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Contribution to the Flora of Fatik Mountain (Şanlıurfa-Turkey)

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Abstract: The present study, is carried out around Fatik mountain which is located at the South western part of Şanlıurfa. The highest point of the area is 700 m high Hamzan hill. As a result of the research, 162 species of 107 genus of 23 families have been determined. The families with the highest number of species are *Poaceae* (*Gramineae*), *Asteraceae* (*Compositae*), *Fabaceae* (*Leguminosae*), *Lamiaceae* (*Labiatae*), *Apiaceae* (*Umbelliferaceae*) and *Brassicaceae* (*Cruciferae*). Thirty-six taxa (22%) Irano-Turanian, 34 (21.2%) Mediterranean, 4 (2.5%), Euro-Siberian and 1(0.6) Sharo-Indian geographic region elements. The remaining 85 (56.1%) taxa are multi-regional and not from a determined phytogeographic region. The life forms were determined according Raunkiaer. The number of endemic taxa is 2 (1.25%).

Key words: Flora, fatik mountain, Şanlıurfa, Turkey, plant life form

INTRODUCTION

Fatik mountain which located at the South western part of Şanlıurfa. It was selected as study area since it has a peculiar steppe vegetation and less floristical attention has been paid so far as Davis (Adıgüzel Aytaç, 2001) mentioned earlier. The aim of this study is therefore to contribute to the flora of the region where few floristic studies were carried out. The study area is the C7 square according to the grid system adopted by Davis. Phytogeographically located in the Irano-Turanian floristic region, extend between the longitudes of 37.2 N and 37.3 and between the latitudes 38.6 and 38.7 E.

According to the Flora of (Davis, 1965-1985; Davis *et al.*, 1988; Güner *et al.*, 2000) some researchers; among them Kotschy, Sintenis, Davis and Zohary have visited and gathered plant specimens from Şanlıurfa (Baytop, 2003). At the sout-east Anatolia, Some floristic investigation such as The Flora of Ziyaret Mountain in Ergani (Diyarbakır) (Taşkin unpubl. data, 1991), The Flora of Botan Stream (Uluçay) valley in Siirt (Yangın unpubl. data, 2001), The Flora of Eğil town in Diyarbakır (Şülmez unpubl. data 2003), The flora of Kaşmer dağı (Şanlıurfa-Turkey) (Akan *et al.*, 2005). The Flora of Kalecik Mauntain (Aydoğdu and Akan, 2005), Flora of Karacadağ (Şanlıurfa, Diyarbakır) (Ertekin, 2002). Flora of Karkamış Dam Reservoir area and its surrounding (Şanlıurfa, Gaziantep-Turkey), Turkmen *et al.* (2005) have been performed recently but there has been no vegetational research to data except for a study carried out by Zohary (1973). Some floristic and taxonomic studies were carried out around

South-East Anatolia (Adıgüzel and Aytaç, 2001; Aslan and Türkmen, 2001, 2003; Akan *et al.*, 2005; Erteki and Saya, 1997; Ertekin, 1999, 2002; Kaynak and Ketenoglu, 1980, 1986; Kaynak, 1987, 1989a, b; Malyer, 1981, 1983; Türkmen *et al.*, 2002, 2005; Yıldırımliş, 1992, 1994; Yıldız and Aktoklu, 1996), but no regular floristic study has been performed in our research area, Fatik mountain. That's why, the aim of this study was to determine the flora of Fatik mountain and to determine the endemic and rarer plant species. In addition, South East Anatolia is one of the little known or unknown regions of Turkey (Davis, 1975; Çırpıcı, 1987; Donner, 1990). So, area of the present study is included in the little known area. With these objectives, it was expected to contribute to the flora of Şanlıurfa planned to be written in future.

The study area, Fatik mountain, is located in the Irano-Turanian phytogeographic region and is situated in the C7 square and completely located within the province of Şanlıurfa. The Fatik mountain is located on the South West of the Şanlıurfa and it constitutes from three hills. It is very close to steppe hill and it is an important region to represent the floristic composition of the province. The altitude is between 550 and 700 m.

There are three hilly area and a town around the research area. Generally settlements are dense at the foot of the hilly area. The town is mezra; the villages in and around the research area are Köprü hilly area, Dümumenti hilly area and Mezra hilly area (Fig. 1).

Climate: The research area has a semiarid mediterranean climate. According to Emberger the precipitation-temperature coefficient (Q) is 42.94 (Akman, 1990). Annual

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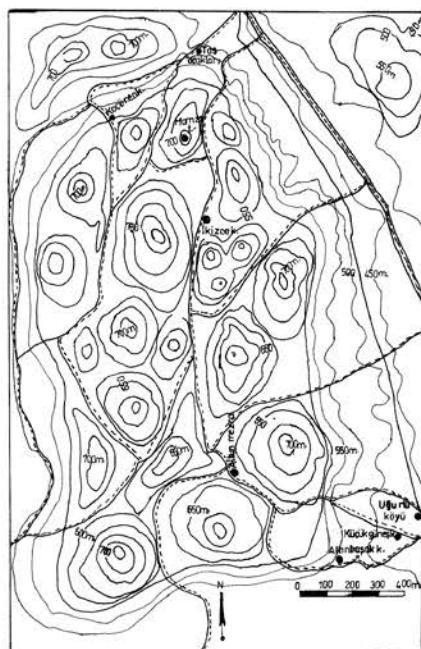


Fig. 1: Geographic map of study area

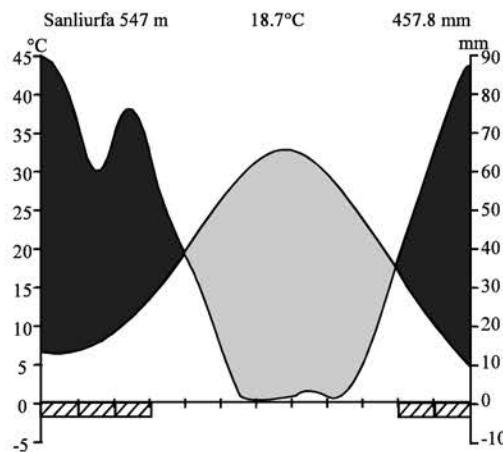


Fig. 2: Ombothermic diagram of Şanlıurfa, Turkey

mean temperature is 18.7°C . The maximum mean temperature (M) is 46.8°C , in July. The minimum mean temperature (m) is -6.8°C , in February. Annual rainfall is about 457.8 mm (Meteorological Bulletin, 1994) and the seasonal precipitation regime is Winter, Spring, Autumn and Summer. This is the first variant of the East Mediterranean precipitation regime. The ombothermic diagram shows dry and rainy period (Fig. 2).

MATERIALS AND METHODS

To constitute study material, 251 plant specimens were gathered from Fatik mountain between 2003 and 2005

during different vegetation seasons. A collector number was given and the specimens were dried according to the standard herbarium methods. The Flora of Turkey and the East Aegean Islands (Davis, 1965-1985; Davis, 1988; Güner *et al.*, 2000; IUCN Species Survival Commission, 2001) were used to identify the plant samples. The flora is listed in the appendix. The list of plants is set out according to the order in the Flora of Turkey. In the floristic list of this article, the following details are given: family name, species name and the author (s), the name of district, habitat of plant, altitude, collection date, collector number, endemism and the phytogeographic region element.

The endemic species were categorized according to IUCN Red data categories (Ekim *et al.*, 2000; IUCN Species Survival Commission, 2001). These abbreviations are given below:

VU-Vulnerable; LC-Least concern; DD-Data deficient.

The area is completely within C7 grid square an Şanlıurfa province, so C7 Şanlıurfa has been omitted from the citations.

The following abbreviations are used in the text:

E: East

Euro.-Sib el.: Euro-Siberian element

Ir.-Tur.el.: Irano-Turanian element

m: meter

Medi el.: Mediterranean element

S: South

subsp. subspecies

var. variety

W: West

End: Endemic

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

Vegetation: In the research area, steppe vegetation is characterised by *Fabaceae*, *Asteraceae* and *Poaceae* members. *Triticum*, *Hordeum*, *Aegilops*, *Anthemis*, *Achillea*, *Centaurea*, *Lathyrus*, *Trifolium*, *Trigonella* and *Medicago* genera are dominated in the study field.

Ficus carica L., *Amygdalus lycioides* Spach. var. *lycioides*, *Crataegus aronia* var. *aronia* (L.) Bosc. ex DC., *Crataegus monogyna* Jacq. subsp. *monogyna* are some trees and shrubs that are spread at intervals.

There are some cultivated fields around the mountain, mainly pistacio, olive, grape and walnut are grown in these fields. The agriculture is based on cereal, essentially wheat and lentil. Moreover, some vegetables are grown, such as tomato, pepper, eggplant. At the same time, pistacio is produced.

RESULTS AND DISCUSSION

This study was carried out using 251 plant specimens collected over a period of 2 years. As a result of the identification of the plant specimens, 23 families, 107 genera and 163 taxa (subs. and var. included) were determined from the area. All species are in the subdivision *Angiospermae*. One hundred and thirty-nine taxa belong to the class *Dicotyledones* and 24 belong to the class *Monocotyledones*.

Thirty-six taxa (22.5%) are Irano-Turanian, 34 (21.2%) Mediterranean 4 (2.5%) Euro-Siberian and 1 (0.6%) Sharo-Indian Pytogeographic region element. Eighty-eight taxa (53.1%) are distributed in at least two Pytogeographic region, their Pytogeographic regions have not been determined. The effect of the Mediterranean and Irano-Turanian Pytogeographic regions are seen in the Fatik mountain even thought it is located in the transition zone of the Irano-Turanian and Pytogeographic regions are seen in the Irano-Turanian and Mediterranean Pytogeographic region (Davis, 1975; Gemici, 1993). The ratio of the Mediterranean Pytogeographic region elements is the lowest in all studies, except for Fatik mountain in which the number of Euro-Siberian-origin taxa is the highest although it is very far from the Euro-Siberian region (Table 1). The distributions of the taxa in the Pytogeographic regions are compared with the taxa in the neighbouring areas and are given in (Table 1). The effects of the Irano-Turanian Pytogeographic region become less away from East Anatolia and the effects of

Table 1: A comparison of the phytogeographic elements

Research area	Fat	Kar.	Kal.	Krd.	Cey.
Total taxa	162.0	464.0	238.0	534.0	407.0
Irano-turanian elements (%)	22.5	22.6	38.2	30.5	26.9
Mediterranean elements (%)	21.2	14.2	8.4	15.4	9.3
Euro-Siberian elements (%)	2.5	2.2	1.68	2.8	1.6
Sharo-Indian elements (%)	0.6	-	-	-	-
Multi-regional elements	52.5	51.1	51.8	51.3	59.2
or those of unknown phytogeographic region (%)					

Fat.: Fatik Mountain; Krd.: Flora of Karacadağ (Şanlıurfa, Diyarbakır); Kal.: Flora of Kalecik Mountain (Şanlıurfa); Kar.: Flora of Karkamış Dam Reservoir area and its surrounding (Şanlıurfa, Gaziantep-Turkey); Cey.: Flora of Ceylanpınar State Farm (Şanlıurfa-Turkey)

the Mediterranean region increase, thought not in Fatik mountain. Palaeopalynologic data shows that Anatolia had a dense vegetation cover in the last interglacial period. In this period, some species of Mediterranean origin migrated into the preponic part of the Mediterranean sea mountains (Toros mountains). These species in the last glacial period were shielded in the tectonic valleys and on the slopes, exposed to the south, to protect themselves from the cool climate (Gemici, 1993) these changes are clearly seen in Fatik mountain.

Poaceae is the largest family with 31 taxa in the research area. The other large families are *Asteraceae* (26 taxa), *Fabaceae* (22), *Lamiaceae* (12), *Apiaceae* (12), *Brassicaceae* (10), *Liliaceae* (9), *Caryophyllaceae* (8) and *Rosaceae* (4 taxa). In this study, *Rosaceae*, which is not among the largest ten families in the Flora of Turkey, is found in the first ten because the plants with a shrub form are common in this area. Also, some families which have perennial species grown on the rocky areas are represented by more species (Table 2).

Astragalus L., *Verbascum* L. and *Centaurea* L. are larger genera in the Flora of Turkey. *Astragalus* is the sixth and *Centaurea* the nine larger, genus in this study area and *Verbascum* is not seen in the first ten floristic list (Appendix). There are large differences in the number of taxa between the Flora of Turkey and this study area. The differences are because of geologic, geomorphologic, climatic, phytogeographic, geographic and adaphic features. Especially, *Centaurea* and *Verbascum* are localised on steppes in the central and eastern parts of Anatolia. In this area, the steppe and rocky place area is very large. Therefore, the number of species from these genera is restricted. The genus *Verbascum*, which is the largest genus in the second genus in the Flora of Turkey, is not seen in the first ten floristic list because this area is stony and bears features of the Mediterranean microclimate (Davis, 1965-1985; Davis *et al.*, 1988; Ekim and Güner, 1986; Ekim, *et al.*, 2000).

Bromus (7 taxa), *Trifolium* (6), *Medicago* (5), *Hordeum* (4), and which grow in rocky places, are the most common genera in the Fatik mountain. However in

Table 2: Comparison of large families in the Fatik mountain and neighboring

Research area	Fat	Kar.	Kal.	Krd.	Cey.
Total taxa	160	464	238	534	407
<i>Asteraceae</i>	74	26	25	63	52
<i>Poaceae</i>	31	31	13	29	45
<i>Fabaceae</i>	22	60	56	63	60
<i>Brassicaceae</i>	10	21	14	39	22
<i>Lamiaceae</i>	12	26	19	28	21
<i>Liliaceae</i>	7	11	5	20	8
<i>Apiaceae</i>	12	22	14	32	29
<i>Rosaceae</i>	3	11	7	11	2
<i>Boraginaceae</i>	1	11	7	19	13
<i>Scrophulariaceae</i>	3	12	6	23	16

Table 3: The rate of endemism in compared research

Research area	Fat	Kar.	Kal.	Krd.	Cey.
Total taxa	162	464	238	534	407
Rate of endemism (%)	1.25	3.1	5.4	5.8	2.4

Table 4: The life form of plants investigated area

Life form	No. of species	Rate (%)
Therophyte (Th)	107	67.8
Hemicryptophyte (H)	36	21.5
Chamaephyte (Ch)	8	4.9
Geophyte (G)	8	4.9
Phanerophyte (Ph)	4	2.4
Total	163	100

the neighboring areas, *Astragalus* is the largest genus. Two out of the 162 taxa are endemic in the research area. The rate of endemism is lower in the areas that are completely in the transition zone (Table 3). This is because the taxa found in these areas are widespread and grow in more than one phytogeographic region.

This study will help in bringing about a better understanding of the flora of Turkey in the future.

According to IUCN Red Data Book Categories (IUCN Species Survival Commission, 2000; Ekim *et al.*, 2000) *Gypsophila antari*, *Eminium rauwolfii* var. *kotschyii*, *Secale sylvestre* and **Hypericum capitatum* var. *capitatum* are VU; *Medicago truncatula* var. *truncatula* is DD and **Centaurea consanguinea* is LC. These species occur in clearings of the cultivated lands. These places are under over grazing. The area is one of richest places for wheat and edible legumes genetic resources. Some cultivated plants such as: *Triticum durum* Desf., *Triticum turgidum* L., *Lens culinaris* Medik originated Near East Gene center.

Taxa can also be classified in their life forms. Raunkier's life form spectrum acts as indicator of the climate or region (Raunkiar, 1934). The life form of the taxa according to Raunkiar are given Table 4.

Table 4 shows that, 107 (67.8%) of species are Therophyte 36 (21.5%) Hemicryptophyte, Chamaephyte 8 (4.9%), Geophyte 8 (4.9%) and Phanerophyte 4 (2.4%)

The number of Therophyte is quite in the area, Which can be explained by the climate and topography of the area. Phanerophyte in shrub form are widespread in the study area because of the effects of the area microclimate.

ACKNOWLEDGMENTS

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APPENDIX

All the taxa were written in same order as in the Flora of Turkey. A list of the vascular plant taxa identified from Fatik mountain are given below:

Spermatophyta

Angiospermae

Dicotyledones

Ranunculaceae

Adonis aestivalis L. subsp. *aestivalis* L.: C7: Fatik mountain, Ikizce village 2 km E., 568 m, steppe, 10.03.2004, Th., Atamov *et al.*, 1077

Anemone coronaria L.: C7: Fatik mountain, Koçören village 1 km W, 600 m, steppe, 29.04.2003, G., Atamov *et al.*, 1197

Ranunculus arvensis L.: C7 Fatik mountain, Ikizce village, 568 m, steppe, 10.03.2004, Th., Atamov *et al.*, 1196

Papaveraceae

Hypecoum imberbe Sibth. and Sm: C7: Fatik mountain, Koçören village, 600 m, steppe, 29.04.2003, Th., Atamov *et al.*, 1198

Hypecoum pendulum L.: C7: Fatik mountain, Uğurlu village, 600 m, steppe, 27.05.2004, Th., Atamov *et al.*, 1104

Roemeria hybrida (L.) D.C.: C7: Fatik mountain, Uğurlu village, 600 m, steppe, 27.05.2004, Th., Atamov *et al.*, 1118

Brassicaceae

Biscutella didyma L.: C7: Fatik mountain, Altun arable field, 500 m, steppe, 05.06.2003, Th., Atamov *et al.*, 1027

Camelina hispida Boiss. var. *hispida* Boiss: C7: Fatik mountain, Koçören village, 600 m, steppe, 29.04.2003, Th., Atamov *et al.*, 1121

Clypeola lappacea Boiss: C7: Fatik mountain, Koçören village 1 km E., 600 m, steppe, 29.04.2003, Th., Ir.-Tur. el. Atamov *et al.*, 1315

***Hymenolobus procumbens* (L.) Nutt. Ex Torrey and Gray:** C7: Fatik mountain, Koçören village, 600 m, steppe, 10.03.2004, Th., Atamov *et al.*, 1107

***Hirschfeldia incana* (L.) Lag.-Foss:** C7: Fatik mountain, Uğurlu village, 600 m, steppe, 27.05.2004, Th., Atamov *et al.*, 1112

***Isatis cochlearis* Boiss:** C7 Fatik mountain, Ikizce village, 568 m, steppe, 10.03.2004, H., Ir.-Tur. el., Atamov *et al.*, 1127

***Lepidium ruderale* L.:** C7: Fatik mountain, Uğurlu village, 600 m, steppe, 27.05.2004, Th., Atamov *et al.*, 1322

***Malcolmia crenulata* (D.C.) Boiss:** C7 Fatik mountain, Ikizce village 1 km W., 568 m, steppe, 10.03.2004, H., Ir.-Tur. el., Atamov *et al.*, 1124

***Sinapis arvensis* L.:** C7: Fatik mountain, Altun arable field, 500 m, steppe, 05.06.2003, Th., Atamov *et al.*, 1116

***Thlaspi perfoliatum* L.:** C7 Fatik mountain, Ikizce village, 568 m, steppe, 10.03.2004, H., Atamov *et al.*, 1125

Caryophyllaceae

***Arenaria leptoclados* (Reichb.) Guss:** C7: Fatik mountain, Uğurlu village, 600 m, steppe, 27.05.2004, Th., Atamov *et al.*, 1226

***Dianthus pallens* Sibth and Sm. var. *oxylepis* Boiss:** C7: Fatik mountain, Uğurlu village, 600 m, steppe, 27.05.2004, H., Atamov *et al.*, 1227

***Gypsophila antari* Post and Beaurverd** VU: C7: Fatik mountain, Hamzan hill 1 km.E., 622 m., steppe, 05.05.2003, Th., Sah.-Arab. el. Atamov *et al.*, 1224

***Holosteum umbellatum* L. var. *umbellatum* L.:** C7: Fatik mountain, Hamzan hill, 622 m, steppe, 05.05.2003, Th., Atamov *et al.*, 1122

***Minuartia hybrida* (Vill.) Schischk. subsp. *turcica* Mcneill:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Atamov *et al.*, 1169

***Silene coniflora* Nees:** C7: Fatik mountain, Hamzan hill, 622 m, steppe, 05.05.2003, Th., Atamov *et al.*, 1120

***Stellaria media* (L.) Vill. subsp. *pallida* (Dumort.) Aschers. and Graebn:** C7: Fatik mountain, Uğurlu village, 600 m, steppe, 27.05.2004, Th., Atamov *et al.*, 1233

***Velezia rigida* L.:** C7: Fatik mountain, Uğurlu village, 600 m, steppe, 27.05.2004, Th., Atamov *et al.*, 1236

Illecebraceae

***Herniaria glabra* L.:** C7: Fatik mountain, Hamzan hill, 622 m, steppe, 05.05.2003, Th., Atamov *et al.*, 1313

Polygonaceae

***Rumex bucephalophorus* L.:** C7: Fatik mountain, Uğurlu village, 600 m, steppe, 27.05.2004, Th., Medit. el., Atamov *et al.*, 1318

Malvaceae

***Althea officinalis* L.:** C7: Fatik mountain, Uğurlu village, 600 m, steppe, 27.05.2004, Th., Atamov *et al.*, 1102

Geraniaceae

***Erodium cicutarium* (L.) L'Herit. subsp. *cicutarium* (L.) L'Herit:** C7: Fatik mountain, Uğurlu village, 600 m, steppe, 27.05.2004, Th., Atamov *et al.*, 1070

Fabaceae

***Astragalus asterias* Stev. ex. Ledeb:** C7: Fatik mountain, Hamzan hill, 622 m, steppe, 05.05.2003, Th., Ir.-Tur. el., Atamov *et al.*, 1256

***Astragalus hamosus* L.:** C7: Fatik mountain, Hamzan hill 1 km E., 622 m, steppe, 05.05.2003, Th., Atamov *et al.*, 1257

***Astragalus strictifolius* Boiss. var. *strictifolius* Boiss:** C7: Fatik mountain, Koçören village, 600 m, steppe, 10.03.2004, Ch., Ir.-Tur. el., Atamov *et al.*, 1260

***Hippocrepis unisiliquosa* L. subsp. *unisiliquosa* L.:** C7: Fatik mountain, Uğurlu village, 600 m, steppe, 29.04.2003, Th., Atamov *et al.*, 1273

***Hymenocarpus circinnatus* (L.) Savi:** C7: Fatik mountain, Uğurlu village 3 km W., 600 m, steppe, 29.04.2003, Th., Medit el., Atamov *et al.*, 1280

***Lathyrus cicera* L.:** C7: Fatik mountain, Uğurlu village, 500 m, stony place, 27.05.2004, Th., Atamov *et al.*, 1293

***Medicago arabica* (L.) Huds:** C7: Fatik mountain, Uğurlu village, 600 m, steppe, 29.04.2003, Th., Atamov *et al.*, 1279

***Medicago constricta* Dur:** C7: Fatik mountain, Ikizce village 1 km E., 568 m, steppe, 10.03.2004, Th., Medit *et al.*; Atamov, 1299

***Medicago minima* (L.) Bart. var. *minima* (L.) Bart:** C7:

Fatik mountain, Uğurlu village, 500 m, stony place, 27.05.2004, Th., Atamov *et al.*, 1283

***Medicago rigidula* (L.) All. var. *rigidula* (L.) All:** C7:

Fatik mountain, Uğurlu village, 500 m, stony place, 27.05.2004, Th., Atamov *et al.*, 1299

***Medicago truncatula* Gaertn. var. *truncatula*:** C7: Fatik mountain, Uğurlu village 3 km W., 500 m, stony place, 27.05.2004, Th., Medit. el., Atamov *et al.*, 1284

***Onobrychis caput-galli* (L.) Lam:** C7: Fatik mountain, Koçören village, 600 m, steppe, 29.04.2003, Th., Medit. el., Atamov *et al.*, 1282

***Trifolium boissieri* Guss. Ex Boiss:** C7: Fatik mountain, Uğurlu village, 500 m, stony place, 29.04.2004, Th., Atamov *et al.*, 1276

***Trifolium campestre* Schreb:** C7: Fatik mountain, Uğurlu village 1 km W., 500 m, stony place, 27.05.2004, Th., Medit. el., Atamov *et al.*, 1290

***Trifolium scabrum* L.:** C7: Fatik mountain, Uğurlu village, 500 m, stony place, 27.05.2004, Th., Atamov *et al.*, 1287

***Trifolium speciosum* Willd:** C7: Fatik mountain, Uğurlu village, 500 m, stony place, 29.04.2004, Th., Atamov *et al.*, 1261

***Trifolium stellatum* L. var. *stellatum*:** C7: Fatik mountain, Uğurlu village, 500 m, stony place, 29.04.2004, Th., Atamov *et al.*, 1263

***Trifolium tomentosum* L.:** C7: Fatik mountain, Uğurlu village, 500 m, stony place, 29.04.2004, Th., Atamov *et al.*, 1271

***Trigonella monspeliaca* L.:** C7: Fatik mountain, Uğurlu village, 500 m, stony place, 29.04.2004, Th., Medit. el., Atamov *et al.*, 1286

***Trigonella spicata* Sibth. and Sm.:** C7: Fatik mountain, Uğurlu village, 500 m, stony place, 29.04.2004, Th., Medit. el., Atamov *et al.*, 1264

***Vicia peregrina* L.:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Atamov *et al.*, 1298

***Vicia villosa* Roth subsp. *villosa* Roth:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Atamov *et al.*, 1258

Rosaceae

***Amygdalus lycioides* Spach. var. *lycioides*:** C7: Fatik mountain, Ikizce village, 500 m, steppe, 26.05.2003, Ph., Ir-Tur. el., Atamov *et al.*, 1129

***Crataegus aronia* var. *aronia* (L.) Bosc. ex DC.:** C7: Fatik mountain, Ikizce village 2 km E, 500 m., steppe, 26.05.2003, Ph., Atamov *et al.*, 1131

***Crataegus monogyna* Jacq. subsp. *monogyna*:** C7: Fatik mountain, Ikizce village, 500 m, steppe, 26.05.2003, Ph., Atamov *et al.*, 1134

***Sanguisorba minor* Scop. subsp. *lasiocarpa* (Boiss. and Hausskn.) Nordb:** C7: Fatik mountain, Uğurlu village, 500 m, stony place, 29.04.2004, H., Atamov *et al.*, 1110

Crassulaceae

***Sedum caespitosum* (Cav.) D.C.:** C7: Fatik mountain, Uğurlu village, 500 m, stony place, 29.04.2004, Th., Medit. el., Atamov *et al.*, 1324

***Sedum nanum* Boiss:** C7: Fatik mountain, Uğurlu village 3 km W., 500 m, stony place, 29.04.2004, Th., Ir-Tur. el., Atamov *et al.*, 1254

Apiaceae

***Ainsworthia trachycarpa* Boiss:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, H., Medit. el., Atamoi *et al.*, 1242

***Biforia radians* Bieb:** C7: Fatik mountain, Uğurlu village, 500 m., steppe, 27.05.2004, Th., Atamov *et al.*, 1202

***Biforia testiculata* (L.) Sprengel ex Schultes:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Atamov *et al.*, 1199

***Bupleurum gerardii* All:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Atamov *et al.*, 1203

***Eryngium creticum* Lam:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Medit. el., Atamov *et al.*, 1253

***Lagoeicia cuminoides* L.:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Medit. el., Atamov *et al.*, 1180

***Orlaya daucoides* (L.) Greuter:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.04.2004, Th., Medit. el., Atamov *et al.*, 1250

***Scandix australis* L. subsp. *grandiflora* (L.) Thell:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 29.04.2004, Th., Atamov *et al.*, 1251

***Scandix pecten-veneris* L.:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 29.04.2004, Th., Atamov *et al.*, 1252

***Tordylium syriacum* L.:** C7: Fatik mountain, Hamzan hill 2 km E., 622 m, steppe, 05.05.2003, Th., Medit. el., Atamov *et al.*, 1200

***Torilis arvensis* (Huds.) Link subsp. *arvensis* (Huds.) Link:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 29.04.2004, H., Atamov *et al.*, 1246

***Torilis leptophylla* (L.) Reichb:** C7: Fatik mountain, Küçük Güneş vilage, 550 m, steppe, 23.06.2003, H., Atamov *et al.*, 1244

***Torilis tenella* (Delile) Reichb:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.04.2004, H., Atamov *et al.*, 1247

Valerianaceae

***Valerianella echinata* (L.) D.C.:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 29.04.2003, Th., Medit. el., Atamov *et al.*, 1307

***Valerianella pumila* (L.) D.C.:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 29.04.2003, Th., Atamov *et al.*, 1302

Dipsacaceae

***Scabiosa argentea* L. :** C7: Fatik mountain, Ikizce village, 500 m, steppe, 26.05.2003, H., Atamov *et al.*, 1325

***Scabiosa calocephala* Boiss:** C7: Fatik mountain, Altun arable field, 500 m, steppe, 05.06.2003, Th., Ir.-Tur. el., Atamov *et al.*, 1306

***Cephalaria syriaca* (L.) Schrader:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Atamov *et al.*, 1311

***Knautia integrifolia* (L.) Bert. var. *bidens* (Sm.) Borbas:** C7: Fatik mountain, Uğurlu village, 500 m., steppe, 27.05.2004, Th., Atamov *et al.*, 1309

Asteraceae

***Achillea vermicularis* Trin:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, H., Ir.-Tur. el., Atamov *et al.*, 1223.

***Anthemis haussknechtii* Boiss. and Reuter:** C7: Fatik mountain, Hamzan hill, 622 m, steppe, 05.05.2003, Th., Medit. el., Atamov *et al.*, 1163

***Carduus pycnocephalus* L. subsp. *albidus* (Bieb.) Kazmi:** C7: Fatik mountain, Koçören village, 600 m., steppe, 29.04.2003, Th., Atamov *et al.*, 1145

***Carduus pycnocephalus* L. subsp. *breviphyllarius* Davis:** C7: Fatik mountain, Koçören village 1 km W., 600 m, steppe, 29.04.2003, Th., Ir.-Tur. el., Atamov *et al.*, 1142

***Carlina vulgaris* L.:** C7: Fatik mountain, Hamzan hill, 622 m, steppe, 05.05.2003, H., Atamov *et al.*, 1144

***Centaurea consanguinea* D.C.:** C7: Fatik mountain, Altun arable field, 500 m, steppe, 05.06.2003, Th., Ir.-Tur. el., End., Atamov *et al.*, 1156

***Centaurea solstitialis* L. subsp. *soltstitialis* L.:** C7: Fatik mountain, Ikizee village, 500 m, steppe, 26.05.2003, Th., Atamov *et al.*, 1176

***Cichorium glandulosum* Boiss. and Huet:** C7: Fatik mountain, Ikizce village, 500 m, steppe, 26.05.2003, Th., Ir.-Tur. el., Atamov *et al.*, 1137

***Cirsium arvense* (L.) Scop. subsp. *vestitum* (Wimmer and Grab.) Petrak:** C7: Fatik mountain, Ikizce village, 500 m, steppe, 26.05.2003, H., Ir.-Tur. el., Atamov *et al.*, 1139

***Crepis foetida* L. subsp. *rhoeadifolia* (Bieb.) Celak:** C7: Fatik mountain, Hamzan hill, 622 m, steppe, 05.05.2003, H., Atamov *et al.*, 1140

***Crepis reuterana* Boiss. subsp. *reuterana* Boiss:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, H., Medit. el., Atamov *et al.*, 1181

***Crepis sancta* (L.) Babcock:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Atamov *et al.*, 1175

***Crupina crupinastrum* (Moris) Vis:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Atamov *et al.*, 1169

***Echinops microcephalus* Sm.:** C7: Fatik mountain, Ikizce village 1 km W., 700 m, steppe, 26.05.2003, Th., Medit el., Atamov *et al.*, 1138

***Gundelia tournefortii* L. var. *armata* Freyn and Sint:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, H., Ir.-Tur. el., Atamov *et al.*, 1179

***Hedypnois cretica* (L.) Dum.-Cours:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Medit el., Atamov *et al.*, 1182, Akd.

***Leontodon crispus* Vill. subsp. *asper* (Waldst. and Kit.) Rohl. var. *setulosus* (Hal.) Kupicha:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, H., Atamov *et al.*, 1185

***Picnomon acarna* (L.) Cass:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Medit el., Atamov *et al.*, 1177

***Pulicaria vulgaris* (L.) Gaertner:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Eur.-Sib. el., Atamov *et al.*, 1159

***Rhagadiolus angulosus* (Jaub. and Spach) Kupicha:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Ir.-Tur. el., Atamov *et al.*, 1173

***Santolina chamaecyparissus* L.:** C7: Fatik mountain, Hamzan hill, 622 m, steppe, 05.05.2003, Ch., Medit el., Atamov *et al.*, 1133

***Scorzonera kotshyi* Boiss.:** C7: Fatik mountain, Hamzan hill, 622 m, steppe, 05.05.2003, H., Medit el., Atamov *et al.*, 1161

***Senecio vulgaris* L.:** C7: Fatik mountain, Ikizce village, 700 m, steppe, 10.03.2004, Th., Atamov *et al.*, 1164

***Tragopogon longirostris* Bisch ex Schultz var. *longirostris* Bisch ex Schultz:** C7: Fatik mountain, Ikizce village 1 km E., 500 m, steppe, 26.05.2003, Th., Atamov *et al.*, 1186

***Xanthium strumarium* L. subsp. *strumarium* L.:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Ir.-Tur. el., Atamov *et al.*, 1168

***Xeranthemum annuum* L.:** C7: Fatik mountain, Hamzan hill, 622 m, steppe, 05.05.2003, Th., Medit el., Atamov *et al.*, 1162

Convolvulaceae

***Convolvulus arvensis* L.:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Ch., Atamov *et al.*, 1079

***Convolvulus cantabrica* L.:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Ch., Atamov *et al.*, 1088

Boraginaceae

***Lappula barbata* (Bieb.) Gürke:** C7: Fatik mountain, Koçören village, 600 m, steppe, 29.04.2003, H., Ir.-Tur. el., Atamov *et al.*, 1316

Scrophulariaceae

***Scrophularia canina* L. subsp. *bicolor* (Sm.) Greuter:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, H., Medit el., Atamov *et al.*, 1097

***Verbascum kotschy* Boiss. and Hohen:** C7: Fatik mountain, Ikizce village, 500 m, steppe, 10.03.2004, Th., Ir.-Tur. el., Atamov *et al.*, 1399

***Veronica beccabunga* L. subsp. *beccabunga* L.:** C7: Fatik mountain, Ikizce village, 500 m., steppe, 10.03.2004, H., Atamov *et al.*, 1320

Lamiaceae

***Lamium macrodon* Boiss. and Huet:** C7: Fatik mountain, Ikizce village, 500 m, steppe, 13.03.2004, Th., Ir.-Tur. el., Atamov *et al.*, 1197

***Marrubium vulgare* L.:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, H., Medit el., Atamov *et al.*, 1194

***Marrubium parviflorum* Fish. and Mey. subsp. *parviflorum* Fish. and Mey.:** C7: Fatik mountain, Altun field, 500 m, steppe, 05.06.2003, H., Ir.-Tur.el., Atamov *et al.*, 1213

***Phlomis bruguieri* Desf.:** C7: Fatik mountain, Hamzan hill, 622 m, steppe, 05.05.2003, H., Ir.-Tur. el, Atamov *et al.*, 1474

***Phlomis kurdica* Rech. Fil:** C7: Fatik mountain, Altun field 3 km E., 500 m, steppe, 05.06.2003, H., Ir.-Tur.el., Atamov *et al.*, 1215

***Salvia sclarea* L.:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, H., Atamov *et al.*, 1189

***Satureja hortensis* L.:** C7: Fatik mountain, Altun field, 500 m, steppe, 05.06.2003, H., Atamov *et al.*, 1206

***Scutellaria tomentosa* Bertol:** C7: Fatik mountain, Altun field, 500 m, steppe, 05.06.2003, H., Ir.-Tur. el., Atamov *et al.*, 1190

***Teucrium polium* L.:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, H., Atamov *et al.*, 1193

***Teucrium parviflorum* Schreber:** C7: Fatik mountain, Altun arable field, 500 m, steppe, 27.05.2004, H., Ir.-Tur. el., Atamov *et al.*, 1211

***Thymbra spicata* L. var. *spicata* L.:** C7: Fatik mountain, Altun arable field, 500 m, steppe, 27.05.2004, Ch., Medit. el., Atamov *et al.*, 1207

***Ziziphora capitata* L.:** C7: Fatik mountain, Koçören village, 600 m, steppe, 29.04.2003, Th., Ir.-Tur. el., Atamov *et al.*, 1208

Euphorbiaceae

***Euphorbia characias* L. subsp. *wulfenii* (Hoppe ex W. Koch.) A.R. Smith:** C7: Fatik mountain, Altun arable field, 500 m, steppe, 05.06.2003, H., Medit. el., Atamov *et al.*, 1069

***Euphorbia denticulata* Lam:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, H., Ir.-Tur. el., Atamov *et al.*, 1067.

***Euphorbia szovitsii* Fisch. and Mey. var. *szovitsii* Fisch. and Mey:** C7: Fatik mountain, Hamzan hill, 622 m, steppe, 05.05.2003, H., Ir.-Tur. el., Atamov *et al.*, 1065

Moraceae

***Ficus carica* L. subsp. *carica* (All.) Schinz and Thell:** C7: Fatik mountain, İkizce village, 568 m, steppe, 13.03.2004, Ph., Atamov *et al.*, 1265

Rubiaceae

***Galium scabiriflorum* (Boiss.) Hausskn:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, H., Medit. el., Atamov *et al.*, 1237

Guttiferae

***Hypericum capitatum* Choisy var. *capitatum* Choisy:** C7: Fatik mountain, Altun arable field, 500 m, steppe, 27.05.2004, H., Ir.-Tur. el., End., Atamov *et al.*, 1201.

Linaceae

***Linum pubescens* Banks and Sol. subsp. *pubescens*:** C7: Fatik mountain, Altun arable field, 500 m, steppe, 27.05.2004, H., Medit. el., Atamov *et al.*, 1200

Monocotyledones (liliopsida)

Araceae

***Eminium rauwolfii* (Blume) Schottt var. *kotschyi* (Boiss.) Busch:** C7: Fatik mountain, Koçören village 2 km E., 600 m, steppe, 29.04.2003, G., Ir.Tur. el., Atamov *et al.*, 1092

Liliaceae

***Allium flavum* L. subsp. *tauricum* (Besser ex Reichb.) Stearn var. *tauricum*:** C7 C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, G., Medit. el., Atamov *et al.*, 1091

***Allium stamineum* Boiss:** C7: Fatik mountain, İkizce village, 500 m, steppe, 03.04.2004, G., Medit. el., Atamov *et al.*, 1093

***Asphodelus aestivus* Brot:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Ch, Medit.. el., Atamov *et al.*, 1170

***Gagea luteoides* Staph:** C7: Fatik mountain, İkizce village, 500 m, steppe, 10.03.2004, G., Atamov *et al.*, 1095

***Hyacinthella nervosa* (Bertol.) Chouard:** C7: Fatik mountain, İkizce village, 500 m, steppe, 03.04.2004, G., Ir.-Tur. el., Atamov *et al.*, 1094

***Urginea maritima* (L.) Baker:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, G., Medit. el., Atamov *et al.*, 1090

***Muscari comosum* (L.) Miller:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, G., Medit. el., Atamov *et al.*, 1180

Poaceae

***Aegilops biuncialis* Vis:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Atamov *et al.*, 1030

***Aegilops cylindrica* Host:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Ir.-Tur. el., Atamov *et al.*, 1011

***Aegilops geniculata* Roth:** C7: Fatik mountain, İkizce village 1 km W., 700 m, steppe, Th., 26.05.2004, Medit. el., Atamov *et al.*, 1031

***Alopecurus myosuroides* Hudson var. *myosuroides* Hudson:** C7: Fatik mountain, Altun arable field, 500 m, steppe, 05.06.2003, Th., Eur.-Sib el., Atamov *et al.*, 1058

***Arrhenatherum kotschyi* Boiss:** C7: Fatik mountain, Altun field, 500 m, steppe, 05.05.2003, Ch., Ir.-Tur.el., Atamov *et al.*, 1064

***Avena eriantha* Durieu:** C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Atamov *et al.* 1020

Avena sterilis L. subsp. *sterilis* L.: C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Atamov *et al.* 1022

Bromus danthoniae Trin: C7: Fatik mountain, Altun arable field 500 m, steppe, 05.06.2003, Th., Atamov *et al.*, 1039

Bromus japonicus Thunb. subsp. *japonicus* Thunb: C7: Fatik mountain, Uğurlu village, 500 m, steppe, 29.04.2004, Th., Atamov *et al.*, 1038

Bromus rubens L.: C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Atamov *et al.*, 1043

Bromus squarrosus L.: C7: Fatik mountain, Hamzan hill, 622 m, steppe, 05.05.2003, Th., Atamov *et al.*, 1040

Bromus sterilis L.: C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Atamov *et al.*, 1046

Bromus tectorum L.: C7: Fatik mountain, Koçören vilage, 600 m, steppe, 29.04.2003, Th., Atamov *et al.*, 1047

Bromus scoparius L.: C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Atamov *et al.*, 1037

Cynodon dactylon (L.) Pers. var. *vilosus* (L.) Pers: C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, H., Atamov *et al.*, 1001

Cynosurus echinatus L.: C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Medit. el., Atamov *et al.* 1014

Echinaria capitata (L.) Desf: C7: Fatik mountain, Hamzan hill, 622 m, steppe, 05.05.2003, Th., Atamov *et al.*, 1006

Eremopyrum bonaepartis (Sprengel) Nevski subsp. *bonaepartis* (Sprengel) Nevski: C7: Fatik mountain, Ikizce village, 500 m, steppe, 13.03.2004, Th., Ir.-Tur. el., Atamov *et al.*, 1034

Festuca callieri (Hackel ex St.-Yves.) F. Markgraf Apud Hayek subsp. *callieri*: C7: Fatik mountain, Hamzan hill, 622 m, steppe, 05.05.2003, H., Atamov *et al.*, 1017

Hordeum bulbosum L.: C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Ch., Atamov *et al.*, 1026

Hordeum geniculatum All: C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Eur.-Sib. el., Atamov *et al.*, 1016

Hordeum murinum L. subsp. *glaucum* (Steudfel) Tzvelev:

C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Atamov *et al.*, 1203

Hordeum spontaneum C. Koch: C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Ir.-Tur. el., Atamov *et al.*, 1017

Lolium multiflorum Lam: C7: Fatik mountain, Altun arable field, 500 m, steppe, 05.06.2003, Th., Atamov *et al.*, 1013

Lolium persicum Boiss. and Hohen ex Boiss: C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Ir.-Tur. el., Atamov *et al.*, 1115

Lolium rigidum Gaudin var. *rigidum* Gaudin: C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Atamov *et al.*, 1204

Phleum phleoides (L.) Karsten: C7: Fatik mountain, Altun arable field, 500 m, steppe, 27.05.2004, H., Eur.-Sib. el., Atamov *et al.*, 1202

Secale sylvestre Host: C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Atamov *et al.*, 1133

Stipa holosericea Trin: C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, H., Ir.-Tur. el., Atamov *et al.*, 1128

Taeniatherum caput-medusae (L.) Nevski subsp. *crinitum* (Schreber) Melderis: C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Ir.-Tur. el., Atamov *et al.*, 1259

Vulpia ciliata Dumort subsp. *ciliata* Dumort: C7: Fatik mountain, Hamzan hill, 622 m, steppe, 05.05.2003, Th., Atamov *et al.*, 1098

Vulpia persica (Boiss. and Buhse) V. Kreez and Bobrov: C7: Fatik mountain, Uğurlu village, 500 m, steppe, 27.05.2004, Th., Ir.-Tur. el., Atamov *et al.*, 1163

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