chaix

Zeytinbahçe village, 26.02.2005, 450 m, aquatic places, MMB 1166, widespread.

**Ceratocephalus falcatus** (L.) Pers.

E of Zeytinbahçe village, 27.03.2004, 400 m, roadside, pistachio gardens, MMB 158, widespread.

**C. testiculatus** (Crantz) Roth

2 km from Bentbahçesi to Bozdere village, 27.03.2005, 490 m, steppe, MMB 1210 & Akan, widespread.

**BERBERIDACEAE**

**Leontice leontopetalum** L. subsp. *leontopetalum*

E of Zeytinbahçe village, 27.03.2004, 400 m, steppe, MMB 243/b & Akan, Ir.-Tur. El.

**Bongardia chrysogonum** (L.) Spach

2 km from Bentbahçesi to Bozdere village, 27.03.2005, 490 m, steppe, MMB 243 & Akan, Ir.-Tur. El.

**PAPAVERACEAE**

**Glaucium grandiflorum** Boiss. & Huett var. *grandiflorum*

5 km from Zeytinbahçe village to Abdallı village, 01.05.2005, 544 m, steppe, MMB 1332, Ir.-Tur. El.

**Roemeria hybrida** (L.) DC. subsp. *hybrida*

NE of Akarçay village, 04.04.2004, 450 m, steppe, MMB 283.

**Papaver glaucum** Boiss. & Hausskn.

Bentbahçesi village, 01.05.2005, 532 m, fallow fields, MMB 1364, Ir.-Tur. El.

**P. rhoeas** L.

Ziyaret hill, 09.05.2004, 560-645 m, steppe, MMB 787; Bentbahçesi, 19.06.2005, 480 m, steppe, MMB 1413.

**P. syriacum** Boiss. & Blanche

3 km NE of Akarçay village, 06.06.2004, 430 m, MMB 959.

**P. dubium** L.

Bozdere village, 27.03.2005, 490 m, steppe, MMB 1229 & Akan.

**P. clavatum** Boiss. & Hausskn. ex Boiss.

S of Zeytinbahçe tumulus, 24.04.2004, 430 m, roadside, MMB 473; Near Zeytinbahçe tumulus, 09.05.2004, 465 m, steppe, MMB 733, Endemic, LC.

**P. argemone** L. subsp. *argemone*

NE of Akarçay, 04.04.2004, 450 m, steppe, MMB 282

**\*P. hybridum** L.

Zeytinbahçe village, 27.03.2004, 400 m, steppe, MMB 194; Adacık, 24.04.2004. 430 m, steppe, MMB 611.

**\*Fumaria officinalis** L.

Between Zeytinbahçe and Akarçay village, 27.03.2004, 400 m, fallow fields, MMB 123; 2 km from Bentbahçesi to Bozdere village, 27.03.2005, 490 m, steppe, MMB 1194.

**BRASSICACEAE (CRUCIFERAE)**

**Sinapis alba** L.

Zeytinbahçe village, 27.03.2004, & Akan, 400 m, steppe, MMB 195;

**S. arvensis** L.

Zeytinbahçe village, 27.03.2004, 400 m, steppe, MMB 140.

**Hirschfeldia incana** (L.) Lagr.-Foss.

Zeytinbahçe, 01.05.2005, 489 m, stream sides, MMB 1304.

**Eruca sativa** Mill.

Ziyaret hill, 09.05.2004, 560-645 m, rocky limestone slopes, MMB 790.

**Raphanus raphanistrum** L.

S of Zeytinbahçe tumulus, 24.04.2004, 440 m, roadside, MMB 513.

**Cardaria draba** (L.) Desv. subsp. *draba*

Zeytinbahçe village, 27.03.2004, 400 m, roadside, MMB 168 & Akan, widespread.



**Isatis lusitanica** L.

Between Zeytinbahçe village and Akarçay village, 27.03.2004, 400 m, fallow fields, MMB 139 & Akan, Ir.-Tur. El.

**Iberis acutiloba** Bertol.

Adacık village, 11.04.2004, 371 m, steppe, MMB 344; Bozdere village, 27.03.2005, 490 m, steppe, MMB 1190.

**Thlaspi perfoliatum** L.

NE of Akarçay village, 04.04.2004, 450 m, steppe, MMB 308; N of Zeytinbahçe village, near graveyard, 26.02.2005, 450 m, steppe, MMB 1164, widespread.

**Capsella bursa-pastoris** (L.) Medik.

Zeytinbahçe, 26.02.2005, 450 m, fallow fields, MMB 1170, widespread.

**Neslia apiculata** Fisch., C.A.Mey. & Avé-Lall.

Between Mezra and Adacık village, 24.04.2004, 440 m, river banks, MMB 683.

**Alyssum meniocoides** Boiss.

Şeyhgavan hill, 26.02.2005, 470 m, steppe, MMB 1157; N of Zeytinbahçe village, near graveyard, 26.02.2005, 450 m, steppe, MMB 1163, Ir.-Tur. El.

**A. aureum** (Fenzl) Boiss.

27.03.2005, 495 m, steppe, MMB 1262, Ir.-Tur. El.

**Nasturtium officinale** R.Br.

Adacık village, 11.04.2004, 350 m, stream sides, MMB 456.

**Matthiola longipetala** (Vent.) DC.

Şavi stream side, 24.04.2004, 430 m, MMB 617.

**Chorisporea syriaca** Boiss.

E of Zeytinbahçe village, 27.03.2004, 400 m, steppe, MMB 207 & Akan, Ir.-Tur. El.

**Malcolmia crenulata** (DC.) Boiss.

Zeytinbahçe village, 26.02.2005, 450 m, fallow fields, MMB 1169; Bentbahçesi village, 27.03.2005, 490 m, steppe, MMB 1186, Ir.-Tur. El.

**Erysimum goniocaulon** Boiss.

3 km from Mezra to Adacık village, 11.04.2004, 371 m, steppe, MMB 350/a.

**E. hamosum** Blanche ex Post

Bentbahçesi village, 27.03.2005, 490 m, steppe, MMB 1192, Ir.-Tur. El.

**E. smyrnaeum** Boiss. & Balansa

N of Bentbahçesi village, 01.05.2005, 532 m, stream sides, MMB 1367.

**Sisymbrium officinale** (L.) Scop.

3 km from Mezra to Adacık village, 11.04.2004, 371 m, rocky place, steppe, MMB 365, widespread.

**S. orientale** L.

Zeytinbahçe, 27.03.2004, 400 m, stream sides, MMB 183.

**Descurainia sophia** (L.) Webb ex Prantl

Between Zeytinbahçe village and Akarçay village, 27.03.2004, 400 m, fallow fields, MMB 124, widespread.

**Camelina hispida** Boiss. var. *hispida*

Bentbahçesi village, 19.06.2005, 480 m, stream sides, MMB 1412.

**CAPPARACEAE**

**Capparis spinosa** L. var. *spinosa*

Adacık village, Şavi stream, 26.09.2004, 500 m, rocky slopes, MMB 1110.

**C. ovata** Desf. subsp. *palaestina* Zohary

Zeytinbahçe village, 26.09.2004, 450 m, roadside, MMB 1076.

**RESEDACEAE**

**\*Reseda alba** L.

3 km from Mezra to Adacık village, 11.04.2004, 400 m, rocky place, MMB 360.

**R. lutea** L. var. *lutea*

Ziyaret hill, 09.05.2004, 560-645 m, steppe, rocky limestone slopes, MMB 793, widespread.

**CISTACEAE**

**Helianthemum ledifolium** (L.) Mill. var. *ledifolium*

3 km from Mezra to Adacık village, 11.04.2004, 371 m, rocky place, MMB 322.

**H. salicifolium** (L.) Mill.

Between Bentbahçesi and Bozdere village, 27.03.2005, 490 m, steppe, MMB 1195.

## PORTULACACEAE

*Portulaca oleracea* L.

Zeytinbahçe village, 26.09.2004, 450 m, fallow fields, MMB 1094.

## CARYOPHYLLACEAE

*Arenaria sabulina* Griseb. ex Fenzl

3 km from Mezra to Adacık village, 11.04.2004, 371 m, rocky place, MMB 368; *ibid.*, 11.04.2004, MMB 382, Ir.-Tur. El, Endemic, LC.

*Minuartia decipiens* (Fenzl) Bornm. subsp. *decipiens*

E of Zeytinbahçe village, 27.03.2004, 400 m, roadside, MMB 165 & Akan; E of Akarçay village, 04.04.2004, 350 m, stream sides, MMB 249.

*M. hybrida* (Vill.) Schischk. subsp. *hybrida*

Bentbahçesi village, 27.03.2005, 490 m, steppe, MMB 1202, *Medit. El.*

*M. montana* L. subsp. *wiesneri* (Stapf) McNeill

E of Zeytinbahçe village, 27.03.2004, 400 m, steppe, MMB 201 & Akan, Ir.-Tur. El.

*Stellaria media* (L.) Vill. subsp. *media*

1 km S of Mezra, 09.05.2004, 465 m, river banks, MMB 746.

*Cerastium dichotomum* L. subsp. *dichotomum*

Bozdere village, 27.03.2005, 490 m, steppe, MMB 1255 & Akan.

*Spergularia diandra* (Guss.) Heldr. & Sart.

4 km from Şanlıurfa-Birecik main road to Bentbahçesi village 01.05.2005, 600 m, steppe, MMB 1328.

*Dianthus floribundus* Boiss.

Karakız village, 20.06.2005, 470 m, steppe, MMB 1505/b, Ir.-Tur. El.

*D. strictus* Banks & Sol. var. *strictus*

N of Akarçay village, 06.06.2004, 490 m, MMB 935; 1 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 01.05.2005, 510 m, steppe, MMB 1399.

*Ankyropetalum gypsophiloides* Fenzl

N of Akarçay village, 06.06.2004, 490 m, fallow fields, MMB 937, Ir.-Tur. El.

*Gypsophila ruscifolia* Boiss.

NE of Akarçay, 04.04.2004, 450 m, steppe, MMB 310.

*G. antari* Post & Beauverd

NE of Akarçay, 04.04.2004, 450 m, steppe MMB 273; Şavi stream side, 1 km N of Adacık, 09.05.2004, 415 m, stream sides, MMB 776, Sahora-Arabian El.

*G. pilosa* Huds.

Between Bentbahçesi and Bozdere village, 2 km, 27.03.2005, 490 m, steppe, MMB 1205, Ir.-Tur. El.

*Vaccaria pyramidata* Medik. var. *oxyodonta* (Boiss.) Zohary

Zeytinbahçe, 01.05.2005, 489 m, MMB 1281, Ir.-Tur. El.

*V. pyramidata* Medik. var. *liniflora* (Boiss. & Hausskn.) Cullen

1 km from Mezra to Adacık village, 24.04.2004, 450 m, fallow fields, MMB 647.

*Silene chaetodonta* Boiss.

NE of Akarçay, 04.04.2004, 450 m, steppe, MMB 286, Ir.-Tur. El.

*S. colorata* Poir.

Şavi stream side, 24.04.2004. 430 m, stream sides, MMB 607.

*S. lydia* Boiss.

Between Bentbahçesi village and Tılfar (Bozdere), 27.03.2005, 490 m, steppe, MMB 1247, E. *Medit. El.*

*S. coniflora* Nees

5 km from Mezra to Adacık village, Şavi stream side, 06.06.2004, 415 m, MMB 912.

## ILLECEBRACEAE

*\*Paronychia kurdica* Boiss. subsp. *haussknechtii* Chaudhri

3 km from Zeytinbahçe village from Adacık village, 28.07.2004, 460 m, steppe, MMB 1125.

## POLYGONACEAE

*\*Polygonum salicifolium* Brouss. ex Willd.

Zeytinbahçe village, 26.09.2004, 450 m, fallow fields, MMB 1093; 1 km S of Mezra, 20.06.2005, 450 m, meadows, MMB 1521; Zeytinbahçe, 20.06.2005, 450 m, roadside, MMB 1545.

**Rumex patientia** L.

Zeytinbahçe stream, 01.05.2005, 489 m, stream sides, MMB 1271.

**R. crispus** L.

1 km S of Mezra, 09.05.2004, 465 m, river banks, MMB 758, widespread.

**R. dentatus** L.

1 km S of Mezra, 28.07.2004, 400 m, river banks, MMB 1143.

**CHENOPODIACEAE**

**Chenopodium botrys** L.

1 km S of Mezra, 20.06.2005, 450 m, river banks, MMB 1542.

**C. album** L. subsp. **album** var. **album**

N of Akarçay village, 06.06.2004, 490 m, in fields, MMB 932.

\***C. album** L. subsp. **album** var. **iranicum** Aellen

3 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 19.06.2005, 480 m, fields, MMB 1453/b.

\***Salsola ruthenica** Iljin

3 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 19.06.2005, 480 m, steppe, MMB 1460.

**S. tragus** L.

Near Adacık village, 26.09.2004, 500 m, steppe, MMB 1071.

**AMARANTHACEAE**

**Amaranthus retroflexus** L.

Zeytinbahçe village, 26.09.2004, 450 m, fallow fields, MMB 1082.

**TAMARICACEAE**

**Tamarix smyrnensis** Bunge

Zeytinbahçe village, 26.09.2004, 450 m, stream sides, MMB 1079.

**HYPERICACEAE (GUTTIFERAE)**

**Hypericum retusum** Aucher

Near Adacık village, 20.06.2005, 430 m, steppe, MMB 1511, Ir.-Tur. El.

**H. capitatum** Choisy var. **capitatum**

4 km from Şanlıurfa-Birecik main road to Bentbahçesi village 01.05.2005, 600 m, steppe, MMB 1323, Ir.-Tur. El, Endemic, VU.

**H. capitatum** Choisy var. **luteum** Robson

Adacık village, 19.06.2005, 430 m, steppe, MMB 1473, Ir.-Tur. El.

**MALVACEAE**

**Malva sylvestris** L.

1 km S of Mezra, 28.07.2004, 400 m, river banks, MMB 1141.

**M. neglecta** Wallr.

Zeytinbahçe, 01.05.2005, 489 m, roadside, MMB 1278.

**Alcea striata** (DC.) Alef. subsp. **striata**

1 km S of Mezra, 20.06.2005, 450 m, river banks, MMB 1534.

**A. digitata** (Boiss.) Alef.

Zeytinbahçe, 19.06.2005, 450 m, roadside, MMB 1464, Ir.-Tur. El.

**A. apterocarpa** (Fenzl) Boiss.

Bozdere village, 19.06.2005, 480 m, steppe, MMB 1462, Ir.-Tur. El, Endemic, LC.

**LINACEAE**

**Linum mucronatum** Bertol subsp. **orientale** (Boiss.) Davis

Ziyaret hill, 09.05.2004, 560-645 m, steppe, MMB 837.

**L. strictum** L. var. **spicatum** Pers.

Şavi stream side, 09.05.2004, 415 m, steppe, MMB 767.

**GERANIACEAE**

**Geranium rotundifolium** L.

Zeytinbahçe stream, 27.03.2004, 400 m, stream sides, MMB 187 & Akan, Th.

\***G. columbinum** L.

3 km from Mezra to Adacık village, 11.04.2004, 371 m, steppe, MMB 328.



*G. dissectum* L.

Between Mezra and Adacık village, 24.04.2004, 450 m, in valley, MMB 634.

*G. tuberosum* L. subsp. *tuberosum*

Between Mezra and Adacık village, 11.04.2004, 371 m, steppe, MMB 353.

*Erodium gruinum* (L.) L'Hér.

Ziyaret hill, 09.05.2004, 560-645 m, steppe, MMB 828, E. Medit. El.

*E. cicutarium* (L.) L'Hér. subsp. *cutarium*

E of Zeytinbahçe village, 27.03.2004, 400 m, steppe, MMB 204, Medit. El.

*E. ciconium* (L.) L'Hér.

1 km from Mezra to Adacık village, 24.04.2004, 440 m, steppe, MMB 674.

## ZYGOPHYLLACEAE

*Tribulus terrestris* L.

Karakız village, 19.06.2005, 470 m, steppe, MMB 1499.

*Peganum harmala* L.

S of Mezra, 20.06.2005, 450 m, steppe, MMB 1539.

## RHAMNACEAE

*\*Rhamnus punctatus* Boiss. var. *punctatus*

Ziyaret hill, 09.05.2004, 560-645 m, steppe, MMB 800; Bentbahçesi stream, 19.06.2005, 480 m, MMB 1418; Karakız village, 19.06.2005, 470 m, slopes, MMB 1498.

## ANACARDIACEAE

*Rhus coriaria* L.

N of Bentbahçesi village, 01.05.2005, 532 m, slopes, MMB 1354.

## FABACEAE (LEGUMINOSAE)

*Argyrolobium crotalarioides* Jaub. et Spach

S of Mezra village, 24.04.2004, 440 m, steppe, MMB 687, between Ziyaret hill-Abdallı village, 01.05.2005, 550 m, steppe, MMB 1345, E. Medit. El.

*Astragalus asterias* Stev. ex Ledeb.

Bozdere village, 27.03.2005, 490 m, steppe, MMB 1222, Ir.-Tur. El.

*A. hamosus* L.

3 km from Mezra to Adacık village, 11.04.2004, 371 m, rocky place, steppe, MMB 405.

*A. cretaceus* Boiss. & Kotschy

Between Zeytinbahçe village and Abdallı village, 01.05.2005, 510 m, steppe, MMB 1381, Ir.-Tur. El.

*A. aleppicus* Boiss.

E of Zeytinbahçe village, 27.03.2004, 400 m, steppe, MMB 244, Ir.-Tur. El.

*A. russelii* Banks & Sol.

NE of Akarçay village, 04.04.2004, 450 m, steppe, MMB 313, Ir.-Tur. El.

*A. aduncus* Willd.

Between Ziyaret hill-Abdallı village, 01.05.2005, 550 m, steppe, MMB 1343, Ir.-Tur. El.

*A. ancistrocarpus* Boiss. & Hausskn.

Adacık village, 28.07.2004, 460 m, steppe, MMB 1126, Ir.-Tur. El.

*A. elongatus* Willd. subsp. *nucleiferus* (Boiss.) Chamb.

E of Zeytinbahçe village, 27.03.2004, 400 m, steppe, MMB 236; 2 km from Bentbahçesi to Bozdere village, 27.03.2005, 490 m, steppe, MMB 1191, Ir.-Tur. El., Endemic, LC.

*Trigonella coelsyriaca* Boiss.

Between Bentbahçesi village and Tılfar (Bozdere), 490 m, steppe, MMB 1256, Ir.-Tur. El.

*T. spruneriana* Boiss. var. *spruneriana*

Bozdere village, 24.04.2004, 450 m, fallow fields, MMB 495, Ir.-Tur. El.

*T. mesopotamica* Hub.-Mor.

NE of Akarçay village, 04.04.2004, 450 m, steppe, MMB 261, Ir.-Tur. El.

*T. astroites* Fisch. & C.A.Mey.

Ziyaret hill, 500 m, 09.05.2004, steppe, MMB 863, Ir.-Tur. El.

- T. monantha* C.A.Mey. subsp. *monantha*  
Between Ziyaret hill and Abdallı village, 01.05.2005, 550 m, steppe, MMB 1342, Ir.-Tur. El.
- T. monantha* C.A.Mey. subsp. *noeana* (Boiss.) Hub.-Mor.  
Near Zeytinbahçe tumulus, 24.04.2004, 450 m, fallow fields, MMB 536, Ir.-Tur. El.
- T. monspeliaca* L.  
Ziyaret hill, 09.05.2004, 640 m, steppe, MMB 817, Medit. El.
- Glycyrrhiza glabra* L. var. *glabra*  
Zeytinbahçe village, 27.03.2004, 400 m, roadside, MMB 170.
- Vicia peregrina* L.  
E of Zeytinbahçe village, 27.03.2004, 400 m, roadside, pistachio gardens, MMB 151.
- V. palaestina* Boiss.  
Between Ziyaret hill and Abdallı stream, 27.03.2005, 626 m, steppe, MMB 1266.
- V. anatolica* Turriell  
Between Zeytinbahçe village and Abdallı village, 01.05.2005, 510 m, steppe, MMB 1382, Ir.-Tur. El
- V. hybrida* L.  
Zeytinbahçe village, 01.05.2005, 489 m, steppe, MMB 1276, Th.
- V. sativa* L. subsp. *nigra* L. var. *nigra* (L.) Ehrh.  
E of Zeytinbahçe village, 27.03.2004, 400 m, roadside, MMB 150.
- V. narbonensis* L. var. *narbonensis*  
Between Bentbahçesi and Bozdere village, 27.03.2005, 490 m, steppe, MMB 1182.
- Lens orientalis* (Boiss.) Hand.-Mazz.  
NE of Akarçay, 04.04.2004, 450 m, steppe, MMB 295.
- Lathyrus cicera* L.  
N of Bentbahçesi village, 01.05.2005, 532 m, steppe, MMB 1375.
- L. sativus* L.  
3 km from Mezra to Adacık village, 11.04.2004, 371 m, steppe, MMB 393.
- Ononis spinosa* L. subsp. *leiosperma* (Boiss.) Sirj.  
Bentbahçesi village, 20.06.2005, 480 m, roadside, MMB 1528, widespread.
- Trifolium nigrescens* Viv. subsp. *petrisavii* (Clem.) Holmboe  
Near Zeytinbahçe tumulus, 09.05.2004, 465 m, steppe, MMB 730/a.
- T. campestre* Schreb.  
1 km from Mezra to Adacık village, 24.04.2004, 450 m, in valley, MMB 633.
- T. resupinatum* L. var. *resupinatum*  
1 km S of Mezra, 09.05.2004, 465 m, river banks, MMB 756.
- T. tomentosum* L.  
S of Zeytinbahçe tumulus, 24.04.2004, 430 m, roadside, MMB 479.
- T. stellatum* L. var. *stellatum*  
Near Zeytinbahçe tumulus, 09.05.2004, 465 m, steppe, MMB 730/b.
- T. leucanthum* M.Bieb.  
1 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 01.05.2005, 510 m, steppe, MMB 1391.
- Melilotus officinalis* (L.) Desr.  
S of Zeytinbahçe village, 24.04.2004, 430 m, roadside, MMB 477.
- Medicago radiata* L.  
Near Zeytinbahçe tumulus, 24.04.2004, 450 m, fallow fields, MMB 531, Ir.-Tur. El.
- M. orbicularis* (L.) Bartal.  
Zeytinbahçe, 01.05.2005, 489 m, steppe, MMB 1273.
- M. sativa* L. subsp. *sativa*  
Zeytinbahçe, 19.06.2005, 450 m, roadside, MMB 1467.
- M. polymorpha* L. var. *polymorpha*  
E of Zeytinbahçe village, 27.03.2004, 400 m, roadside, MMB 152.
- M. polymorpha* L. var. *vulgaris* (Benth.) Shinnars  
3 km from Mezra to Adacık village, 11.04.2004, 371 m, steppe, MMB 372.

**\*M. granadensis** Willd.

Zeytinbahçe stream, 01.05.2005, 489 m, steppe, MMB 1274, E. Medit. El.

**M. rigidula** (L.) All. var. *submitis* (Boiss.) Heyn

Bentbahçesi, 01.05.2005, 532 m, stream sides, MMB 1373.

**M. rigidula** (L.) All. var. *rigidula*

S of Zeytinbahçe village, 24.04.2004, 430 m, roadside, MMB 469.

**Hymenocarpus circinnatus** (L.) Savi

5 km from Mezra to Adacık village, 06.06.2004, 430 m, steppe, MMB 891.

**Coronilla scorpioides** (L.) Koch

Between Zeytinbahçe and Abdallı village, 01.05.2005, 510 m, steppe, MMB 1386.

**Hippocrepis unisiliquosa** L. subsp. *unisiliquosa*

5 km from Mezra to Adacık village, Şeyhgavan hill, 11.04.2004, 410 m, steppe, MMB 459.

**H. unisiliquosa** L. subsp. *bisiliqua* (Forssk.) Bornm.

N of Bentbahçesi village, 01.05.2005, 532 m, stream sides, MMB 1371.

**Hedysarum pannosum** (Boiss.) Boiss.

Between Zeytinbahçe village and Abdallı village, 01.05.2005, 510 m, steppe, MMB 1384, Ir.-Tur. El.

**Onobrychis crista-galli** (L.) Lam.

Bozdere village, 27.03.2005, 490 m, steppe, MMB 1260, Medit. El.

**O. megataphros** Boiss.

S of Mezra, 26.09.2004, 450 m, steppe, MMB 1056, Ir.-Tur. El.

**Prosopis farcta** (Banks & Sol.) J.F.Macbr.

Near Adacık village, 28.07.2004, 460 m, steppe, MMB 1129.

**Alhagi pseudalhagi** (M.Bieb.) Desv.

Zeytinbahçe village, 20.06.2005, 450 m, roadside, MMB 1546.

## ROSACEAE

**Amygdalus arabica** Oliv.

E of Zeytinbahçe village, 27.03.2004, 400 m, steppe, MMB 146, Ir.-Tur. El.

**A. lycioides** Spach var. *lycioides*

Şavi stream side, 09.05.2004, 415 m, MMB 771.

**Rubus sanctus** Schreb.

Karakız village, 20.06.2005, 470 m, steppe, MMB 1503.

**Potentilla reptans** L.

NE of Akarçay village 3 km, 06.06.2004, 430 m, steppe, MMB 957.

**Sangiosorba minor** Scop. subsp. *lasiocarpa* (Boiss. & Hausskn.) Nordborg

3 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 19.06.2005, 480 m, moist places, MMB 1453.

**Crataegus monogyna** Jacq. subsp. *monogyna*

Karakız village, 19.06.2005, 470 m, open hillsides, MMB 1497.

**Crataegus aronia** (L.) Bosc ex DC. var. *aronia*

Between Ziyaret hill-Abdallı village, 01.05.2005, 550 m, steppe, MMB 1340.

## PUNICACEAE

**Punica granatum** L.

Bentbahçesi stream, 19.06.2005, 480 m, rocky place, MMB 1417, cultivated.

## LYTHRACEAE

**Lythrum salicaria** L.

Zeytinbahçe village, 26.09.2004, 450 m, fallow fields, MMB 1072, Euro.-Sib. El.

## ONAGRACEAE

**Epilobium hirsutum** L.

S of Mezra, 20.06.2005, 450 m, river banks, MMB 1535.

**E. parviflorum** Schreb.

S of Mezra, 28.07.2004, 400 m, river banks, MMB 1144.

## CRASSULACEAE

**Telmis microcarpa** (Sm.) Boiss.

N of Bentbahçesi village, 01.05.2005, 532 m, rocky places, MMB 1370.

*Sedum caespitosum* (Cav.) DC.

NE of Akarçay, 04.04.2004, 450 m, steppe, MMB 259, *Medit. El.*

**APIACEAE (UMBELLIFERAE)**

*Ammi visnaga* Lam.

Bentbahçesi, 06.06.2004, 500-600 m, roadside, MMB 924, *Medit. El.*

*Eryngium creticum* Lam.

Bentbahçesi stream, 19.06.2005, 480 m, steppe, MMB 1428, *E. Medit. El.*

*E. bithynicum* Boiss.

Bentbahçesi stream, 19.06.2005, 480 m, steppe, MMB 1413, *Ir.-Tur. El.*, *Endemic, LC.*

*Lagoecia cuminoides* L.

S of Mezra, 24.04.2004, 450 m, steppe, MMB 630, *Medit. El.*

*Echinophora tenuifolia* L. subsp. *sibthorpiana* (Guss.) Tutin

Karakız village, 20.06.2005, 470 m, fields, MMB 1504, *Ir.-Tur. El.*

*Scandix stellata* Banks & Sol.

N of Bentbahçesi village, 01.05.2005, 532 m, steppe, MMB 1365.

*S. iberica* M. Bieb.

Near Bentbahçesi village, 19.06.2005, 480 m, steppe, MMB 1450.

*S. pecten-veneris* L.

Near Bozdere village, 27.03.2005, 500 m, steppe, MMB 1231 & Akan.

*Pimpinella eriocarpa* Banks & Sol.

Ziyaret hill, 09.05.2004, 560-645 m, steppe, rocky limestone slopes, MMB 815, *Ir.-Tur. El.*

*P. corymbosa* Boiss.

Near Bentbahçesi village, 01.05.2005, 600 m, steppe, MMB 1327, *Ir.-Tur. El.*

*Bupleurum brevicaulis* Schltldl.

Ziyaret hill, 09.05.2004, 560-645 m, rocky limestone slopes, MMB 813, *Ir.-Tur. El.*

*B. croceum* Fenzl

Bentbahçesi stream, 19.06.2005, 480 m, steppe, MMB 1414, *Ir.-Tur. El.*

*Ferulago macrocarpa* (Fenzl) Boiss.

Bentbahçesi stream, 19.06.2005, 480 m, stream sides, MMB 1419, *Ir.-Tur. El.*

*Malabaila secacul* Banks & Sol.

N of Bentbahçesi village, 01.05.2005, 532 m, stream sides, MMB 1357.

*Ainsworthia trachycarpa* Boiss.

Near Adacık village, 06.06.2004, 430 m, steppe, MMB 887, *E. Medit. El.*

*Torilis arvensis* (Huds.) Link subsp. *arvensis*

3 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 19.06.2005, 480 m, steppe, MMB 1452.

*T. leptophylla* (L.) Reichg.

Adacık village, 19.06.2005, 430 m, steppe, MMB 1476, *widespread.*

*T. tenella* (Delile) Reichg.

3 km from Mezra to Adacık village, 11.04.2004, 371 m, steppe, MMB 350.

*Daucus broteri* Ten.

Adacık village, 19.06.2005, 430 m, steppe, MMB 1474.

*Artemisia squamata* L.

Near Bentbahçesi village, 19.06.2005, 480 m, steppe, MMB 1442.

**VALERIANACEAE**

*Valerianella kotschyi* Boiss.

Near Bozdere village, 11.04.2004, 371 m, steppe, MMB 396, *Ir.-Tur. El.*

*V. vesicaria* (L.) Moench

Between Mezra and Adacık village, 11.04.2004, 371 m, rocky place, MMB 359.

**DIPSACACEAE**

*Cephalaria syriaca* (L.) Schrad.

4 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 01.05.2005, 600 m, steppe, MMB 1324/a.

*Scabiosa persica* Boiss.

Ziyaret hill, 09.05.2004, 560-645 m, steppe, MMB 852, Ir.-Tur. El.

*S. argentea* L.

4 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 19.06.2005, 480 m, steppe, MMB 1446.

**ASTERACEAE (COMPOSITAE)***Xanthium spinosum* L.

1 km S of Mezra, 26.09.2004, 450 m, steppe, MMB 1055/b.

*X. strumarium* L. subsp. *strumarium*

1 km S of Mezra, 26.09.2004, 450 m, steppe, MMB 1055/a.

*Inula britannica* L.

Zeytinbahçe village, 26.09.2004, 450 m, fallow fields, MMB 1072, Euro.-Sib. El.

*\*Pulicaria dysenterica* (L.) Bernh.

1 km S of Mezra, 28.07.2004, 400 m, river banks, MMB 1136, widespread.

*Phagnalon rupestre* (L.) DC.

N of Bentbahçesi village, 01.05.2005, 532 m, stream sides, MMB 1355, Medit. El.

*Filago pyramidata* L.

N of Bentbahçesi village, 01.05.2005, 532 m, stream sides, MMB 1361, widespread.

*\*Conyza bonariensis* (L.) Cronquist

3 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 19.06.2005, 480 m, stream sides, MMB 1450.

*\*Bellis perennis* L.

E of Zeytinbahçe village, 27.03.2004, 400 m, moist meadows, MMB 141, Euro.-Sib. El.

*Senecio vernalis* Waldst. & Kit Tan

Between Bentbahçesi and Bozdere village, 27.03.2005, 490 m, fields, MMB 1180 & Akan, widespread.

*Calendula arvensis* L.

Zeytinbahçe, 26.02.2005, 450 m, fallow fields, MMB 1171, widespread.

*Anthemis pauciloba* Boiss var. *pauciloba*

Ziyaret hill, 09.05.2004, 560-645 m, steppe, MMB 830, E. Medit. El, Endemic, LC.

*A. hyalina* DC.

3 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 19.06.2005, 480 m, stream sides, MMB 1458.

*A. altissima* L.

Zeytinbahçe, 01.05.2005, 489 m, stream sides, MMB 1306, widespread.

*A. scariosa* Banks & Sol.

Zeytinbahçe stream, 01.05.2005, 489 m, stream sides, MMB 1272.

*A. wiedemanniana* Fisch. & C.A.Mey.

Near Zeytinbahçe tumulus, 09.05.2004, 465 m, steppe, MMB 740.

*Matricaria aurea* (L.) Sch.Bip.

Bozdere village, 27.03.2005, 490 m, steppe, MMB 1257 & Akan.

*Tripleurospermum parviflorum* (Billb.) Pobed.

E of Zeytinbahçe village, 27.03.2004, 400 m, roadside, MMB 159.

*Achillea membranacea* (Lab.) DC.

Ziyaret hill, 09.05.2004, 560-645 m, rocky limestone slopes MMB 792, Ir.-Tur. El.

*A. wilhelmsii* C.Koch

Near Abdallı village, 01.05.2005, 550 m, roadside, MMB 1339, Ir.-Tur. El.

*A. aleppica* DC. subsp. *aleppica*

Between Ziyaret hill and Zeytinbahçe, 500 m, 09.05.2004, steppe, MMB 876, Ir.-Tur. El.

*A. biebersteinii* Afan.

N of Bentbahçesi village, 01.05.2005, 532 m, steppe, MMB 1356, widespread.

*Artemisia herba-alba* Asso

Near Adacık village, 20.06.2005, 430 m, steppe, MMB 1512, Ir.-Tur. El.

*Gundelia tournefortii* L. var. *armata* Freyn & Sint.

Near Adacık village, 24.04.2004, 450 m, steppe, MMB 636, Ir.-Tur. El.

*Cousinia ramosissima* DC.

5 km from Mezra to Adacık village, Şavi stream side, 06.06.2004, 415 m, steppe, MMB 923, Ir.-Tur. El.



**C. birecikensis** Hub.-Mor.

5 km from Mezra to Adacık village, 06.06.2004, 415 m, rocky slopes, MMB 919; Abdallı village, Ziyaret hill, 19.06.2005, 520 m, steppe, MMB 1470; Adacık village, 19.06.2005, 430 m, steppe, MMB 1471, Ir.-Tur. El, Endemic, EN.

**Onopordum carduchorum** Bornm. & Beauverd

5 km from Mezra to Adacık village, 06.06.2004, 415 m, steppe, MMB 920, Ir.-Tur. El.

**O. acanthium** L.

1 km S of Mezra, 09.05.2004, 465 m, river banks, MMB 760.

\***Cirsium libanoticum** DC. subsp. **arachnoideum** Davis & Parris

Near Adacık village, 20.06.2005, 430 m, roadside, MMB 1509, Ir.-Tur. El.

**Picnomon acarna** (L.) Cass.

Bentbahçesi village, 20.06.2005, 480 m, steppe, MMB 1531, widespread.

**Notobasis syriaca** (L.) Cass.

S of Mezra, 500 m. 09.05.2004, 465 m, river banks, MMB 724, Medit. El.

**Carduus pycnocephalus** L. subsp. **breviphyllarius** P.H.Davis

Ziyaret hill, 09.05.2004, 560-645 m, rocky limestone slopes, MMB 780, Ir.-Tur. El.

**Centaurea virgata** Lam.

Adacık village, 28.07.2004, 460 m, steppe, MMB 1122, widespread.

**C. solstitialis** L. subsp. **solstitialis**

Adacık village, 19.06.2005, 430 m, steppe, MMB 1482, widespread.

**C. depressa** M.Bieb.

Near Abdallı village, 01.05.2005, 550 m, fallow fields, MMB 1337, widespread.

**C. iberica** Trevis. ex. Spreng.

E of Akarçay village, 04.04.2004, 320 m, stream sides, MMB 258, widespread.

**C. hyalolepis** Boiss.

Bentbahçesi stream, 19.06.2005, 480 m, stream sides, MMB 1435, Ir.-Tur. El.

**Crupina crupinastrum** (Moris) Vis.

N of Bentbahçesi village, 01.05.2005, 532 m, stream sides, MMB 1378, widespread.

**Carlina lanata** L.

Adacık village, 19.06.2005, 430 m, steppe, MMB 1478, Medit. El.

\***C. corymbosa** L.

Near Adacık village, 20.06.2005, 430 m, steppe, MMB 1510, Medit. El.

**C. oligocephala** Boiss & Kotschy subsp. **oligocephala** Boiss. & C.A.Mey.

3 km from Mezra to Adacık village, 11.04.2004, 371 m, steppe, MMB 341.

\***Atractylis cancellata** L.

Adacık village, near Şavi stream, 19.06.2005, 430 m, steppe, MMB 1477, Medit. El.

**Chardinia orientalis** (L.) O.Kuntze

1 km from Mezra to Adacık village, 24.04.2004, 440 m, steppe, MMB 696, Ir.-Tur. El.

**Echinops viscosus** DC. subsp. **bithynicus** (Boiss.) Rech.f.

S of Mezra, 09.05.2004, 465 m, river banks, MMB 745, Ir.-Tur. El.

\***Scolymus hispanicus** L.

5 km from Mezra to Adacık village, 06.06.2004, 430 m, steppe, MMB 900, Medit. El.

\***Catananche lutea** L.

NE of Akarçay, 04.04.2004, 450 m, steppe, MMB 285, Medit. El.

**Cichorium intybus** L.

5 km from Mezra to Adacık village, Şavi stream side, 06.06.2004, 415 m, steppe, MMB 904, widespread.

**Koelpinia linearis** Pallas

Ziyaret hill, 09.05.2004, 560-645 m, steppe, MMB 823, Ir.-Tur. El

**Scorzonera laciniata** L. subsp. **laciniata**

Between Ziyaret hill and Abdallı village, 01.05.2005, 550 m, steppe, MMB 1349, widespread.

**S. pseudolanata** Grossh.

S of Mezra, 24.04.2004, 450 m, steppe, MMB 666, Ir.-Tur. El.

*S. kotschyii* Boiss.

N of Adacık village, 24.04.2004, 440 m, dry valley, MMB 714, Ir.-Tur. El.

*Tragopogon longirostris* Bisch. ex Sch.Bip. var. *longirostris*

N of Adacık village, 24.04.2004, 440 m, dry valley, MMB 710.

\**Leontodon laciniatus* (Bertol.) Widder ex Bornm.

3 km from Mezra to Adacık village, 11.04.2004, 371 m, steppe, MMB 349.

*Picris strigosa* M.Bieb.

Akarçay stream, Karakız village, 19.06.2005, 470 m, steppe, MMB 1494, Ir.-Tur. El.

\**Urospermum picroides* (L.) F.W.Schmidt

N of Adacık village, 24.04.2004, 440 m, dry valley, MMB 713, Medit. El.

*Hedypnois cretica* (L.) Dum.Cours.

NE of Akarçay, 04.04.2004, 450 m, steppe, MMB 308, Medit. El.

*Rhagadiolus stellatus* (L.) Gaertn. var. *leiocarpus* DC.

Near Zeytinbahçe tumulus, 24.04.2004, 430 m, roadside, MMB 467, Medit. El

*R. hamosus* (Boiss. & Hausskn.) Kupicha

NE of Akarçay, 04.04.2004, 450 m, steppe, MMB 294, Ir.-Tur. El.

*Sonchus asper* (L.) Hill subsp. *glaucescens* (Jord.) Ball

Şavi stream, 26.09.2004, 500 m, MMB 1102.

*Lactuca serriola* L.

Bentbahçesi village, 20.06.2005, 480 m, steppe, MMB 1532, Euro.-Sib. El.

*Scariola orientalis* (Boiss.) Soják

Adacık village, 11.04.2004, 350 m, steppe, MMB 637.

*S. viminea* (L.) F.W.Schmidt

Zeytinbahçe village, 20.06.2005, 450 m, roadside, MMB 1544.

\**Taraxacum syriacum* Boiss.

Ziyaret hill, 09.05.2004, 560-645 m, steppe, MMB 839, Ir.-Tur. El.

*T. aleppicum* Dahlst.

3 km from Mezra to Adacık village, 11.04.2004, 371 m, steppe, MMB 357, E. Medit. El.

*T. sintenisii* Dahlst.

1 km N of Adacık village, Şavi stream, 26.09.2004, 500 m, rocky slopes, MMB 1112; 1 km from Mezra to Adacık village, 28.07.2004, 420 m, steppe, MMB 1152.

*T. phaleratum* G.E.Haglund ex Rech.

Between Ziyaret hill and Zeytinbahçe, 500 m, 09.05.2004, steppe, MMB 886.

*T. officinalis* L.

Bozdere village, 27.03.2005, 490 m, steppe, MMB 1258 & Akan.

*Crepis sancta* (L.) Babç.

Bentbahçesi village, 01.05.2005, 510 m, steppe, MMB 1390, widespread.

*C. vesicaria* L.

Near Zeytinbahçe tumulus, 24.04.2004, 450 m, fallow fields, MMB 533, Medit. El.

## PRIMULACEAE

*Androsace maxima* L.

Bozdere village, 27.03.2005, 500 m, steppe, MMB 1236 & Akan.

*Anagallis arvensis* L. var. *arvensis*

Between Zeytinbahçe village and Akarçay village, 27.03.2004, 400 m, fallow fields, MMB 131.

*A. arvensis* L. var. *caerulea* (L.) Gouan

5 km from Mezra to Adacık village, 06.06.2004, 430 m, steppe, MMB 890.

## APOCYNACEAE

*Nerium oleander* L.

5 km from Mezra to Adacık village, Şavi stream side, 06.06.2004, 415 m, stream sides, MMB 910, Medit. El.

*Vinca herbacea* Waldst. & Kit Tan

E of Zeytinbahçe village, 27.03.2004, 400 m, steppe, MMB 232.

#### ASCLEPIADACEAE

*Vincetoxicum canescens* (Willd.) Decne. subsp. *canescens*

4 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 19.06.2005, 480 m, steppe, MMB 1445.

*Cionura erecta* (L.) Griseb.

Near Adacık village, 26.09.2004, 500 m, steppe, MMB 1067.

#### GENTIANACEAE

*Gentiana olivieri* Griseb.

4 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 01.05.2005, 600 m, steppe, MMB 1321, Ir.-Tur. El.

#### CONVOLVULACEAE

*Convolvulus reticulatus* Choisy subsp. *reticulatus*

5 km from Mezra to Adacık village, 06.06.2004, 430 m, steppe, MMB 893, Ir.-Tur. El.

*C. dorycnium* L. subsp. *oxysepalus* (Boiss.) Rech.

5 km from Mezra to Adacık village, 06.06.2004, 430 m, steppe, MMB 899, E. Medit. El.

*C. betonicifolius* Mill. subsp. *peduncularis* (Boiss.) Paris

Akarçay stream, Karakız village, 20.06.2005, 470 m, by stream, MMB 1508, Ir.-Tur. El.

*C. arvensis* L.

S of Mezra, 20.06.2005, 450 m, river banks, MMB 1533, widespread.

*C. galaticus* Rostan ex Choisy

4 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 01.05.2005, 600 m, steppe, MMB 1329, Ir.-Tur. El, Endemic, LC.

*C. stachydifolius* Choisy

S of Zeytinbahçe village, 24.04.2004, 450 m, steppe, MMB 488, Ir.-Tur. El.

*C. scammonia* L.

Zeytinbahçe village, 26.09.2004, 450 m, fallow fields, MMB 1074.

#### CUSCUTACEAE

*Cuscuta campestris* Yunck.

Adacık village, 20.06.2005, 430 m, steppe, MMB 1516.

#### BORAGINACEAE

*Heliotropium bovei* Boiss.

N of Akarçay village, 06.06.2004, 490 m, in gardens, MMB 940, Medit. El.

*H. myosotoides* Banks & Sol.

S of Mezra, 26.09.2004, 450 m, river banks, MMB 1049, Ir.-Tur. El.

*Asperugo procumbens* L.

Near Zeytinbahçe tumulus, 24.04.2004, 430 m, stream sides, MMB 466, Euro.-Sib. El.

*Myosotis stricta* Link ex Roem. & Schult.

Bozdere village, 27.03.05, 490 m, steppe, MMB 1184, Euro.-Sib. El

*M. refracta* Boiss. subsp. *refracta*

Between Bentbahçesi village and Tılfar (Bozdere), 27.03.05, 490 m, steppe, MMB 1251 & Akan, Ir.-Tur. El.

*Cynoglossum creticum* Mill.

S of Zeytinbahçe village, 24.04.2004, 440 m, roadside, MMB 505.

*Arnebia decumbens* (Vent.) Coss. & Kralik

3 km from Mezra to Adacık village, 11.04.2004, 371 m, steppe, MMB 356; Ir.-Tur. El.

*Moltkia coerulea* (Willd.) Lehm.

Between Ziyaret hill-Abdallı village, 01.05.05, 550 m, steppe, MMB 1344, Ir.-Tur. El.

*Onosmo molle* DC.

4 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 01.05.05, 600 m, steppe, MMB 1322, Ir.-Tur. El.

*Anchusa azurea* Mill. var. *azurea*

Ziyaret hill-Abdallı district, 27.03.2005, 626 m, steppe, MMB 1269.

**A. strigosa** Labill.

1 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 01.05.2005, 510 m, steppe, MMB 1400, Ir.-Tur. El.

**A. aucheri** DC.

Zeytinbahçe village, 27.03.2004, 400 m, fallow fields, MMB 137.

\***Alkanna trichophila** Hub.-Mor. var. **mardinensis** Hub.-Mor.

Zeytinbahçe village 26.02.2005, 450 m, fallow fields, MMB 1175, Endemic, LC.

**A. hirsutissima** (Bertol.) DC.

Ziyaret hill, 09.05.2004, 560-645 m, rocky limestone slopes, MMB 804, Ir.-Tur. El.

**SOLANACEAE****Solanum nigrum** L. subsp. **nigrum**

Adacık village, 19.06.2005, 430 m, steppe, MMB 1485.

**Datura stramonium** L.

Between Zeytinbahçe-Adacık, 28.07.2004, 460 m, steppe, MMB 1132, widespread.

**Hyoscyamus reticulatus** L.

Abdallı village, 27.03.2005, 495 m, steppe, MMB 1265 & Akan, Ir.-Tur. El.

**SCROPHULARIACEAE****Verbascum agrimoniifolium** (C.Koch) Hub.-Mor.

1 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 01.05.2005, 510 m, steppe, MMB 1398, Ir.-Tur. El.

**V. alepense** Benth.

Near Adacık village, Şavi stream side, 26.09.2004, 500 m, steppe, MMB 1059, Ir.-Tur. El.

**V. tenue** Murb.

Near Abdallı village, 01.05.2005, 550 m, steppe, MMB 1338, Ir.-Tur. El, Endemic, VU.

**V. kotschyi** Boiss. & Hohen.

Akarçay stream, 3 km NE of Akarçay village, 06.06.2004, 430 m, steppe MMB 947, Ir.-Tur. El.

**Anarrhinum orientale** Benth.

N of Bentbahçesi village, 01.05.2005, 532 m, stream sides, MMB 1377, Ir.-Tur. El

\***Kickxia elatine** (L.) Dumort. subsp. **crinita** (Mabille) Greuter

Adacık village, 20.06.2005, 430 m, steppe, MMB 1515, Medit. El.

**Veronica syriaca** Roem. & Schult.

2 km from Bentbahçesi to Bozdere village, 27.03.2005, 490 m, steppe, MMB 1225/a & Akan, Ir.-Tur. El.

**V. reuterana** Boiss.

E of Zeytinbahçe village, 27.03.2004, 400 m, steppe, MMB 225, E. Medit. El.

**V. debilis** Freyn

E of Zeytinbahçe village, 27.03.2004, 400 m, roadside, MMB 160 E. Medit. El.

**V. persica** Poir.

Zeytinbahçe, 26.02.2005, 450 m, fallow fields, MMB 1173.

**V. orientalis** Mill. subsp. **orientalis**

Between Zeytinbahçe and Abdallı village, 01.05.2005, 510 m, steppe, MMB 1380.

**Parentucellia latifolia** (L.) Caruel subsp. **flaviflora** (Boiss.) Hand.-Mazz.

Between Bentbahçesi and Bozdere village, 27.03.2005, 490 m, steppe, MMB 1207 & Akan.

**ORABANCHACEAE****Orabanche aegyptiaca** Pers.

Zeytinbahçe village, 26.09.2004, 450 m, fields, MMB 1090.

**\*O. minor** Sm.

Ziyaret hill, 09.05.2004, 560-645 m, steppe, MMB 825.

**O. kurdica** Boiss. & Hausskn.

Şavi stream side, 2 km N of Adacık, 24.04.2004. 430 m, steppe, MMB 587, Ir.-Tur. El.

**O. anatolica** Boiss. & Reut.

Ziyaret hill, 09.05.2004, 560-645 m, steppe, MMB 791.

## VERBENACEAE

*Phyla nodiflora* (L.) Greene

S of Mezra, 20.06.2005, 450 m, meadows, MMB 1520, cultivated.

*Verbena officinalis* L.

S of Mezra, 20.06.2005, 450 m, meadows, MMB 1518.

## LAMIACEAE (LABIATAE)

*Ajuga chamaepitys* (L.) Schreb. subsp. *laevigata* (Banks & Sol.) P.H.Davis

1 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 01.05.2005, 510 m, steppe MMB 1401, Ir.-Tur. El.

*Teucrium multicaule* Montbret & Aucher ex Benth.

Between Ziyaret hill-Abdallı village, 01.05.2005, 550 m, steppe, MMB 1341, Ir.-Tur. El.

*T. polium* L.

Adacık village, 11.04.2004, 371 m, steppe, MMB 322, widespread.

\**Scutellaria orientalis* L. subsp. *porphyrostegia* Edmondston

Ziyaret hill, 09.05.2004, 560-645 m, steppe, MMB 844, Ir.-Tur. El, Endemic, VU.

*S. tomentosa* Bertol.

NE of Akarçay, 04.04.2004, 450 m, steppe, MMB 311, Ir.-Tur. El.

*Phlomis pungens* Willd. var. *pungens*

Bentbahçesi stream, 19.06.2005, 480 m, steppe, MMB 1422.

*P. syriaca* Boiss.

4 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 19.06.2005, 480 m, steppe, MMB 1441, Ir.-Tur. El.

*P. kurdica* Rech.f.

1 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 01.05.2005, 510 m, steppe, MMB 1406, Ir.-Tur. El.

*Lamium aleppicum* Boiss. & Hausskn.

2 km from Bentbahçesi to Bozdere village, 27.03.2005, 490 m, steppe, MMB 1196 & Akan, Ir.-Tur. El.

*Moluccella laevis* L.

N of Akarçay village, 06.06.2004, 490 m, in fields, MMB 933, Ir.-Tur. El.

\**Marrubium parviflorum* Fisch. & C.A.Mey. subsp. *oligodon* (Boiss.) Seybold

Near Adacık village, 26.09.2004, 500 m, steppe, MMB 1068, Endemic, LC.

\**Sideritis libanotica* Labill. subsp. *microchlamys* (Hand.-Mazz.) Hub.-Mor.

Near Adacık village, 06.06.2004, 430 m, stream sides, MMB 960, Ir.-Tur. El.

*Stachys iberica* M.Bieb. var. *iberica*

N of Adacık village, 26.09.2004, 500 m, steppe, MMB 1117, Ir.-Tur. El.

*Thymus haussknechtii* Velen.

3 km from Zeytinbahçe village from Adacık village, 28.07.2004, 460 m, steppe, MMB 1130, Ir-Tur El., Endemic, NT.

*Thymbra spicata* L. var. *spicata*

Bentbahçesi, 19.06.2005, 480 m, steppe, MMB 1429, E. Medit. El.

*Mentha pulegium* L.

N of Adacık village, 11.04.2004, 350 m, stream sides, MMB 444, Medit. El.

*M. longifolia* (L.) Huds.subsp. *typhoides* (Briq.) Harley var. *typhoides* (L.) Huds.

S of Mezra, 28.07.2004, 400 m, river banks, MMB 1146.

*Ziziphora capitata* L.

3 km from Mezra to Adacık village, 11.04.2004, 371 m, steppe, MMB 351, Ir.-Tur. El.

*Z. tenuior* L.

4 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 01.05.2005, 600 m, steppe, MMB 1324/b, Ir.-Tur. El.

*Salvia multicaulis* Vahl

2 km from Bentbahçesi to Bozdere village, 27.03.2005, 490 m, steppe, MMB 1212 & Akan, Ir.-Tur. El.



*S. viridis* L.

Bentbahçesi village, 19.06.2005, 480 m, steppe, MMB 1430, *Medit. El.*

*S. ceratophylla* L.

Adacık village, 24.04.2004, 450 m, in dry valley, MMB 646, *Ir.-Tur. El.*

*S. poculata* Nábelek

5 km from Zeytinbahçe village to Abdallı village, 01.05.2005, 544 m, steppe, MMB 1333, *Ir.-Tur. El.*

## PLANTAGINACEAE

*Plantago atrata* Hoppe

Adacık, 11.04.2004, 350 m, stream sides, MMB 445.

*P. lanceolata* L.

1 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 01.05.2005, 510 m, steppe, MMB 1396.

*P. loeflingii* L.

3 km from Mezra to Adacık village, 11.04.2004, 371 m, steppe, MMB 397.

## ELAEAGNACEAE

*Elaeagnus angustifolia* L.

S of Mezra, 20.06.2005, 450 m, meadows, MMB 1524, *widespread.*

## EUPHORBIACEAE

*Chrozophora tinctoria* (L.) Raf.

S of Mezra, 20.06.2005, 450 m, river banks, MMB 1517.

*Euphorbia chamaesyce* L.

N of Adacık village, Şavi stream, 26.09.2004, 500 m, steppe, MMB 1104, *widespread.*

*E. haussknechtii* Boiss.

Near Zeytinbahçe tumulus, 24.04.2004, 450 m, fallow fields, MMB 541, *Ir.-Tur. El.*

*E. fistulosa* M.S. Khan

3 km from Mezra to Adacık village, 11.04.2004, 371 m, steppe, MMB 361, *Ir.-Tur. El.*

*E. peplus* L. var. *minima* DC.

Between Bentbahçesi village and Tılfar (Bozdere), 27.03.2005, 490 m, steppe, MMB 1246. *E. rigida* Bieb.

5 km from Mezra to Adacık village, 06.06.2004, 430 m, steppe, MMB 895, *Ir.-Tur. El.*

*E. macroclada* Boiss.

1 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 01.05.2005, 510 m, steppe, MMB 1404, *Ir.-Tur. El.*

*E. cheiradenia* Boiss. & Hohen.

Adacık village, 19.06.2005, 430 m, steppe, MMB 1475, *Ir.-Tur. El.*

## URTICACEAE

*Urtica dioica* L.

N of Bentbahçesi village, 480 m, steppe, 11.03.2006, MMB 1548, *Euro.-Sib. El.*

*Parietaria judaica* L.

Akarçay stream, Karakız village, 19.06.2005, 470 m, rocky slopes, MMB 1495, *widespread.*

## MORACEAE

*Ficus carica* L. subsp. *carica* (All.) Schinz & Thell.

Karakız village, 19.06.2005, 470 m, dry valley MMB 1499, *widespread.*

*F. carica* L. subsp. *rupestris* (Hauskn.) Browicz

S of Mezra, 24.04.2004, 450 m, dry valley, MMB 638, *Ir.-Tur. El.*

## ULMACEAE

*Celtis tournefortii* Lam.

S of Zeytinbahçe village, 24.04.2004, 450 m, fallow fields, MMB 491.

## RUBIACEAE

*Asperula orientalis* Boiss. & Hohen.

Şavi stream side, 2 km N of Adacık, 24.04.2004. 430 m, steppe, MMB 605, *Ir.-Tur. El.*

*Galium canum* Req. ex DC. subsp. *canum*

5 km from Mezra to Adacık village, 06.06.2004, 415 m, limestone rocky slopes, MMB 903, *E. Medit. El.*

*G. cassium* Boiss.

Ziyaret hill, 09.05.2004, 560-645 m, steppe, MMB 835, *E. Medit. El.*

**G. spurium** L. subsp. **spurium**

E of Zeytinbahçe village, 27.03.2004, 400 m, roadside, MMB 153, Euro.-Sib. El.

**G. aparine** L.

Near Zeytinbahçe tumulus, 24.04.2004, 450 m, fallow fields MMB 545.

**G. tricornutum** Dandy

S of Mezra, 09.05.2004, 465 m, river banks, MMB 745, Medit. El.

**Cruciata taurica** (Pallas ex Willd.) Ehrend.

E of Zeytinbahçe village, 27.03.2004, 400 m, steppe, MMB 242, Ir.-Tur. El.

**LILIOPSIDA (MONOCOTYLEDONEAE)**

**ARACEAE**

**\*Arum dioscoridis** Sm. var. **luschanii** R.R.Mill

Zeytinbahçe, 11.04.2004, 380 m, moist places, MMB 423, E. Medit. El, Endemic, LC.

**Biarum carduchorum** (Schott) Engl.

N of Adacık village, 26.09.2004, 500 m, steppe, MMB 1118, Ir.-Tur. El.

**B. eximium** (Schott & Kotschy) Engl.

1 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 20.06.2005, 480 m, steppe, MMB 1530, E. Medit. El., Endemic, EN.

**Eminium rauwolffii** (Blume) Schott var. **rauwolffii**

Near Akarçay village, 400 m, steppe, 11.03.2006, Ir.-Tur. El.

**LILIACEAE**

**Asphodelus aestivus** Brot.

N of Bentbahçesi village, 480 m, steppe, 11.03.2006, MMB 1547, Medit. El.

**Allium stamineum** Boiss.

Şavi stream, 19.06.2005, 430 m, steppe, MMB 1479, E. Medit. El.

**A. schergianum** Boiss.

1 km from Mezra to Adacık village, 24.04.2004, 450 m, dry valley, MMB 632, Ir.-Tur. El.

**A. pallens** L. subsp. **pallens**

Zeytinbahçe, 19.06.2005, 450 m, roadside, near Adacık village, 19.06.2005, 430 m, steppe, MMB 1466, Medit. El.

**\*A. myrianthum** Boiss.

4 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 01.05.2005, 600 m, steppe, MMB 1330, Ir.-Tur. El.

**A. scorodoprasum** L. subsp. **rotundum** (L.) Stearn

Between Zeytinbahçe village and Abdallı village, 01.05.2005, 510 m, steppe, MMB 1388, Medit. El.

**A. dictyoprasum** C.A.Mey. ex Kunth

4 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 19.06.2005, 480 m, steppe, MMB 1444, Ir.-Tur. El.

**Ornithogalum montanum** Cirillo

3 km from Mezra to Adacık village, 11.04.2004, 371 m, steppe, MMB 358, E. Medit. El.

**O. ulophyllum** Hand.-Mazz.

3 km from Mezra to Adacık village, 11.04.2004, 371 m, steppe, MMB 366.

**O. nutans** L.

E of Zeytinbahçe village, 27.03.2004, 400 m, steppe, MMB 238 & Akan, E. Medit. El.

**Bellevalia macrobotrys** Boiss.

Between Bentbahçesi and Bozdere village, 27.03.2005, 490 m, fallow fields, MMB 244/b & Akan, Ir.-Tur. El.

**Muscari comosum** (L.) Mill.

N of Adacık, 24.04.2004. 430 m, steppe, MMB 596, Medit. El.

**M. longipes** Boiss.

N of Adacık, 24.04.2004. 430 m, stream sides, MMB 596, Ir.-Tur. El.

**M. neglectum** Guss.

E of Zeytinbahçe village, 27.03.2004, 400 m, steppe, MMB 237 & Akan, widespread.

**Hyacinthella nervosa** (Bertol.) Chouard

Bozdere village, 27.03.2005, 490 m, steppe, MMB 1199 & Akan, Ir.-Tur. El.

**Gagea fibrosa** (Desf.) Schult. & Schult.f.

E of Zeytinbahçe village, 27.03.2004, 400 m, steppe, MMB 196 & Akan.

**G. reticulata** (Pallas) Schult. & Schult.f.

E of Zeytinbahçe village, 27.03.2004, 400 m, steppe, MMB 196 & Akan, Ir.-Tur. El.

**G. chlorantha** (Bieb.) Schult. & Schult.f.

N of Zeytinbahçe village, near graveyard, 26.02.2005, 450 m, steppe, MMB 1160, Ir.-Tur. El.

**Colchicum crocifolium** Boiss.

Ziyaret hill-Abdallı village, 01.05.2005, 550 m, steppe, MMB 1350, Ir.-Tur. El.

**IRIDACEAE****Iris persica** L.

Ziyaret hill-Abdallı village, 01.05.2005, 550 m, steppe, MMB 1351, Ir.-Tur. El.

**Gynandrisis sisyrinchium** (L.) Parl.

Bozdere village, 27.03.2005, 490 m, steppe, MMB 1204.

**Crocus pallasi** Goldb. subsp. **turcicus** Mathew

Ziyaret hill-Abdallı village, 01.05.2005, 550 m, steppe, MMB 1352.

**C. cancellatus** Herb. subsp. **damascenus** (Herb.) B.Mathew

1 km from Mezra to Adacık village, 28.07.2004, 420 m, steppe, MMB 1153, Ir.-Tur. El.

**AMARYLLIDACEAE****Sternbergia fischeriana** (Herb.) Rupr.

N of Bentbahçesi village, Bentbahçesi, upper side, 480 m, steppe, 11.03.2006 (in fruit), MMB 1549.

**Ixiolirion tataricum** (Pallas) Herb. subsp. **tataricum**

NE of Akarçay, 04.04.2004, 450 m, steppe, MMB 312, Ir.-Tur. El.

**I. tataricum** (Pallas) Herb. subsp. **montanum** (Labill.) Takht.

Between Zeytinbahçe village and Abdallı village, 01.05.2005, 510 m, steppe, MMB 1383, Ir.-Tur. El.

**ORCHIDACEAE****Ophrys ferrum-equinum** Desf.

4 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 01.05.2005, 600 m, steppe, MMB 1325, E. Medit. El.

**THYPHACEAE****Typha domingensis** Pers.

Near Adacık village, 26.09.2004, 500 m, river banks, MMB 1065, widespread.

**JUNCACEAE****Juncus articulatus** L.

Şavi stream side, 2 km N of Adacık, 24.04.2004. 430 m, stream sides, MMB 620, Euro.-Sib. El.

**Bolboschoenus maritimus** (L.) Pallas var. **maritimus**

1 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 01.05.2005, 510 m, steppe, MMB 1396.

**CYPERACEAE****Cyperus rotundus** L.

N of Adacık village, Şavi stream, 26.09.2004, 500 m, by stream, MMB 1106.

**C. fuscus** L.

1 km S of Mezra, 20.06.2005, 450 m, meadows, MMB 1525, Euro.-Sib. El.

**Schoenus nigricans** L.

S of Mezra, 20.06.2005, 450 m, meadows, MMB 1526.

**POACEAE (GRAMINEAE)**

**Eremopyrum bonaepartis** (Spreng.) Nevski subsp. **bonaepartis**

5 km from Mezra to Adacık village, 06.06.2004, 430 m, steppe, MMB 882/b.

**Aegilops markgrafii** (Greuter) Hammer

5 km from Mezra to Adacık village, 06.06.2004, 430 m, steppe, MMB 882/a, E. Medit. El.

- A. crassa** Boiss.  
Zeytinbahçe, 01.05.2005, 489 m, steppe, MMB 1310, Ir.-Tur. El.
- A. umbellulata** Zhuk. subsp. *umbellulata*  
Zeytinbahçe stream, 01.05.2005, 489 m, steppe, MMB 1289, Ir.-Tur. El.
- A. triuncialis** L. subsp. *triuncialis*  
5 km from Zeytinbahçe village to Abdalı village, 01.05.2005, 544 m, steppe, MMB 1331.
- A. biuncialis** Vis.  
Near Zeytinbahçe tumulus, 24.04.2004, 450 m, fallow fields, MMB 575.
- Triticum aestivum** L.  
Near Zeytinbahçe tumulus, 24.04.2004, 440 m, steppe, MMB 519.
- Hordeum spontaneum** C.Koch  
Zeytinbahçe tumulus, 24.04.2004, 440 m, MMB 524, Ir.-Tur. El.
- H. marinum** Hudson var. *pubescens* (Guss.) Nevski  
N of Akarçay village, 06.06.2004, 490 m, in fields, MMB 945, Euro.-Sib. El
- H. bulbosum** L.  
Ziyaret hill, 09.05.2004, 560-645 m, steppe, MMB 855/a.
- Bromus japonicus** Thunb. subsp. *japonicus*  
1 km N of Adacık village, 11.04.2004, 350 m, steppe, MMB 455.
- B. squarrosus** L.  
Zeytinbahçe stream, 01.05.2005, 489 m, steppe, MMB 1313.
- B. scoparius** L.  
Zeytinbahçe stream, 01.05.2005, 489 m, steppe, MMB 1318.
- B. danthoniae** Trin.  
3 km from Mezra to Adacık village, 11.04.2004, 371 m, steppe, MMB 335.
- B. tectorum** L.  
S of Zeytinbahçe village, 24.04.2004, 450 m, fallow fields, MMB 494; near Zeytinbahçe tumulus, 24.04.2004, 440 m, MMB 516.
- B. pumilio** (Trin.) P.M.Sm.  
Ziyaret hill, 09.05.2004, 560-645 m, steppe, MMB 848.
- B. sterilis** L.  
Zeytinbahçe stream, 01.05.2005, 489 m, steppe, MMB 1290.
- B. madritensis** L.  
Ziyaret hill, 09.05.2004, 560-645 m, steppe, MMB 842.
- B. tomentellus** Boiss.  
Ziyaret hill, 09.05.2004, 560-645 m, steppe, MMB 855/a, Ir.-Tur El.
- Avena barbata** Pott ex Link subsp. *barbata*  
Zeytinbahçe stream, 01.05.2005, 489 m, steppe, MMB 1300, Medit. El.
- A. sterilis** L. subsp. *ludoviciana* (Durieu) Gillet & Magne  
Near Zeytinbahçe tumulus, 24.04.2004, 430 m, roadside, MMB 481.
- Holcus lanatus** L.  
N of Adacık, 09.05.2004, 415 m, steppe, MMB 776, Euro.-Sib. El
- Polypogon monspeliensis** (L.) Desf.  
5 km from Mezra to Adacık village, Şavi stream side, 06.06.2004, 415 m, stream sides, MMB 908.
- Phleum exaratum** Hochst. ex Griseb. subsp. *exaratum*  
Ziyaret hill, 09.05.2004, 560-645 m, steppe, MMB 834.
- P. boissieri** Bornm.  
Zeytinbahçe, 01.05.2005, 489 m, MMB 1311, Ir.-Tur. El.
- Festuca callieri** (Hack. ex St-Yves) Markgr. subsp. *callieri*  
S of Mezra, 20.06.2005, 450 m, river banks, MMB 1538, widespread.
- Lolium rigidum** Gaudin var. *rigidum*  
3 km from Şanlıurfa-Birecik main road to Bentbahçesi village, 19.06.2005, 480 m, stream sides, MMB 1461.

*Vulpia persica* (Boiss. & Buhse) V.I. Krecz. & Bobrov  
Between Ziyaret hill-Abdallı village, 01.05.2005, 550 m, steppe, MMB 1346, Ir.-Tur. El.

*Echinaria capitata* (L.) Desf.

2 km from Bentbahçesi to Bozdere village, 27.03.2005, 490 m, steppe, MMB 1209 & Akan.

*Poa bulbosa* L.

Zeytinbahçe, 01.05.2005, 489 m, steppe, MMB 1292.

*Melica persica* Kunth subsp. *inaequiglumis* (Boiss.) Bor

NE of Akarçay village, 3 km, 06.06.2004, 430 m, steppe, MMB 958.

*Stipa holosericea* Trin.

Ziyaret hill, 09.05.2004, 560-645 m, rocky limestone slopes, MMB 809, Ir.-Tur. El.

*Phragmites australis* (Cav.) Trin. ex Steud.

S of Mezra, 28.07.2004, 400 m, river banks, MMB 1135/a, Euro.-Sib. El.

*Arundo donax* L.

S of Mezra, 28.07.2004, 400 m, river banks, MMB 1135/b.

*Cynodon dactylon* (L.) Pers. var. *dactylon*

Between Zeytinbahçe village and Akarçay village, 27.03.2004, 400 m, fallow fields, MMB 133.

*Echinochloa crus-galli* (L.) P.Beauv.

Zeytinbahçe village, 26.09.2004, 450 m, fallow fields, MMB 1073.

*Digitaria sanguinalis* (L.) Scop.

Zeytinbahçe village, 26.09.2004, 450 m, fallow fields, MMB 1086.

*Imperata cylindrica* (L.) Raeusch. var. *cylindrica*

1 km S of Mezra, 500 m. 09.05.2004, 465 m, river banks, MMB 723.

*Sorghum halepense* (L.) Pers. var. *muticum* (Hack.) Grossh.

S of Mezra, 20.06.2005, 450 m, river banks, MMB 1538.

*Chrysopogon gryllus* (L.) Trin. subsp. *gryllus*

Between Ziyaret hill and Zeytinbahçe road, 500 m, 09.05.2004, steppe, MMB 871.

## Discussion

This study was carried out with 1450 plant specimens collected over 3 years. As a result of the identification, 62 families, 253 genera, and 442 taxa (subsp. and var. included) were determined from the area. In the flora of the research area, it is determined that 2 taxa belong to Pteridophyta, 1 taxon to Gymnospermae, and 439 taxa to Angiospermae. Of the Angiospermae members, 81 taxa belong to Liliopsida, whereas 359 taxa belong to Magnoliopsida.

One hundred and thirty-seven taxa (30.79%) are Irano-Turanian, 51 (11.46%) are Mediterranean, and 13 (2.92%) are Euro-Siberian phytogeographical region elements. A hundred and ninety-five taxa (54.38%) are distributed in at least 2 phytogeographical regions. The vast number of Irano-Turanian elements can be explained by the fact that the research area lies completely within the Irano-Turanian phytogeographical region. The effects of the Mediterranean and Irano-Turanian phytogeographical regions are seen in the Zeytinbahçe-Akarçay area even though it is located in the transition zone of the Irano-Turanian and Mediterranean phytogeographical regions (Zohary, 1973; Davis, 1975). Moreover, Irano-Turanian elements are abundant, with a rate of 29.9% on Ceylanpınar State Farm (Adıgüzel & Aytaç, 2001), a rate of 39.07% around Kalecik (Aydoğdu & Akan, 2005), a rate of 22.6% around Karkamış Dam Lake (Türkmen et al., 2005), and a rate of 35% on Karacadağ mountain (Ertekin, 2002) (Table 1).

Asteraceae is the largest family, with 68 taxa in the research area, and the others are listed in Table 2. Asteraceae is also the most common family on Karacadağ (Ertekin, 2002) and in the Karkamış Dam area (Türkmen et al., 2005). The family Fabaceae ranks first on Kalecik Mountain (Aydoğdu & Akan, 2005) and on Ceylanpınar State Farm (Adıgüzel & Aytaç, 2001). It may be concluded that the area is parallel to the *Flora of Turkey* since Fabaceae is the second richest family in Turkey. In most floristic studies, Asteraceae and Fabaceae are usually the richest families. This can be explained by the diversity of vegetation types, soil construction, climatic conditions, and topography.

Concerning the number of species, the richest genera in this region are as follows: *Astragalus* (8), *Medicago* (8), *Vicia* (6), *Trigonella* (7), *Euphorbia* (7), *Trifolium* (6), *Centaurea* (5), and *Salvia* (4). The genera with the



Table 1. A comparison of the phytogeographical elements with the neighbouring areas (see captions below for abbreviations).

Research area	Zey.	Karg.	Karc.	Cey.	Kal.
Total taxa	442	464	534	407	238
Irano-Turanian elements %	30.79	22.06	30.5	26.9	38.2
Mediterranean elements %	11.46	14.2	15.4	9.3	8.4
Euro-Siberian elements %	2.92	2.2	2.8	1.6	1.68
Multi-regional elements or those of unknown phytogeographical region %	54.60	51.1	51.3	59.2	51.8

Zey.: C7 Flora of The Region between Zeytinbahce and Akarçay

Karg.: C 6-C 7 Flora of Karkamış Dam Lake (Türkmen et al., 2005)

Karc.: C7 Contribution to the Flora of Karacadağ (Urfa and Diyarbakır Provinces) (Kaynak, 1989a)

Cey.: C7-C8 Flora of Ceylanpınar State Farm (Şanlıurfa) (Adigüzel & Aytaç, 2001)

Kal.: C7 Flora of Kalecik Mountain (Şanlıurfa) (Aydoğdu & Akan, 2005)

Table 2. Comparison of large families with the neighbouring areas.

Research area	Zey.	Karg.	Karc.	Cey.	Kal.
Total taxa	442	464	534	407	238
Asteraceae	68	74	63	52	25
Fabaceae	51	60	63	60	56
Poaceae	40	31	29	45	13
Brassicaceae	24	21	39	22	14
Lamiaceae	23	26	28	21	19
Apiaceae	20	22	32	29	14
Liliaceae	18	11	20	8	5
Boraginaceae	14	11	19	13	7
Scrophulariaceae	12	12	23	16	7
Rosaceae	7	11	11	2	7

biggest number of taxa vary slightly among studies. In our study, the genus *Astragalus* ranks first due to ecological factors and the habitat of the species, which are known as steppic plants of Irano-Turanian phytogeographical regions. The genus *Astragalus* also ranks first on Ceylanpınar State Farm (Adigüzel & Aytaç, 2001), but the genus *Trifolium* ranks first on Karacadağ (Ertekin, 2002). Although *Astragalus* includes the highest number of species in Turkey and features prominently in steppe regions of Irano-Turanian phytogeographical regions, it is not well represented in habitats in some study areas.

The total number of endemic taxa is 16 (3.59%). The endemism rate is 2.4% for Ceylanpınar State Farm (Adigüzel & Aytaç, 2001), and 5.79% for Karacadağ mountain (Ertekin, 2002). The low altitude of the research area and the majority of the land being cultivated are reasons for the low endemism rate on Ceylanpınar State Farm. The endemism rates of Karacadağ mountain and Ceylanpınar State Farm are parallel to that of our research area. Among the endemic plants in our research area, *Cousinia birecikensis* is known only from C7, while *Alkanna trichophila* var.

*mardinensis*, *Arenaria sabulinea*, *Astragalus elongatus* subsp. *nucleiferus*, *Papaver clavatum*, *Verbascum tenue*, and *Hypericum capitatum* var. *capitatum* are known from C6, C7, and C8. These endemic plants are generally localised in the south and south-east Anatolia regions. As regards endemism, south-east Anatolia is the poorest region in Turkey. In fact its climatic, topographic, and ecological features are homogeneous, and most plants grow in the northern parts of Syria and Iraq as well. Therefore, the endemism rate in our study is not high, but some non-endemic plants have restricted ranges, namely *Capparis ovata* var. *palaestina*, *Alcea apterocarpa*, *Hypericum capitatum* var. *capitatum*, *Astragalus aleppicus*, *A. russelii*, *Trigonella mesopotamica*, and *Silene coniflora*.

According to the IUCN Red Data Book categories (Ekim et al., 2000; IUCN Red List Categories and Criteria, 2006), *Cousinia birecikensis* is EN (Adigüzel, 1996), *Biarum eximium* is EN, *Hypericum capitatum* var. *capitatum*, *Scutellaria orientalis* subsp. *porphyrostegia*, and *Verbascum tenue* are VU, *Thymus haussknechtii* is NT, and *Papaver clavatum*, *Arenaria sabulinea*, *Astragalus elongatus* subsp. *nucleiferus*, *Alcea apterocarpa*, *Eryngium bithynicum*, *Anthemis pauciloba* var. *pauciloba*, *Alkanna trichophila* var. *mardinensis*, *Convolvulus galaticus*, *Marrubium parviflorum* subsp. *oligodon*, and *Arum dioscoridis* var. *luschanii* are LC. The populations of endemic plants in the research area have been extensively destroyed by anthropogenic effects; therefore, plants try to survive under unsuitable conditions. Natural habitats have been destroyed during the construction of dams and

tunnels for the irrigation of plains. Therefore, the biological diversity, especially endemic plants, has been affected by the GAP project.

Of all the collected specimens, 30 taxa are new records for the C7 square (Davis, 1965-1985; Davis et al., 1988; Kaynak, 1986, 1987, 1989a, 1989b; Donner, 1990; Yıldırım, 1992, 1994, 1997a, 1997b, 1998, 1999, 2000a, 2000b, 2001a, 2001b, 2004, 2005, 2006; Ertekin & Saya, 1997; Adigüzel & Aytaç, 2001; Ertekin, 2002; Aydoğdu & Akan, 2005; Akan et al., 2005; Türkmen et al., 2005; Parmaksız et al., 2006; Atamov et al., 2007a, 2007b).

The area is one of the richest places of genetic resources for wheat and edible legumes. Some cultivated plants such as *Triticum durum* Desf., *T. turgidum* L., *T. aestivum* L., *Lens culinaris* Medik., *Pisum sativum* L., and *Medicago sativa* L. are common.

*Juglans regia* L., *Vitis vinifera* L., *Morus nigra* L., *Ficus carica* L., and *Pistacia vera* L. are examples of woody plants cultivated in the region.

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