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## Flora of Pirreşit Mountain (Van, Turkey)\*

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**Abstract:** This paper presents a floristic study of Pirreşit Mountain. The research was carried out in 1997 and 1998, and 3500 vascular plant specimens were collected. After the identification of the specimens, the flora was determined as 820 taxa (at specific and infraspecific ranks) belonging to 767 species, 309 genera, and 65 families. The largest families were Asteraceae (125 taxa), Poaceae (89 taxa), and Fabaceae (72 taxa). The largest genera were *Astragalus* L. (28), *Silene* L. (23), and *Centaurea* L. (16). The phytogeographic elements represented in the study area are as follows: Irano-Turanian 313 (38.2%), Euro-Siberian 78 (9.5%), and Mediterranean 18 (2.2%). When the flora of the area was analysed by Raunkier's life form system, the results were as follows: hemicryptophytes 450 (54.9%), therophytes 161 (19.6%), chamaephytes 80 (9.8%), cryptophytes 116 (14.1%), and phanerophytes 13 (1.6%).

**Key Words:** Flora, Pirreşit Mountain, Van, Turkey

### Pirreşit Dağı (Van - Türkiye) Florası

**Özet:** Pirreşit Dağı'nın florası bu çalışmada sunulmuştur. 1997-1998 yılları arasında gerçekleştirilen bu araştırma esnasında 3500 vasküler bitki örneği toplandı. Toplanan örneklerin teşhisi sonucu 767 tür, 309 cins ve 65 familyaya ait toplam 820 takson (tür ve türaltı kategoriler) belirlendi. En büyük üç familya; Asteraceae (125 takson), Poaceae (89 takson) ve Fabaceae (72 takson)'dir. En büyük cinsler; *Astragalus* L. (28), *Silene* L. (23) ve *Centaurea* L. (16)'dir. Araştırma alanında fitocoğrafi elementlerin dağılımı şöyledir; İran-Turan elementi 313 (% 38,2), Avrupa-Sibirya elementi 78 (% 9,5) ve Akdeniz elementi 18 (% 2,2). Raunkier hayat formu kriterine göre florayı oluşturan bitkilerin hayat formu dağılımı şöyledir; hemikriptofit 450 (% 54,9), terofit 161 (% 19,6), kamefit 80 (% 9,8), kriptomfit 116 (% 14,1) ve fanerofit 13 (% 1,6).

**Anahtar Sözcükler:** Flora, Pirreşit Dağı, Van, Türkiye

### Introduction

Pirreşit Mountain is north-east of Lake Van and within the borders of Van province, which is situated in the Irano-Turanian phytogeographic region. The area is located in the B9 square of the grid system adopted in the *Flora of Turkey* (Davis, 1965). In addition, Pirreşit Mountain has been designated as one of the 122 important plant areas (IPA) of Turkey (Behçet & Ünal, 2005).

The research area is bordered to the north-east by Çaldıran, to the south-east by Özalp, to the west by the Bendimahi River, and to the south by the Karasu River (Figure 1). Zincirli Stream is the main stream in the study

area. It originates from Lake Sultan, located on the northern slopes of Pirreşit Mountain. Pirreşit Peak (3110 m) is the highest summit in the study area. The other important peaks in the study area are Beydağı (2870 m), Köseveli (2600 m), Muradiye (2400 m), and Süphan (2600 m). The altitude of the study area ranges from 1700 m at Muradiye Plain to 3110 m at Pirreşit Peak.

Pirreşit Mountain is a volcanic structure that was formed by andesitic rock during the Pleistocene period (Aktimur et al., 1979). In the area there are 3 main soil types, i.e. brown without lime, chestnut, and alluvial, although the area is mainly covered by the first type (KİB, 1971; KHGM, 1987).

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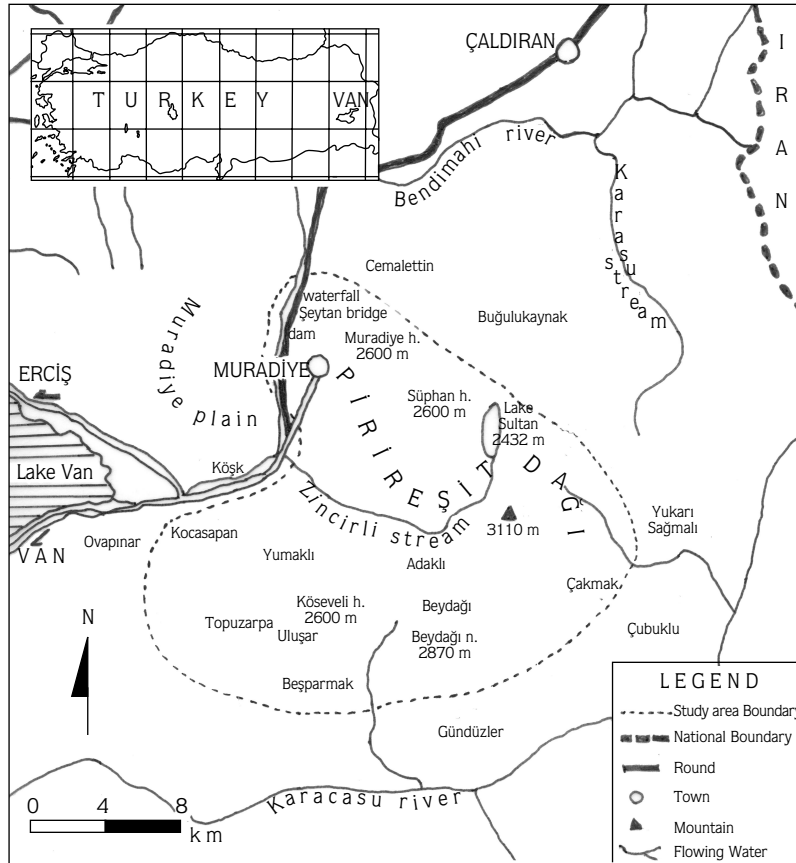


Figure 1. The study area.

The climate of the research area was evaluated using data from the meteorology stations in Muradiye, Çaldıran, and Özalp (DMİGM, 1998).

Based on the precipitation-temperature quotient data obtained from Emberger (1955), bioclimatically the area has a semi-arid, iced-type of Mediterranean climate (Table 1). The precipitation regime in the study area is East Mediterranean Type 2 (spring, winter, autumn, summer) (Akman, 1990).

The natural vegetation of Pirreşit Mountain has been virtually destroyed by anthropogenic factors, such as early and extreme overgrazing, and collection of plant material for fuel. In the research area, forest vegetation is not found, except for a *Salix caprea* L. community north of Adaklı village. *Cotoneaster nummularia* Fisch. & C.A.Mey., *Rosa pulverulenta* M.Bieb., *R. pimpinellifolia* L., *R. montana* Chaix subsp. *woronowii* (Lonacz.) O.Nilsson, *R. canina* L., *Amygdalus communis* L., and *Cerasus*

*microcarpa* (C.A.Meyer) Boiss. subsp. *tortuosa* (Boiss. & Hausskn.) Browicz are examples of trees and shrubs that occur at intervals.

The area contains 3 vegetation types: steppe, meadow, and subalpine-alpine. The largest part of the area is covered by steppes. The steppes can be divided into 2 groups: grass steppes and tragacanth steppes. Within the area the following associations have been recognised by Behçet and Ünal (1999): *Psathyrostachyetum fragili* Behçet & Ünal (in the grass steppes); *Thymo-Astragaletum aurea* Behçet & Ünal (in the tragacanth steppes); *Rumecetum caucasici* Behçet & Ünal, *Heracleetum persici* Behçet & Ünal, and *Caricetum divisae-ovalii* Behçet & Ünal (in the meadow); and *Festuco-Brometum variegati* Behçet & Ünal and *Rumecetum pontici* Behçet & Ünal (in the subalpine-alpine).

Table 1. Climatic data of the meteorological stations.

Station	h	P	M	m	Q	PE	PE/M	Precip. regime	Bioclimate
Muradiye	1706	524.8	30.8	-10.8	45.5	49.7	1.6	Sp, W, A, S	Semi-arid glacial
Çaldıran	2000	551.9	26.4	-23.1	33.2	64.4	2.4	Sp, W, A, S,	Semi-arid glacial
Özalp	2100	393.5	25.5	-16.9	33.4	63.1	2.4	Sp, W, A, S	Semi-arid glacial

h - altitude in m ; P - mean annual precipitation in mm; M - mean temperature (°C) for the hottest month; m - mean temperature (°C) for the coldest month; Q - Emberger's pluviometric quotient:  $2000 P/M^2-m^2$ ; PE: Summer rainfall; PE/M - Emberger's index of xericity; A - Autumn; Sp - Spring; W - Winter; S - Summer.

Crop plants are dominated by *Triticum dicoccon* Schrank, *Citrullus lanatus* (Thunb.) Matsum. & Nakai, and other cultivated plants. Fields in the study area play host to a wide variety of weeds and other therophytes, such as *Arabis nova* Vill., *Malcolmia africana* (L.) R.Braga., *Conringia perfoliata* (C.A.Mey.) N.Busch, *Neslia apiculata* Fisch. & C.A.Mey. & Avé-Lall., *Camelina rumelica* Vell., *Ranunculus arvensis* L., *Holosteum umbellatum* L., and *Vaccaria pyramidata* Medik.

There are numerous wet places fed by underground water or springs characterised by different vegetation, mainly including such grasses as *Glyceria plicata* (Fr.) Fr., *Poa trivialis* L., *Catabrosa aquatica* (L.) P.Beauv., *Phragmites australis* (Cav.) Trin ex Steud., *Carex divisa* Hunds., and *Blysmus copressus* (L.) Panz. ex Link, as well as some dicot plants, such as *Epilobium angustifolium* L., *Veronica anagallis-aquatica* L., *Cirsium arvense* (L.) Scop., and *Valeriana alliarifolia* Adams. A few small streams formed by melting snow originating from the higher altitudes of Pirreşit Mountain are present. These streams join to form the Zincirli Stream and Lake Van.

## Materials and Methods

We collected 3500 vascular plant specimens in 1997 and 1998. These specimens were mainly identified using the *Flora of Turkey* (Davis, 1965-1985; Davis et al., 1988; Güner et al., 2000), other floras (Komarov & Shishkin, 1933-1964; Tutin et al., 1964-1981; Rechinger et al., 1965-1977; Townsend & Evan, 1966-1985; Zohary, 1966-1986), some revisions (Aytaç, 1997; Ekici & Ekim, 2004), and an article (Sutorý, 2004).

Threatened categories are proposed for endemic and some non-endemic taxa according to IUCN risk categories (Ekim et al., 2000; IUCN, 2001). Flora of the area was

analysed by Raunkiaer's life form system (Raunkiaer, 1934).

The order of plant taxa follows that of the *Flora of Turkey* (Davis, 1965-1988). The floristic list is given in the appendix. The first list provides localities of the taxa (the area lies entirely within B9 Van: Muradiye, which is omitted from the citations), followed by habitats, altitudes, collection dates, collectors' names, numbers, life form, endemism, threatened category, and phytogeographic region. The authors of the plant names were checked (Brummitt & Powell, 1992). The floristic list also includes cultivated plants in the area. Cultivated plants are indicated by an asterisk (\*). The symbol (▲) in front of a plant name indicates a new record for the B9 square. All the specimens are kept at VANF.

Abbreviations used in the text and floristic list are as follows: En.: endemic; NT: near threatened; LC: least concern; VU: vulnerable; EN: endangered; E. Medit.: East Mediterranean element; Medit.: Mediterranean element; Euro-Sib.: Euro-Siberian element; Eux.: Euxin element; H. Eux.: Hyrcano-Euxin element; Ir.-Tur.: Irano-Turanian element; T: therophyte; Hk: hemicryptophyte; Kr: cryptophyte; Ka: chamaephyte; Fa: phanerophyte; E: east; N: north; S: south; W: west; MÜ: Murat ÜNAL; Behçet: Lütfi Behçet; VANF: Yüzüncü Yıl University Faculty of Arts and Sciences, Department of Biology Herbarium, Van, Turkey.

## Discussion

Of the 3500 vascular plant specimens collected from the area, 767 species (820 taxa) and 309 genera belonging to 65 families were established. Five species are non-flowering vascular plants and 2 species belong to Gymnosperms, while the other 813 taxa are

Angiosperms, of which 663 are included in dicots and 150 are included in monocots.

Distribution of taxa into the large taxonomical groups in the study is shown in Table 2.

The largest families, based on species number, in the study area are Asteraceae (125 spp.), Poaceae (89 spp.), Fabaceae (72 spp.), Brassicaceae (60 spp.), and Caryophyllaceae (57 spp.). In comparison to the *Flora of Turkey* (Davis et al., 1988), the order of the families is approximately the same in this study. The 10 largest families according to number of species are shown in Table 3.

The richest genera in terms of number of taxa are *Astragalus* L. (28), *Silene* L. (23), *Centaurea* L. (16), *Ranunculus* L. (14), and *Cirsium* Mill. (11). The genus *Astragalus* has c. 2500 taxa worldwide and is one of the

largest genera of flowering plants. Its taxa number in Turkey is 446 (Ekici & Ekim, 2004). The reason *Astragalus* ranks first is that it is the largest genus, represented by the most species in Turkey. Furthermore, the study area is mostly steppe in character. The genera *Centaurea* and *Silene* are the third and fifth largest genera in Turkey, respectively. *Ranunculus* is primarily distributed in humid and wet places, which are very abundant in the study area. *Cirsium* is also relatively widespread throughout Turkey.

The genera with the largest number of species in the study area are shown in Table 4.

The number of endemic taxa in the study area is 69 and the endemism rate is 8.4%, which is below the average in Turkey (34%) (Ekim, 2005). Based on IUCN risk, 84 taxa, all endemics, and 15 non-endemics were

Table 2. The distribution of taxa into the large taxonomical groups.

Plant group	Number of families	Number of genera	Number of taxa
Pteridophyta	3	3	5
Spermatophyta	62	306	816
Gymnospermae	2	2	2
Angiospermae	60	304	813
Dicotyledones	50	244	663
Monocotyledones	10	60	150
<b>Total</b>	<b>65</b>	<b>309</b>	<b>820</b>

Table 3. Total taxa numbers of the largest families found in the study area.

Families	Genera	Taxa
Asteraceae	44	125 (15.2%)
Poaceae	36	89 (10.9%)
Fab Fabaceae	14	72 (8.8%)
Brassicaceae	27	60 (7.3%)
Caryophyllaceae	13	57 (7.0%)
Lamiaceae	16	47 (5.7%)
Boraginaceae	18	35 (4.2%)
Liliaceae	10	34 (4.1%)
Scrophulariaceae	9	32 (3.9%)
Apiaceae	20	29 (3.5%)
Other families	102	240 (29.2%)

Table 4. Taxa totals of the largest genera in the study area.

Genus	Number of taxa
<i>Astragalus</i>	28 (3.4%)
<i>Silene</i>	23 (2.8%)
<i>Centaurea</i>	16 (2.0%)
<i>Ranunculus</i>	14 (1.7%)
<i>Cirsium</i>	11 (1.3%)
<i>Veronica</i>	10 (1.2%)
<i>Allium</i>	10 (1.2%)
<i>Trifolium</i>	10 (1.2%)
<i>Potentilla</i>	10 (1.2%)
<i>Alyssum</i>	10 (1.2%)

evaluated and the results are summarised in Table 5. Fifty-two taxa are placed in the least concern category, while 21 taxa are put in the vulnerable category, 7 taxa are put in the near threatened category, and 4 taxa are put in the endangered category. Threats to taxa in the endangered category are discussed under the related taxa. On the other hand, the main problems for the taxa included in the least concern, vulnerable, and near threatened categories is the collection of plant material, clearing, and over-grazing on the steppes. An updated version of the *Red Data Book* for vascular plants of Turkey was published by Ekim et al. (2000). There are

Table 5. IUCN Red List categories of the flora of Pirreşit Mountain.

Categories	LC	VU	NT	EN	Total
Taxa	52	21	7	4	84

some disagreements among the authors concerning the risk categories for some taxa. This is because they have considered the Turkish flora as a whole, while our observations were based only on the study area. Meanwhile, further floristic studies of the Turkish flora would contribute more to the *Red Data Book*. Another reason for disagreement is that they used the criteria of IUCN 2001; however, newer criteria were used in the paper.

Flora of the study area, categorised according to phytogeographic region, can be listed as follows: Irano-Turanian elements 313 (38.12%) (including 52 endemics), Euro-Siberian elements 78 (7 H. Eux., 11 Eux.) (9.50%) (including 2 endemics), Mediterranean elements 81 (8.7%) (including 1 endemic), and the remaining 412 (50.1%) taxa are cosmopolitan or of unknown phytogeographic origin (Table 6). The dominance of the Irano-Turanian elements would be

Table 6. Comparison of the distribution of phytogeographic elements and endemism rate (%) in the study area and nearby regions (abbreviations are below the table).

The study areas	Irano-Turanian	Euro-Siberian	Mediterranean	Cosmopolitan and others	Endemism
Pirreşit Mountain	38.1	9.5	2.1	50.1	8.8
Erek Mountain	42.8	9.9	3.1	44.2	7.8
Bitlis River	31.8	4.8	8.7	54.6	6.8
Hizan	34.9	6.2	4.7	54.2	7.9
Süphan	37	8.7	2	52.3	8.5
Kurubaş	44	7	1	47	7
Toprakkale	44	4.4	4.8	46.8	4
Çakmak	33.9	20	2.6	37.2	6.5
Terc. Bağır.	25	10.7	4.4	59.9	6.5
Munzur	45.7	8	4.4	41.9	19.9
Çiçek	12.6	29.6	1	56.8	3
Allahuekber	37	41.3	1.6	20.1	4.6
Iğdır	44.4	7.7	3.5	44.4	1.4

Abbreviations:

Pirreşit Dağı: Flora of Pirreşit Dağı

Erek Dağı: Erek Dağı (Van) Florası Üzerinde Çalışmalar (III) (Özçelik & Babaç, 1993)

Bitlis River : The Flora of Bitlis River Valley (Altıok & Behçet, 2005)

Hizan: Hizan (Bitlis) Florası (Altan & Behçet, 1995)

Süphan: Süphan Dağı (Bitlis) Florası (Behçet, 1989)

Kurubaş: Kurubaş Geçidi (Van) Florası (Öztürk & Behçet, 1998)

Toprakkale: Toprakkale (Van) Florası (Öğün & Altan, 1992)

Çakmak: Çakmak Dağları (Ağrı) Florası (Gümüş, 1992)

Terc.-Bağır.: Tercan Çevresi ve Şengül (Erzincan) ve Bağır Baba (Tunceli) Dağlarının Florası (Kaya, 1996)

Munzur: Munzur Dağları (Erzincan-Tunceli) Florası (Yıldırım, 1995)

Çiçek: Çiçek Dağı (Posof-Kars) Florası (Demirkuş, 1994)

Allahuekber: Allahuekber Dağları (Erzurum) Florasına Katkılar (Tatlı, 1989)

Iğdır: Iğdır Ovası (Iğdır) Florasına Katkılar (Tatlı & Atlan, 1987)

expected because the study area lies in the Irano-Turanian region. Similar results were obtained from other floristic studies in East Anatolia, close to Pirreşit Mountain (Table 6). The Irano-Turanian elements seem to be dominant in all areas studied, while the Euro-Siberian elements come in second in all these areas, except Allahuekber Mountain (Tatlı, 1989), the Bitlis River Valley (Altıok & Behçet, 2005), and Toprakkale (Öğün & Altan, 1992).

The taxa can also be classified according to their life forms. Raunkiaer's life forms spectrum functions as an indicator of the climate or region (Raunkiaer, 1934; Akman & Ketenoglu, 1992). The life forms of the taxa, according to Raunkiaer, are represented in the study area as follows: 450 (54.9%) taxa are hemicryptophytes, 167 (19.6%) taxa are therophytes, 116 (14.1%) taxa are

cryptophytes (also called geophytes), 80 (9.8%) taxa are chamaephytes, and 13 (1.6 %) taxa are phanerophytes.

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## APPENDIX

### The Floristic List

#### PTERIDOPHYTA

##### EQUISETACEAE

###### *Equisetum ramosissimum* Desf.

Around Adaklı village, stream bank, 2300 m, 22 vii 1998, *MÜ* 4569. Kr.

###### *E. fluviatile* L.

Muradiye Waterfall, stream sides, 1800 m, 18 x 1997, *MÜ* 2131. Kr.

###### *E. arvense* L.

Pirreşit Mountain, near summit, alpine steppe, 3000 m, 30 vi 1998, *MÜ* 3147. Kr.

#### ASPLENIACEAE

##### *Asplenium ceterach* L. subsp. *ceterach*

Pirreşit Mountain, south-west slopes, 2000 m, 12 ix 1997, *MÜ* 2312. Kr.

#### ATHYRIACEAE

##### *Cystopteris fragilis* (L.) Bernh.

Between Adaklı village and Adaklı valley, rocky area, 2400 m, 19 v 1998, *MÜ* 2444. Hk.

#### SPERMATOPHYTA

##### GYMNOSPERMAE

##### PINACEAE

###### \**Pinus sylvestris* L.

Around Muradiye Dam, stream side, 1800 m, 29 vi 1997, *MÜ* 1438. Fh.

#### EPHEDRACEAE

##### *Ephedra major* Host

Yumaklı valley, south slopes, steppe, 2200 m, 19 x 1997, *MÜ* 2251. Kh.

#### ANGIOSPERMAE

##### DICOTYLEDONES

##### RANUNCULACEAE

###### *Caltha polypetala* Hochst. ex Lorent

Between Adaklı village and Sultan Lake, meadow, 1800-2500 m, 11 vii 1997, *MÜ* 1544. Hk.

###### *Delphinium albiflorum* DC.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3347. Hk.

###### *D. carduchorum* Chowdhuri & P.H.Davis

Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1887. Hk. En.-LC, Ir.-Tur.

###### *D. cyphoplectrum* Boiss.

Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *Behçet* 1668. Hk. En.-LC.

###### *Consolida scleroclada* (Boiss.) Schröd. var. *rigida* (Frey & Sint.) P.H.Davis

Around Muradiye Waterfall, stream side, 1800 m, 18 x 1997, *MÜ* 2127. T.

###### *C. orientalis* (Gay) Schöd.

Around Muradiye Waterfall, between steppe areas and fields, 1800 m, 29 vi 1997, *MÜ* 1471. T.

###### *Adonis aestivalis* L. subsp. *aestivalis*

Around Topuzarpa village, meadow, 1740-1900 m, 24 v 1997, *MÜ* 1188. T.

###### *Ranunculus fenzlii* Boiss.

Around Adaklı village, meadow, 2400 m, 10 v 1998, *MÜ* 2377. Kr. En.-LC, Ir.-Tur.

###### *R. repens* L.

Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1906. Hk.

###### *R. polyanthemus* L.

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 2897. Hk.

###### *R. kotschyi* Boiss.

Around Topuzarpa village, meadow, 1740-1900 m, 24 v 1997, *MÜ* 1196. Hk.

###### *R. constantinopolitanus* (DC.) d'Urv.

Between Adaklı village and Adaklı high-plateau, steppe, 2650 m, 06 vi 1998, *MÜ* 2629. Hk.

###### *R. polyrhizos* *Steph.* ex Willd.

Pirreşit Mountain, south slopes, 2400 m, 08 vi 1997, *MÜ* 1343. Hk. Euro-Sib.

###### *R. argyreus* Boiss.

Around Adaklı village, meadow, 2400 m, 06 vi 1998, *MÜ* 2851. Hk.

###### *R. illyricus* L. subsp. *illyricus*

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 4015. Hk.

###### *R. macrorhynchus* Boiss. subsp. *trigonocarpus* (Boiss.) P.H.Davis

Between Adaklı village and Sultan Lake, meadow, 2400 m, 10 v 1998, *MÜ* 2419. Hk. Ir.-Tur.

###### *R. isthmicus* Boiss. subsp. *stepporum* P.H.Davis

Around Adaklı village, steppe, 2400 m, 06 vi 1998, *MÜ* 2574. Kr.

###### *R. arvensis* L.

Pirreşit Mountain, fields, 2400 m, 08 vi 1997, *MÜ* 1231. T.

###### *R. strigillosus* Boiss. & É.Huet

Between Beşparmak and Çakmak villages, meadow, 2600 m, 02 vii 1998, *MÜ* 4329. Hk.

###### *R. kochii* Ledeb.

Around Topuzarpa village, steppe, 1750 m, 14 iv 1997, *MÜ* 1000. Kr. Ir.-Tur.

###### *R. trichopyllus* *Chaix*

Between Adaklı village and Sultan Lake, in the water, 1800-2500 m, 11 vii 1997, *MÜ* 2343. Kr.

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

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 3044. T.

###### *Thalictrum flavum* L.

Around Beşparmak village, steppe, 2300-2450 m, 17 vii 1997, *MÜ* 1615. Kr.

#### BERBERIDACEAE

##### *Leontice leontopetalum* L. subsp. *ewersmannii* (Bunge) Coode

Korug district, steppe, 1716-1730 m, 01 v 1997, *MÜ* 1061. Kr.

#### PAPAVERACEAE

##### *Glaucium haussknechtii* Bornm. & Fedde

Muradiye Waterfall, between steppe areas and fields, 1800 m, 29 vi 1997, *MÜ* 1479. Hk. VU. Ir.-Tur.

This species is known from few localities in Turkey and Iran. The habitat is under threat from over-grazing and field clearing.

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

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 28 vi 1998, *MÜ* 3216. T.

**R. refracta** DC. subsp. *occidentalis* Kadereit

Between Topuzarpa and Uluşar villages, meadow, 1750 m, 24 v 1997, *MÜ* 1217.

T. Ir.-Tur.

**Papaver orientale** L.

Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1876. Hk.

**P. bracteatum** Lindl.

Yakıncak valley, south slopes, steppe, 1800 m, 07 vi 1997, *MÜ* 1294. Hk.

**P. fugax** Poir. var. *platydiscus* Cullen

Around Beşparmak village, steppe, 2300-2450 m, 17 vii 1997, *MÜ* 1682. Hk. En.-LC, Ir.-Tur.

**P. cylindricum** Cullen

Between Topuzarpa village and Karaoğlan district, steppe, 1900 m, 19 x 1997, *MÜ* 1254. Hk. Ir.-Tur.

**P. macrostomum** Boiss. & É.Huet ex Boiss.

Pirreşit Mountain, south slopes, steppe, 2400 m, 08 vi 1997, *MÜ* 1396. T. Ir.-Tur.

**P. arenarium** M.Bieb.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 28 vi 1998, *MÜ* 3192. T.

**P. argemone** L.

Between Topuzarpa and Uluşar villages, meadow, 1750 m, 24 v 1997, *MÜ* 1216. T.

**Corydalis oppositifolia** DC. subsp. *oppositifolia*

Between Topuzarpa and Uluşar villages, meadow, 1750 m, 24 v 1997, *MÜ* 1006. Kr.

**C. rutifolia** (Sibth. & Sm.) DC. subsp. *kurdica* Cullen & P.H.Davis

Around Adaklı village, meadow, 2400 m, 10 v 1998, *MÜ* 2365. Kr. En.-LC, Ir.-Tur.

**Fumaria microcarpa** Boiss. ex Hausskn.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 28 vi 1998, *MÜ* 3546. T.

**F. asepala** Boiss.

Pirreşit Mountain, south-west slopes, steppe, 2200 m, 19 x 1997, *MÜ* 2209. T. Ir.-Tur.

## BRASSICACEAE (CRUCIFERAE)

**Crambe orientalis** L. var. *orientalis*

Muradiye Castle, steppe, 1820 m, 29 vi 1997, *MÜ* 1990. Hk. Ir.-Tur.

**Conringia perfoliata** (C.A.Mey.) N.Busch

Between Adaklı village and Adaklı high-plateau, steppe, 2650 m, 06 vi 1998, *MÜ* 2868. T.

**Lepidium perfoliatum** L.

Between Topuzarpa and Uluşar villages, meadow, 1750 m, 24 v 1997, *MÜ* 1215. Hk.

**L. latifolium** L.

Muradiye Waterfall, steppe areas between fields, 1800 m, 29 vi 1997, *MÜ* 1478. Hk.

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

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 2945. Hk.

**C. draba** (L.) Desv. subsp. *chalepensis* (L.) O.E.Schulz.

Around Topuzarpa village, steppe, 1740-1900 m, 24 v 1997, *MÜ* 1187. Hk.

**Isatis steveniana** Trautv.

Between Beşparmak village and Köseveli Hill, meadow, 2400 m, 17 vii 1997, *MÜ* 1910. Hk. Ir.-Tur.

**I. undulata** Aucher ex Boiss.

Pirreşit Mountain, near summit, alpine steppe, 3000 m, 30 vi 1998, *MÜ* 3144. Hk. En.-EN, Ir.-Tur.

The taxon is rare and its habitat in the area is under threat of over-grazing and field clearing.

**I. aucheri** Boiss.

Between Adaklı village and Sultan Lake, meadow, 2500 m, 28 vi 1998, *MÜ* 4143. Hk. En.-LC, Ir.-Tur.

**I. takhtajanii** Avet.

Between Beşparmak village and Köseveli Hill, steppe, 2400 m, 17 vii 1997, *MÜ* 1719. Hk. Ir.-Tur.

**Physocardamum davisii** Hedge

Pirreşit Mountain, south slopes, steppe, 2400 m, 08 vi 1997, *MÜ* 1402. Hk. En.-VU, Ir.-Tur.

This species is a member belonging to *Physocardamum* Hedge, which is an endemic and monotypic genus.

**Aethionema arabicum** (L.) Andr. ex DC.

Between Beşparmak village and Köseveli Hill, steppe, 2400 m, 17 vii 1997, *MÜ* 1801. T.

**A. trinervium** (DC.) Boiss.

Between Adaklı village and Adaklı high-plateau, steppe, 2650 m, 06 vi 1998, *MÜ* 2765. Hk.

**A. membranaceum** DC.

Between Beşparmak village and Köseveli Hill, field, 2400 m, 17 vii 1997,

*MÜ* 1810. Hk. Ir.-Tur.

**A. grandiflorum** Boiss. & Hohen.

Between Adaklı village and Adaklı high-plateau, steppe, 2650 m, 06 vi 1998, *MÜ* 2765. Hk. Ir.-Tur.

**Thlaspi arvense** L.

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 2899. T.

**T. perfoliatum** L.

Between Topuzarpa and Uluşar villages, steppe, 1740 m, 30 iv 1997, *MÜ* 1021. T.

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

Between Yakıncak and Yumaklı villages, meadow, 1800 m, 11 v 1997, *MÜ* 1078. T.

**C. rubella** Reut.

Around Topuzarpa village, steppe, 1750 m, 14 iv 1997, *MÜ* 1005. T. Medit.

**Euclidium syriacum** (L.) R.Br.

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 2859. T.

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

Muradiye Waterfall, stream side, 1726-1800 m, 17 v 1997, *MÜ* 1133. T.

**Peltariopsis planisiliqua** (Boiss.) N.Busch

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 2907. T. Ir.-Tur.

In *Flora of Turkey* it was indicated that the colour of petals may be white. However, in the key of the genus the colour of flowers was given as red-purple, livid, or violet. The contradiction makes the identification of species difficult.

**Fibigia macrocarpa** (Boiss.) Boiss.

Around Yumaklı valley, south slopes, rocky area, 2200 m, 19 x 1997, *MÜ* 2244. Hk.

**Alyssum linifolium** Stephen ex Willd. var. *linifolium*

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 3032. T.

**A. alyssoides** (L.) L.

Between Adaklı village and Adaklı high-plateau, steppe, 2400 m, 19 v 1998, *MÜ* 2474. Hk.

**A. dasycarpum** Stephen ex Willd. subsp. *dasycarpum*

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 3065. T.

**A. desertorum** Stapf var. *desertorum*

Between Yumaklı and Beydağı villages, steppe, 1750-1900 m, 11 v 1997, *MÜ* 1073. T.

**A. desertorum** Stapf var. *prostratum* T.R.Dudley

Around Karaoğlan district, rocky slopes, 1716 m, 27 iv 1997, *MÜ* 1015. T.

**A. strictum** Willd.

Muradiye Mountain, west slopes, steppe, 1900 m, 09 v 1998, *MÜ* 2340. T. Ir.-Tur.

**A. minus** (L.) Rothm. var. *minus*

Pirreşit Mountain, south slopes, steppe, 2400 m, 08 vi 1997, *MÜ* 1418. T.

**A. minus** (L.) Rothm. var. *micranthum* (C.A.Mey.) T.R.Dudley

Around Adaklı village, meadow, 2400 m, 10 v 1998, *MÜ* 2407. T.

**A. strigosum** Banks & Sol. subsp. *strigosum*

Between Topuzarpa and Uluşar villages, steppe, 1750 m, 24 v 1997, *MÜ* 1209. T.

**A. pateri** Nyár. subsp. *pateri*

Between Yakıncak and Yumaklı villages, steppe, 1800 m, 11 v 1997, *MÜ* 1104. Hk. En.-LC. Ir.-Tur.

**Draba bruniifolia** Steven subsp. *bruniifolia*

Pirreşit Mountain, south slopes, rocks, 2400 m, 08 vi 1997, *MÜ* 1381. Kh.

**D. nemorosa** L.

Around Adaklı village, steppe, 2400 m, 06 vi 1998, *MÜ* 2693. T.

**D. hueti** Boiss.

Muradiye Mountain, west slopes, steppe, 1900 m, 09 v 1998, *MÜ* 2351. T.

**Arabis caucasica** Willd. subsp. *caucasica*

Korug district, steppe, 1716-1730 m, 01 v 1997, *MÜ* 1047. Hk.

**A. caucasica** Willd. subsp. *brevifolia* (DC.) Cullen

Muradiye Mountain, west slopes, steppe, 1900 m, 09 v 1998, *MÜ* 2347. Hk. Medit.

**A. nova** Vill.

Between Yakıncak and Yumaklı villages, steppe, 1800 m, 11 v 1997, *MÜ* 1080. T.

**A. montbretiana** Boiss.

Muradiye Mountain, west slopes, steppe, 1900 m, 09 v 1998, *MÜ* 2338. T. Ir.-Tur.

**Nasturtium officinale** R.Br.

Yumaklı valley, stream side, 2200 m, 19 x 1997, *MÜ* 2267. Kr.

**Barbarea plantaginea** DC.

Muradiye Waterfall, stream side, 1726-1800 m, 17 v 1997, *MÜ* 1112. Hk.

**B. minor** C.Koch var. *minor*

Between Topuzarpa and Uluşar villages, meadow, 1750 m, 24 v 1997, *MÜ* 1202. Hk.

**B. minor** C.Koch var. *robusta* Cullen & Coode

Between Adaklı village and Sultan Lake, meadow, 2250 m, 11 v 1997, *MÜ* 1085. Hk. En.-LC.

**Cardamine tenera** C.C.Gmel.

Between Adaklı village and Sultan Lake, meadow, 1800-2500 m, 11 vii 1997, *Behçet* 5693a. Hk. H.Eux.

**C. uliginosa** M.Bieb.

Between Beşparmak and Çakmak villages, meadow, 2600 m, 02 vii 1998, *MÜ* 4257. Kr.

**Drabopsis verna** C.Koch

Between Yakıncak and Yumaklı villages, steppe, 1800 m, 11 v 1997, *MÜ* 1079. T. Ir.-Tur.

**Chorispora tenella** (Pall.) DC.

Korug district, steppe, 1716-1730 m, 01 v 1997, *MÜ* 1048. T.

**Malcolmia africana** (L.) R.Braga

Around Muradiye Dam, steppe, 1740 m, 27 iv 1997, *MÜ* 1137. T.

**Sterigmostemum incanum** M.Bieb.

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 2915. Hk. Ir.-Tur.

**Erysimum pulchellum** (Willd.) Gay

Between Topuzarpa and Uluşar villages, meadow, 1750 m, 24 v 1997, *MÜ* 1201. Kh.

**E. sintenianum** Bornm.

Around Adaklı village, meadow, 2400m, 06 vi 1998, *MÜ* 2870. Hk. En.-LC. Ir.-Tur.

**E. crassipes** Fisch. & C.A.Mey.

Muradiye Castle, steppe, 2152 m, 28 vi 1997, *MÜ* 1443b. Hk.

**E. smyrnaeum** Boiss. & Ball

Pirreşit Mountain, south slopes, 1800 m, 07 vi 1997, *MÜ* 1293. Hk.

**E. repandum** L.

Around Kocasapan village, fields, 1750-1800 m, 30 iv 1997, *MÜ* 1022. T.

**Sisymbrium altissimum** L.

Yakıncak valley, south slopes, 1800 m, 07 vi 1997, *MÜ* 1259. Hk.

**S. loeselii** L.

Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1663. T.

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

Between Beşparmak village and Köseveli Hill, meadow, 2400 m, 17 vii 1997, *MÜ* 1857. T.

**Camelina rumelica** Vell.

Muradiye Mountain, west slopes, steppe, 1900 m, 09 v 1998, *MÜ* 2337. T.

**RESEDACEAE**

**Reseda lutea** L. var. *lutea*

Between Muradiye town and Yakıncak village, field edges, steppe, 1800 m, 18 x 1997, *MÜ* 2097. Hk.

## CISTACEAE

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

Around Karaoğlan district, meadow, 1800 m, 07 vi 1997, *MÜ* 1264. T.

## VIOLACEAE

*Viola occulta* Lehm.

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 3050. T.

## POLYGALACEAE

*Polygala anatolica* Boiss. & Heldr.

Between Beşparmak and Çakmak villages, meadow, 2600 m, 02 vii 1998, *MÜ* 4321. Hk.

## CARYOPHYLLACEAE

*Arenaria cucubaloides* Sm.

Between Beşparmak village and Köseveli Hill, meadow, 2400 m, 17 vii 1997, *MÜ* 1757. Kh. Ir.-Tur.

*A. dianthoides* Sm.

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 3026. Hk. Ir.-Tur.

*A. gypsophiloides* L. var. *gypsophiloides*

Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1660. Hk. Ir.-Tur.

*A. gypsophiloides* L. var. *glabra* Fenzl

Pirreşit Mountain, near summit, alpine steppe, 3000 m, 27 vi 1997, *MÜ* 1961. Hk. Ir.-Tur.

*A. holostea* M.Bieb. subsp. *macrantha* (Schischk.) McNeill

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 2970. Hk. Ir.-Tur.

*Minuartia lineata* Bornm.

Between Adaklı village and Adaklı high-plateau, steppe, 2650 m, 06 vi 1998, *MÜ* 2628. Hk. Ir.-Tur.

*M. hamata* (Hausskn.) Mattf.

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 2974. T.

*M. anatolica* (Boiss.) Woronow var. *polymorpha* McNeill

Between Beşparmak and Çakmak villages, steppe, 2000 m, 30 vi 1998, *MÜ* 4382. Kh.

*M. corymbulosa* (Boiss. & Ball) McNeill var. *corymbulosa*

Pirreşit Mountain, near summit, alpine steppe, 3000 m, 28 vi 1998, *MÜ* 3191b. Hk. En.-NT. Ir.-Tur.

*Stellaria persica* Boiss.

Between Adaklı village and Sultan Lake, meadow, 2500 m, 28 vi 1998, *MÜ* 4091. Hk.

*Cerastium anomalum* Waldst. & Kit Tan

Between Adaklı village and Adaklı high-plateau, steppe, 2650 m, 06 vi 1998, *MÜ* 2534. T.

*C. kotschyi* Boiss.

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 3005. T. VU.

*C. gnaphalodes* Fenzl

Between Adaklı village and Adaklı high-plateau, steppe, 2650 m, 06 vi 1998, *MÜ* 2725. T. En.-LC.

*C. araraticum* Rupr.

Pirreşit Mountain, south slopes, meadow, 2400 m, 08 vi 1997, *MÜ* 1391a, Hk. En.-LC. Ir.-Tur.

*C. purpurascens* Adams

Between Adaklı village and Sultan Lake, meadow, 2500 m, 28 vi 1998, 28 vi 1998, *MÜ* 4214. Hk.

*C. dichotomum* L. subsp. *dichotomum*

Around Topuzarpa village, steppe, 1740-1900 m, 24 v 1997, *MÜ* 1205. T.

*C. longifolium* Willd.

Adaklı village, meadow, 2400 m, 10 v 1998, *MÜ* 2376. T. Ir.-Tur.

*C. semidecandrum* L.

Between Adaklı village and Adaklı high-plateau, steppe, 2400 m, 19 v 1998, *MÜ* 2467. T.

*Holosteum umbellatum* L. var. *umbellatum*

Between Yumaklı and Beydağı villages, steppe, 1750-1900 m, 11 v 1997, *MÜ* 1049. T.

*H. umbellatum* L. var. *glutinosum* (M.Bieb.) Gay

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3323. T.

*Sagina procumbens* L.

Between Beşparmak and Çakmak villages, meadow, 2600 m, 02 vii 1998, *MÜ* 4300. T.

*Telephium imperati* L. subsp. *orientale* (Boiss.) Nyman

Between Muradiye town and Yumaklı village, steppe, 1716 m, 06 x 1998, *MÜ* 3221. Hk.

*T. oligospermum* Steud. ex Boiss.

Pirreşit Mountain, south slopes, alpine steppe, 3000 m, 17 vii 1997, *MÜ* 1918. Hk. Ir.-Tur.

*Dianthus inamoenus* Schischk.

Between Muradiye town and Yakıncak village, field edges, 1800 m, 06 x 1997, *MÜ* 2028. Hk.

*D. orientalis* Adams

Yumaklı valley, south slopes, 2200 m, 19 x 1997, *MÜ* 2245. Hk.

*D. erythrocoleus* Boiss.

Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1842. Hk. En.-LC. Ir.-Tur.

*D. masmenaeus* Boiss. var. *glabrescens* Boiss.

Between Adaklı village and Sultan Lake, steppe, 1800-2500 m, 11 vii 1997, *MÜ* 1582. Hk.

*D. calocephalus* Boiss.

Around Adaklı village, stream sides, 2300 m, 22 vii 1998, *MÜ* 4590. Hk.

*Petrorhagia alpina* (Hablitz) Ball & Heywood subsp. *alpina*

Between Beşparmak and Çakmak villages, meadow, 2600 m, 02 vii 1998, *MÜ* 4291. T.

*P. alpina* (Hablitz) Ball & Heywood subsp. *olympica* (Boiss.) Ball & Heywood

Between Adaklı village and Sultan Lake, meadow, 1800-2500 m, 11 vii 1997, *MÜ* 1507. T.

*Saponaria orientalis* L.

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 2967. T.

*Gypsophila bitlisensis* W.F.Barker

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 3027. T. En.-LC. Ir.-Tur.

*Vaccaria pyramidata* Medik. var. *grandiflora* (Fisch. ex DC.) Cullen

Köseveli Hill, fields, 2300 m, 17 vii 1997, *MÜ* 1699. T.

▲*V. pyramidata* Medik. var. *oxyodonta* (Boiss.) Zohary

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3531. T. Ir.-Tur.

*Silene italica* (L.) Pers.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3512. Hk.

*S. longipetala* Vent.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3605. Hk.

*S. marschallii* C.A.Mey.

Around Adaklı village, meadow, 2400 m, 06 vi 1998, *MÜ* 2635. Hk. Ir.-Tur.

*S. saxatilis* Sims

Muradiye Castle, steppe, 1820 m, 29 vi 1997, *MÜ* 1995. Hk.

*S. capitellata* Boiss.

Between Topuzarpa and Uluşar villages, meadow, 1750 m, 24 v 1997, *MÜ* 1214. Hk. En.-LC. Ir.-Tur.

*S. laxa* Boiss. & Kotschy

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 4007. Hk. Ir.-Tur.

*S. chlorifolia* Sm.

Between Beşparmak village and Köseveli Hill, meadow, 2400 m, 17 vii 1997, *MÜ* 1818. Hk. Ir.-Tur.

*S. sclerophylla* Chowdhuri

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3963. Hk. En.-LC. Ir.-Tur.

*S. cartilaginea* Hub.-Mor.

Between Beşparmak and Çakmak villages, steppe, 2600 m, 02 vii 1998, *MÜ* 4262. Hk. En.-LC. Ir.-Tur.

*S. viscosa* (L.) Pers.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3215. Hk.

*S. cappadocica* Boiss. & Heldr.

Between Adaklı village and Adaklı high-plateau, steppe, 2400 m, 06 vi 1998, *MÜ* 2641. Hk. Ir.-Tur.

*S. spergulifolia* (Desf.) M.Bieb.

Around Topuzarpa village, steppe, 1740-1900 m, 24 v 1997, *MÜ* 1171. Hk. Ir.-Tur.

*S. montbretiana* Boiss.

Pirreşit Mountain, south-west slopes, steppe, 2200 m, 11 vii 1998, *MÜ* 4417. Hk. Ir.-Tur.

*S. arguta* Fenzl

Around Adaklı village, steppe, 2400 m, 06 vi 1998, *MÜ* 2533. Hk. Ir.-Tur.

*S. ampullata* Boiss.

Between Adaklı village and Adaklı high-plateau, steppe, 2650 m, 06 vi 1998, *MÜ* 2499. Hk. Ir.-Tur.

*S. vulgaris* (Moench) Garcke var. *vulgaris*

Between Beşparmak village and Köseveli Hill, meadow, 2400 m, 17 vii 1997, *MÜ* 1859. Hk.

*S. araratica* Schischk. subsp. *davisii* (Chowdhuri) Ghaz.

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 2957. Hk. En.-NT. Ir.-Tur.

*S. alba* (Mill.) K.Krause subsp. *divaricata* (Reichb.) Walters

Around Beşparmak village, meadow, 2400 m, 11 vii 1997, *MÜ* 1640. Hk.

*S. alba* (Mill.) K.Krause subsp. *ericalycina* (Boiss.) Walters

Pirreşit Mountain, south slopes, steppe, 2400 m, 08 vi 1997, *MÜ* 1412b. Hk.

*S. dichotoma* Ehrh. subsp. *dichotoma*

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 2914. Hk.

*S. conica* L.

Muradiye Waterfall, fields, 1800 m, 29 vi 1997, *MÜ* 1485. T.

*S. subconica* Friv.

Around Adaklı village, fields, 2400 m, 10 v 1998, *MÜ* 2375. Hk.

*S. conoidea* L.

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 2903. T.

ILLEBRACEAE

*Herniaria argaea* Boiss.

Between Beşparmak and Çakmak villages, steppe, 2600 m, 02 vii 1998, *MÜ* 4281. Hk. En.-VU.

*H. incana* Lam.

Around Adaklı village, steppe, 2400 m, 06 vi 1998, *MÜ* 2853. T.

*Scleranthus annuus* L. subsp. *annuus*

Between Beşparmak and Çakmak villages, steppe, 2600 m, 02 vii 1998, *MÜ* 4311. T.

*S. uncinatus* Schur

Pirreşit Mountain, south-west slopes, steppe, 2200 m, 11 vii 1998, *MÜ* 4511. T.

POLYGONACEAE

*Rheum ribes* L.

Around Beşparmak village, rocky slopes, 2300-2450 m, 17 vii 1997, *MÜ* 1901. Kr. Ir.-Tur.

*Polygonum bistorta* L. subsp. *carneum* (Koch) Coode & Cullen

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3986. Hk. Eux. (mt.).

*P. amphibium* L.

Between Muradiye town and Yumaklı village, damp places, 1716 m, 06 x 1997, *MÜ* 2030. Hk.

*P. salicifolium* Brouss. ex Willd.

Between Adaklı village and Sultan Lake, in water, 1800-2500 m, 11 vii 1997, *MÜ* 1621. Hk.

*P. setosum* Jacq.

Yumaklı valley, south slopes, 2200 m, 19 x 1997, *MÜ* 2205. Hk. Ir.-Tur.

*P. cognatum* Meisn.

Between Topuzarpa and Uluşar villages, meadow, 1750 m, 24 v 1997, *MÜ* 1216b. Hk.

**P. arenastrum** Bor

Between Yakıncak and Yumaklı villages, field edges, 1800 m, 06 x 1997, *MÜ* 2046. T.

**P. aviculare** L.

Muradiye Waterfall, stream side, 1800 m, 18 x 1997, *MÜ* 2126. T.

**Rumex acetosella** L.

Pirreşit Mountain, south slopes, meadow, 2400 m, 08 vi 1997, *MÜ* 1244. Hk.

**R. scutatus** L.

Yumaklı valley, south slopes, steppe, 2200 m, 19 x 1997, *MÜ* 2234. Kh.

**R. tuberosus** L. subsp. *horizontalis* (Koch) Rech.

Muradiye Waterfall, stream side, 1726-1800 m, 17 v 1997, *MÜ* 1140. Kr.

**R. caucasicus** Rech.

Between Beşparmak village and Köseveli Hill, meadow, 2400 m, 17 vii 1997, *MÜ* 1723. Hk. Eux. (mt.).

**R. ponticus** E.H.L.Krause

Pirreşit Mountain, south-west slopes, steppe, 2200 m, 11 vii 1998, *MÜ* 4491. Hk. En.-LC. Ir.-Tur.

**R. crispus** L.

Between Muradiye town and Yakıncak village, meadows, 1800 m, 06 x 1997, *MÜ* 2025. Hk.

**CHENOPODIACEAE****Chenopodium botrys** L.

Between Muradiye town and Yakıncak village, field edges, 1800 m, 06 x 1997, *MÜ* 2072. T.

**C. foliosum** (Moench) Asch.

Around Beşparmak village, steppe, 2300-2450 m, 17 vii 1997, *MÜ* 1631. Hk.

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

Between Topuzarpa and Kocasapan villages, roadside, 1800 m, 26 x 1997, *MÜ* 2306. T.

**C. album** L. subsp. *album* var. *microphyllum* (Boenn.) Aellen

Between Muradiye town and Yakıncak village, field edges, 1800 m, 06 x 1997, *MÜ* 2010. T.

**Atriplex tatarica** L. var. *tatarica*

Between Yakıncak and Yumaklı villages, field edges, 1800 m, 06 x 1997, *MÜ* 2048. T.

**Kochia prostrata** (L.) Schrad.

Pirreşit Mountain, stony steppe, 2900 m, 08 vi 1997, *MÜ* 1956. Kh.

**Salsola ruthenica** Iljin

Between Muradiye town and Yakıncak village, field edges, 1800 m, 06 x 1997, *MÜ* 2073. Hk.

**Noaea mucronata** (Forssk.) Asch. & Schweinf. subsp. *mucronata*

Between Topuzarpa and Kocasapan villages, roadside, 1800 m, 26 x 1997, *MÜ* 2294. Kh.

**AMARANTHACEAE****Amaranthus chlorostachys** Willd.

Between Topuzarpa and Kocasapan villages, roadside, 1800 m, 26 x 1997, *MÜ* 2282. T.

**HYPERICACEAE (GUTTIFERAE)**

**Hypericum elongatum** Ledeb subsp. *apiculatum* Robson

Between Beşparmak village and Köseveli Hill, meadow, 2400 m, 17 vii 1997, *MÜ* 1708. Hk. Ir.-Tur.

**H. thymbrifolium** Boiss. & Noë

Pirreşit Mountain, south slopes, meadow, 2400 m, 08 vi 1997, *MÜ* 1246. Hk. En.-LC. Ir.-Tur.

**H. scabrum** L.

Around Beşparmak village, steppe, 2300-2450 m, 17 vii 1997, *MÜ* 1908. Kh. Ir.-Tur.

**H. venustum** Fenzl

Between Beşparmak and Çakmak villages, meadow, 2600 m, 02 vii 1998, *MÜ* 4344. Hk.

**H. linarioides** Bosse

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3696. Hk.

**H. armenum** Jaub. & Spach

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3912. Hk. Ir.-Tur.

**H. perforatum** L.

Around Adaklı village, stream sides, 2300 m, 22 vii 1998, *MÜ* 4564. Hk.

**MALVACEAE****Malva neglecta** Wallr.

Between Beşparmak and Adaklı villages, meadow, 2600 m, 02 vii 1998, *MÜ* 4234. T.

**Alcea setosa** (Boiss.) Alef.

Between Yakıncak and Yumaklı villages, field edges, 1800 m, 06 x 1997, *MÜ* 2051. Hk. E.Medit.

**A. calvertii** (Boiss.) Boiss.

Around Muradiye Dam, roadside, 1800 m, 28 vi 1997, *MÜ* 1452. Hk. En.-LC. Ir.-Tur.

**LINACEAE**

**Linum mucronatum** Bertol. subsp. *armenum* (Bordz.) P.H.Davis

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3215. Kh. Ir.-Tur.

**L. austriacum** L. subsp. *austriacum*

Between Muradiye town and Yumaklı village, steppe, 1716 m, 06 x 1998, *MÜ* 3154. Hk.

**L. austriacum** L. subsp. *glaucescens* (Boiss.) P.H.Davis

Between Adaklı village and Adaklı high-plateau, meadow, 2400 m, 06 vi 1998, *MÜ* 2655. Hk.

**GERANIACEAE**

**Geranium tuberosum** L. subsp. *tuberosum*

Between Adaklı village and Adaklı high-plateau, steppe, 2400 m, 06 vi 1998, *MÜ* 2690. Kr.

**G. stepporum** P.H.Davis

Around Topuzarpa village, steppe, 1740-1900 m, 24 v 1997, *MÜ* 1211. Kr. Ir.-Tur.

**Erodium absinthoides** Willd. subsp. *absinthoides*

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 2953. Hk. En.-LC. Ir.-Tur.

*E. absinthoides* Willd. subsp. *armenum* (Trautv.) P.H.Davis

Muradiye Waterfall, stream side, 1726-1800 m, 17 v 1997, *MÜ* 1146. Hk. Ir.-Tur.

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

Yumaklı valley, south slopes, steppe, 1830 m, 11 v 1997, *MÜ* 1083. T.

#### ZYGOPHYLLACEAE

*Peganum harmala* L.

Muradiye Castle, steppe, 1820 m, 29 vi 1997, *MÜ* 1982. Hk.

#### ACERACEAE

*Acer negundo* L.

Around Muradiye Dam, roadside, 1800 m, 29 vi 1997, *MÜ* 1454. Fh.

#### FABACEAE (LEGUMINOSAE)

\**Robinia pseudoacacia* L.

Around Fatih district, roadside, 1716 m, 07 vi 1997, *MÜ* 1276. Fh.

*Astragalus mollis* M.Bieb.

Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1812. Hk. Ir.-Tur.

*A. comosoides* D.F.Chamb. & Matthews

Between Topuzarpa and Uluşar villages, meadow, 1750 m, 24 v 1997, *MÜ* 1227. Hk. En.-LC. Ir.-Tur.

*A. galegiformis* L.

Between Adaklı village and Sultan Lake, meadow, 1800-2500 m, 11 vii 1997, *Behçet* 5719. Hk. Euro-Sib.

*A. angustiflorus* Koch subsp. *angustiflorus*

Around Topuzarpa village, meadow, 1740-1900 m, 24 v 1997, *MÜ* 1184. Hk. Ir.-Tur.

*A. declinatus* Willd.

Around Topuzarpa village, steppe, 1740-1900 m, 24 v 1997, *MÜ* 1200. Kh. Ir.-Tur.

*A. gummifer* L.

Around Yumaklı village, field edges, 1750 m, 06 x 1997, *MÜ* 2083. Kh. Ir.-Tur.

*A. caspicus* M.Bieb.

Between Beşparmak village and Köseveli Hill, steppe, 2400 m, 17 vii 1997, *MÜ* 1870. Hk. Ir.-Tur.

*A. aureus* Willd.

Between Beşparmak village and Köseveli Hill, steppe, 2400 m, 17 vii 1997, *MÜ* 1865. Hk. Ir.-Tur.

*A. pycnocephalus* Fisch. var. *pycnocephalus*

Between Adaklı village and Sultan Lake, steppe, 1800-2500 m, 11 vii 1997, *MÜ* 1560. Hk. Ir.-Tur.

*A. amblolepis* Fisch.

Around Yumaklı village, field edges, 1750 m, 06 x 1997, *MÜ* 2004. Hk. Ir.-Tur.

*A. lagurus* Willd.

Around Beşparmak village, steppe, 2300-2450 m, 17 vii 1997, *MÜ* 1620. Kh. Ir.-Tur.

*A. lagopodioides* Vahl

Pirreşit Mountain, near summit, alpine steppe, 3000 m, 30 vi 1998, *MÜ* 3083. Hk. Ir.-Tur.

*A. sosnowskyi* Grossh.

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 2898. Kh.

▲*A. dictyophysus* Reut. ex Bunge

Pirreşit Mountain, south slopes, steppe, 2400 m, 08 vi 1997, *MÜ* 1360. Hk. Ir.-Tur.

Firstly collected in B squares.

▲*A. mesites* Boiss. & Buhse

Between Adaklı village and Sultan Lake, steppe, 2500 m, 28 vi 1998, *MÜ* 4185. Hk. Ir.-Tur.

*A. echinops* Aucher ex Boiss.

Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1905. Hk.

*A. lineatus* Lam. var. *lineatus*

Between Muradiye town and Yumaklı village, steppe, 1716 m, 06 x 1998, *MÜ* 3904. Kh.

*A. odoratus* Lam.

Pirreşit Mountain, near summit, alpine steppe, 3000 m, 27 vi 1997, *MÜ* 1953. Hk.

*A. fumosus* Boriss.

Muradiye Waterfall, stream side, 1726-1800 m, 17 v 1997, *MÜ* 1147. Hk. Ir.-Tur.

*A. xylobasis* Freyn & Bornm. var. *angustus* (Freyn & Sint.) Freyn & Bornm.

Around Muradiye Waterfall, fields, 1800 m, 29 vi 1997, *MÜ* 1459. Kh. En.-LC. Ir.-Tur.

*A. onobrychioides* M.Bieb.

Around Beşparmak village, steppe, 2300-2450 m, 17 vii 1997, *MÜ* 1892. Hk.

*A. arguricus* Bunge

Between Adaklı village and Sultan Lake, steppe, 1800-2500 m, 11 vii 1997, *MÜ* 1572. Hk. VU. Ir.-Tur.

*A. bicolor* Lam.

Between Beşparmak village and Köseveli Hill, steppe, 2400 m, 17 vii 1997, *MÜ* 1787. Hk. Ir.-Tur.

*A. fragrans* Willd.

Between Yakıncak and Yumaklı villages, steppe, 1800 m, 11 v 1997, *MÜ* 1102. Kh. Ir.-Tur.

*A. humilis* M.Bieb.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3491. Hk. Ir.-Tur.

▲*A. fodinarum* Boiss. & Noé.

Between Adaklı village and Sultan Lake, meadow, 1800-2500 m, 11 vii 1997, *MÜ* 4328. Hk. Ir.-Tur.

*A. campylosema* Boiss. subsp. *campylosema*

Around Topuzarpa village, steppe, 1740-1900 m, 24 v 1997, *MÜ* 1182. Kh. En.-LC. Ir.-Tur.

*A. campylosema* Boiss. subsp. *nigripilis* Hub.-Mor. & D.F.Chamb.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3471. Kh. En.-LC. Ir.-Tur.

*Cicer anatolicum* Alef.

Around Muradiye Waterfall, steppe, 1726-1800 m, 17 v 1997, *MÜ* 1114. Hk. Ir.-Tur.

*Vicia cracca* L. subsp. *cracca*

Köseveli Hill, north slopes, steppe, 2300 m, 17 vii 1997, *MÜ* 1697. Hk. Euro-Sib.

*V. cracca* L. subsp. *tenuifolia* (Roth) Gaudin

Pirreşit Mountain, south-west slopes, steppe, 2200 m, 11 vii 1998, *MÜ* 4503. Hk.

*V. cracca* L. subsp. *stenophylla* Vell.

Pirreşit Mountain, north-west slopes, steppe, 2200-2600 m, 11 vii 1998, *MÜ* 1584. Hk.

*V. alpestris* Steven subsp. *alpestris*

Between Beşparmak and Çakmak villages, alpine meadows, 2600 m, 02 vii 1998, *MÜ* 4355. Hk.

*V. villosa* Roth subsp. *villosa*

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3589. Hk.

*V. cappadocica* Boiss. & Ball

Muradiye Dam district, meadow, 1726-1740 m, 17 v 1997, *MÜ* 1113. Hk.

*V. sativa* L. subsp. *nigra* (L.) Ehrh. var. *nigra*

Pirreşit Mountain, field, 2400 m, 08 vi 1997, *MÜ* 1342. T.

*V. sativa* L. subsp. *incisa* (M.Bieb.) Archer var. *cordata* (Wulfen ex Hoppe) Archer

Around Muradiye Waterfall, stream side, 1726-1800 m, 17 v 1997, *MÜ* 1111. T.

*Lathyrus brachypterus* Čelak. var. *haussknechtii* (Širj.) P.H.Davis

Around Adaklı village, meadow, 2400 m, 06 vi 1998, *MÜ* 2622. Hk. En.-LC. Ir.-Tur.

*L. nivalis* Hand.-Mazz.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3603. Hk. En.-LC. Ir.-Tur.

*L. cyaneus* (Steven) Koch var. *pinnatus* P.H.Davis

Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1637. Hk. En.-NT. H. Eux.

*L. pratensis* L.

Between Beşparmak and Çakmak villages, meadow, 2600 m, 02 vii 1998, *MÜ* 4242. Hk. Euro-Sib.

*L. rotundifolius* Willd. subsp. *miniatus* (M.Bieb. ex Steven) P.H.Davis

Pirreşit Mountain, near summit, alpine steppe, 3000 m, 27 vi 1997, *MÜ* 1954. Hk.

▲*L. vinealis* Boiss. & Noé.

Around Karaoğlan district, meadow, 1800 m, 07 vi 1997, *MÜ* 1347. T. Ir.-Tur.

*L. cicera* L.

Around Yakıncak district, meadow, 1800 m, 07 vi 1997, *MÜ* 1301. T.

*Ononis arvensis* L.

Around Fatih district, meadow, 1716 m, 06 x 1997, *MÜ* 2075. Kh. Euro-Sib.

*Trifolium repens* L. var. *repens*

Pirreşit Mountain, south slopes, steppe, 2400 m, 08 vi 1997, *MÜ* 1247. Kh.

*T. montanum* L. subsp. *humboldtianum* (A.Br. & Asch.) M.Hossain

Between Adaklı village and Sultan Lake, meadow, 2500 m, 28 vi 1998, *MÜ* 4095. Hk.

*T. ambiguum* M.Bieb.

Around Karaoğlan district, meadow, 1800 m, 17 vii 1997, *MÜ* 1899. Hk.

*T. hybridum* L. var. *hybridum*

Between Adaklı village and Sultan Lake, meadow, 1800-2500 m, 11 vii 1997, *MÜ* 1567. Hk.

*T. rytidosemium* Boiss. & Hoh. var. *rytidosemium*

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 4056. Hk. H.Eux. (mt.).

*T. spadiceum* L.

Around Adaklı village, stream side, 2300 m, 17 vii 1998, *MÜ* 4527. T. Euro-Sib.

▲*T. aureum* Pollich

Between Adaklı village and Sultan Lake, meadow, 1800-2500 m, 11 vii 1997, *MÜ* 1586. T. Euro-Sib.

*T. clusii* Godr. & Gren.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3563. T.

*T. pratense* L. var. *pratense*

Between Muradiye town and Yakıncak village, meadow, 1800 m, 06 x 1997, *MÜ* 2035. Hk.

*T. trichocephalum* M.Bieb.

Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1626. Hk.

*Melilotus officinalis* (L.) Desr.

Pirreşit Mountain, steppe, 3000 m, 27 vi 1997, *MÜ* 1931. Hk.

*M. alba* Desr.

Muradiye Waterfall, stream side, 1800 m, 18 x 1997, *MÜ* 2108. Hk.

*Trigonella arcuata* C.A.Meyer

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30.06.1998, *MÜ* 3295. T.

*T. monantha* C.A.Meyer subsp. *monantha*

Between Yakıncak and Yumaklı villages, steppe, 1800 m, 11 v 1997, *MÜ* 1099a. T. Ir.-Tur.

*T. monantha* C.A.Meyer subsp. *noeana* (Boiss.) Hub.-Mor.

Pirreşit Mountain, near summit, alpine steppe, 3000 m, 30 vi 1998, *MÜ* 3087. T. Ir.-Tur.

*Medicago sativa* L. subsp. *sativa*

Between Muradiye town and Yakıncak village, field edges, 1800 m, 06 x 1997, *MÜ* 2029. Hk.

*M. sativa* L. subsp. *coerulea* (Less. ex Ledeb.)

Around Adaklı village, steppe, 2400 m, 22 vii 1998, *MÜ* 4528. Hk.

*M. x varia* Martyn

Pirreşit Mountain, south-west slopes, steppe, 2200 m, 11 vii 1998, *MÜ* 4437. Hk.

*Lotus corniculatus* L. var. *corniculatus*

Between Muradiye town and Yakıncak village, meadow, 1800 m, 06 x 1997, *MÜ* 2021. Hk.

*Coronilla orientalis* Mill. var. *orientalis*

Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1894. Hk.

*C. varia* L. subsp. *varia*

Pirreşit Mountain, near summit, alpine steppe, 3000 m, 27 vi 1997, *MÜ* 1950. Hk.

*Hedysarum hedysaroides* (L.) Schinz & Thell.

Pirreşit Mountain, near summit, alpine steppe, 3000 m, 27 vi 1997, *MÜ* 1928. Hk.

▲*H. elegans* Boiss. & É.Huet

Pirreşit Mountain, near summit, alpine steppe, 3000 m, 30 vi 1998, *MÜ* 3079. Hk. Ir.-Tur.



*Onobrychis cornuta* (L.) Desv.

Around Topuzarpa village, stony steppe, 1740-1900 m, 24 v 1997, *MÜ* 1181. Kh. Ir.-Tur.

*O. fallax* Freyn & Sint.

Between Beşparmak village and Köseveli Hill, meadow, 2400 m, 17 vii 1997, *MÜ* 1778, Hk. En.-LC.

▲*O. sulphurea* Boiss. & Ball var. *sulphurea*

Around Adaklı village, meadow, 2400 m, 06 vi 1998, *MÜ* 2495. Hk. En.-VU.

▲*O. armena* Boiss. & É.Huet

Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1667. Hk. En.-LC.

ROSACEAE

*Cerasus microcarpa* (C.A.Meyer) Boiss. subsp. *tortuosa* (Boiss. & Hausskn.) Browicz

Between Adaklı village and Adaklı high plateau, steppe, 2400 m, 19 v 1998, *MÜ* 2466. Fh. Ir.-Tur.

*Amygdalus communis* L.

Around Yumaklı valley, south slopes, 2200 m, 19 x 1997, *MÜ* 2267. Fh.

*Filipendula ulmaria* (L.) Maxim.

Between Beşparmak and Çakmak villages, meadow, 2600 m, 02 vii 1998, *MÜ* 4390. Kr. Euro-Sib.

*Potentilla bifurca* L.

Between Topuzarpa and Uluşar villages, meadow, 1750 m, 24 v 1997, *MÜ* 1226. Hk.

*P. argentea* L.

Around Adaklı village, steppe, 2400 m, 22 vii 1998, *MÜ* 4580. Hk.

*P. inclinata* Vill.

Between Adaklı village and Sultan Lake, meadow, 1800-2500 m, 11 vii 1997, *MÜ* 1564. Hk.

*P. recta* L.

Between Beşparmak village and Köseveli Hill, meadow, 2400 m, 17 vii 1997, *MÜ* 1443. Hk.

*P. supina* L.

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 2965. T.

*P. argaea* Boiss. & Ball

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3779. Hk. Ir.-Tur.

*P. anatolica* Peşmen

Between Adaklı village Sultan Lake, meadow, 2500 m, 11 vii 1998, *Behçet* 5727. Kr. En.-LC. Ir.-Tur.

*P. pannosa* Boiss. & Hausskn.

Between Beşparmak and Çakmak villages, steppe, 2600 m, 02 vii 1998, *MÜ* 4370. Hk. VU. Ir.-Tur.

*P. aucheriana* Thell.

Between Beşparmak village and Köseveli Hill, meadow, 2400 m, 17 vii 1997, *MÜ* 1853. Hk. Ir.-Tur.

*P. reptans* L.

Between Muradiye town and Yakıncak village, stream side, 1800 m, 06 x 1997, *MÜ* 2039. Hk.

*Geum rivale* L.

Between Adaklı village and Sultan Lake, meadow, 2500 m, 28 vi 1998, *MÜ* 4090. Kr.

*Sanguisorba minor* Scop. subsp. *muricata* (Spach) Briq.

Muradiye Waterfall, fields, 1800 m, 29 vi 1997, *MÜ* 1457. Hk.

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

Around Yakıncak valley, south slopes, steppe, 1800 m, 07 vi 1997, *MÜ* 1303. Hk.

*Alchemilla erythropoda* Juz.

Between Adaklı village and Sultan Lake, meadow, 2550 m, 11.05.1997, *Behçet* 5694. Hk. Euro-Sib.

*A. valdehirsuta* Buser

Between Beşparmak and Çakmak villages, meadow, 2600 m, 02 vii 1998, *MÜ* 4367. Hk.

*A. crinita* Buser

Pirreşit Mountain, south-west slopes, stream side, 2000 m, 28 vi 1998, *MÜ* 4058. Hk.

*A. compactilis* Juz.

Between Beşparmak and Çakmak villages, meadow, 2600 m, 02 vii 1998, *MÜ* 4347. Hk.

*A. persica* Rothm.

Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1903. Hk.

*Rosa pimpinellifolia* L.

Between Muradiye town and Yumaklı village, steppe, 1716 m, 06 x 1998, *MÜ* 3954. Fh. Euro-Sib.

*R. pulverulenta* M.Bieb.

Around Yakıncak valley, south slopes, steppe, 1800 m, 07 vi 1997, *MÜ* 1295. Fh.

*R. montana* Chaix subsp. *woronowii* (Lonacz.) O.Nilsson

Between Adaklı village and Sultan Lake, steppe, 1800-2500 m, 11 vii 1997, *MÜ* 1594. Fh.

*R. canina* L.

Around Yumaklı valley, south slopes, steppe, 2200 m, 19 x 1997, *MÜ* 2249. Fh.

*Cotoneaster nummularia* Fisch. & C.A.Mey.

Around Yumaklı valley, south slopes, steppe, 2200 m, 19 x 1997, *MÜ* 2172. Kh.

\**Malus sylvestris* Mill. subsp. *mitis* (Wallr.) Mansf.

Muradiye Waterfall, rocky area, 1800 m, 19 v 1998, *MÜ* 2404. Fh.

LYTHRACEAE

*Lytrum salicaria* L.

Pirreşit Mountain, stream side, 3000 m, 27 vi 1997, *MÜ* 1963. Hk. Euro-Sib.

ONAGRACEAE

*Epilobium angustifolium* L.

Between Beşparmak and Çakmak villages, meadow, 2600 m, 02 vii 1998, *MÜ* 4248. Hk.

*E. hirsutum* L.

Around Adaklı village, stream sides, 2300 m, 22 vii 1998, *MÜ* 4557. Kr.

*E. montanum* L.

Between Yakıncak and Yumaklı villages, stream side, 1800 m, 06 x 1997, *MÜ* 2052. Hk. Euro-Sib.

*E. tetragonum* L. subsp. *lamyi* (F.W.Schultz) Nyman

Pirreşit Mountain, south-west slopes, steppe, 2200 m, 11 vii 1998, *MÜ* 4409. Hk. Euro-Sib.

*E. roseum* Schreb. subsp. *subsessil* (Boiss.) P.H.Raven

Around Yumaklı Valley, south slopes, stream side, 2200 m, 19 x 1997, *MÜ* 2236. Kr.

*E. minutiflorum* Hausskn.

Pirreşit Mountain, south-west slopes, stream side, 2000 m, 30 vi 1998, *MÜ* 3894. Hk. Ir.-Tur.

*E. gemmascens* C.A.Mey.

Pirreşit Mountain, south-west slopes, meadow, 2200 m, 11 vii 1998, *MÜ* 4398. Kr.

#### CUCURBITACEAE

\**Citrullus lanatus* (Thunb.) Matsum. & Nakai

Muradiye Waterfall, stream side, 1800 m, 18 x 1997, *MÜ* 2136. T.

#### CRASSULACEAE

*Rosularia sempervivum* (M.Bieb.) A.Berger subsp. *kurdica* Eggli

Around Beşparmak village, rocky area, 2300-2450 m, 17 vii 1997, *MÜ* 1829a. Hk. Ir.-Tur.

*R. radicyflora* Boriss. subsp. *radicyflora*

Around Beşparmak village, rocky area, 2300-2450 m, 17 vii 1997, *MÜ* 1829b. Hk. Ir.-Tur.

*Sedum album* L.

Around Beşparmak village, stony area, 2300-2450 m, 17 vii 1997, *MÜ* 1874. Kh.

*S. subulatum* (C.A.Mey.) Boiss.

Around Muradiye Waterfall, steppe, 1800 m, 29 vi 1997, *MÜ* 1493. Hk.

*S. gracile* C.A.Mey.

Between Adaklı village and Sultan Lake, meadow, 1800-2500 m, 11 vii 1997, *Behçet* 5732. Hk. H.Eux. (mt).

▲*Sempervivum armenum* Boiss. & É.Huet var. *armenum*

Pirreşit Mountain, south-west slopes, rocky area, 2200 m, 11 vii 1998, *MÜ* 4512. Hk. En.-LC. Eux. (mt).

#### APIACEAE (UMBELLIFERAE)

*Eryngium billardieri* Delar.

Araound Yumaklı village, field edges, 1750 m, 06 x 1997, *MÜ* 2080. Hk. Ir.-Tur.

*Chaerophyllum bulbosum* L.

Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1903. Kr. Euro-Sib.

*C. crinitum* Boiss.

Between Beşparmak village and Köseveli Hill, steppe, 2400 m, 17 vii 1997, *MÜ* 1776. Kr. Ir.-Tur.

*Grammosciadium daucoides* DC.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3827. Hk. Ir.-Tur.

*G. platycarpum* Boiss. & Hausskn.

Around Yakıncak Valley, south slopes, steppe, 1800 m, 07 vi 1997, *MÜ* 1305. Hk. Ir.-Tur.

*G. pterocarpum* Boiss.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3432. Hk. Ir.-Tur.

*Antriscus nemorosa* (M.Bieb.) Spreng.

Muradiye Waterfall, stream side, 1726-1800 m, 17 v 1997, *MÜ* 1120. Kr.

*Scandix stellata* Banks & Sol.

Around Adaklı village, field, 2400 m, 06 vi 1998, *MÜ* 2860. T.

*S. iberica* M.Bieb.

Between Topuzarpa and Uluşar villages, field, 1750 m, 24 v 1997, *MÜ* 1220. T.

*Fuernrohria setifolia* C.Koch

Between Beşparmak and Çakmak villages, meadow, 2600 m, 02 vii 1998, *MÜ* 4340. Hk.

*Bunium paucifolium* DC. var. *paucifolium*

Between Adaklı village and Sultan Lake, steppe, 1800-2500 m, 11. vii 1997, *MÜ* 1502. Kr. Ir.-Tur.

*B. microcarpum* (Boiss.) Freyn subsp. *buogaiei* (Boiss.) Hedge & Lamond

Around Yumaklı valley, south slopes, steppe, 2200 m, 19 x 1997, *MÜ* 2189. Kr. Ir.-Tur.

*Pimpinella corymbosa* Boiss.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3949. Hk. Ir.-Tur.

*P. rhodantha* Boiss.

Between Beşparmak village and Köseveli Hill, meadow, 2400 m, 17 vii 1997, *MÜ* 1766. Hk.

*P. anthriscoides* Boiss. var. *anthriscoides*

Between Adaklı village and Sultan Lake, steppe, 1800-2500 m, 11 vii 1997, *MÜ* 3873. Hk. Ir.-Tur.

*P. peucedanifolia* Fisch. ex Ledeb.

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 2981. Hk. Ir.-Tur.

*Prangos uloptera* DC.

Between Adaklı village and Sultan Lake, meadow, 1800-2500 m, 11 vii 1997, *MÜ* 1970. Hk. Ir.-Tur.

*P. ferulacea* (L.) Lindl.

Between Adaklı village and Sultan Lake, steppe, 1800-2500 m, 11 vii 1997, *MÜ* 1503. Hk.

*Bupleurum rotundifolium* L.

Around Muradiye Waterfall, fields, 1800 m, 29 vi 1997, *MÜ* 1477. T.

*Falcaria vulgaris* Bernh.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3305. Hk.

*Xanthogalum purpurascens* Lallemand.

Around Adaklı village, stream side, 2400 m, 22 vii 1998, *MÜ* 4530. Hk.

*Ferula haussknechtii* Wolff ex Rech.f.

Between Beşparmak and Çakmak villages, steppe, 2600 m, 02 vii 1998, *MÜ* 4240. Hk. Ir.-Tur.

*Ferulago angulata* (Schltdl.) Boiss.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3267. Hk. VU. Ir.-Tur.

*Malabaila dasyantha* (C.Koch) Grossh.

Around Yakıncak valley, south slopes, steppe, 1800 m, 07 vi 1997, *MÜ* 1296. Hk. Ir.-Tur.

*Heracleum crenatifolium* Boiss.

Pirreşit Mountain, south slopes, alpine steppe, 3000 m, 17 vii 1997, *MÜ* 1914. Hk. En.-NT.

*Torilis leptocarpa* (Hochst.) C.C.Towns.

Around Karaoğlan district, field, 1800 m, 07 vi 1997, *MÜ* 1241. T. Ir.-Tur.

*Astrodaucus orientalis* (L.) Drude

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3245. T. Ir.-Tur.

*Turgenia latifolia* (L.) Hoffm.

Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1628. T.

*Daucus carota* L.

Between Topuzarpa and Kocasapan villages, roadside, 1800 m, 26 x 1997, *MÜ* 2284. Hk.

VALERIANACEAE

*Valeriana alliariifolia* Adams

Between Adaklı village and Sultan Lake, meadow, 1800-2500 m, 11 vii 1997, *MÜ* 1549. Hk.

*V. sisymbriifolia* Vahl

Between Adaklı village and Adaklı high-plateau, steppe, 2400 m, 19 v 1998, *MÜ* 2460. Kr. Ir.-Tur.

*V. leucophaea* DC.

Adaklı village and Adaklı high-plateau, meadow, 2400 m, 06 vi 1998, *MÜ* 2715. Kr. H.Eux. (mt.).

*Valerianella tuberculata* Boiss.

Pirreşit Mountain, near summit, alpine steppe, 3000 m, 30 vi 1998, *MÜ* 3088. T. Ir.-Tur.

*V. oxyrhyncha* Fisch. & C.A.Mey.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3425. T. Ir.-Tur.

*V. cymbicarpa* C.A.Mey.

Around Adaklı village, steppe, 2400 m, 10 v 1998, *MÜ* 2384. T. Ir.-Tur.

DIPSACACEAE

*Cephalaria procera* Fisch. & Lall.

Köseveli Mountain, north slopes, steppe, 2300 m, 17 vii 1997, *MÜ* 1700. Hk. Ir.-Tur.

*C. sparsipilosa* Matthews

Around Beşparmak village, steppe, 2300-2450 m, 17 vii 1997, *MÜ* 1885. Hk. En.-NT. Ir.-Tur.

*Scabiosa argentea* L.

Between Muradiye town and Yakıncak village, field edges, 1800 m, 06 x 1997, *MÜ* 2031. Hk.

*S. micrantha* Desf.

Around Muradiye Waterfall, fields, 1800 m, 29 vi 1997, *MÜ* 1480. T.

*S. calocephala* Boiss.

Pirreşit Mountain, near summit, alpine steppe, 2900 m, 08 vi 1997, *MÜ* 1692. T. Ir.-Tur.

ASTERACEAE (COMPOSITAE)

*Bidens tiripartita* L.

Between Muradiye town and Yakıncak village, stream side, 1800 m, 06 x 1997, *MÜ* 2038. T.

*Xanthium spinosum* L.

Around Yumaklı village, humid areas, 1800 m, 06 x 1997, *MÜ* 2080. T.

*Inula helenium* L. subsp. *pseudohelenium* Grierson

Around Yumaklı valley, humid areas, 2200 m, 19 x 1997, *MÜ* 2200. Kr. Ir.-Tur.

*I. acaulis* Schott & Kotschy ex Boiss. var. *caulescens* Nábělek

Between Beşparmak and Çakmak villages, meadow, 2600 m, 02 vii 1998, *MÜ* 4263. Kr.

*I. oculus-christi* L.

Between Topuzarpa and Kocasapan villages, roadside, 1800 m, 26 x 1997, *MÜ* 2307. Kr. Euro-Sib.

*Pulicaria vulgaris* (L.) Gaertner

Between Topuzarpa and Kocasapan villages, stream side, 1800 m, 26 x 1997, *MÜ* 2308. T. Euro-Sib.

*Helichrysum graveolens* (M.Bieb.) Sweet

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3335. Hk.

*H. plicatum* DC. subsp. *plicatum*

Around Beşparmak village, steppe, 2300-2450 m, 17 vii 1997, *MÜ* 1888. Hk.

*H. armenium* DC. subsp. *armenium*

Around Beşparmak village, steppe, 2300-2450 m, 17 vii 1997, *MÜ* 1904. Kh. Ir.-Tur.

*H. arenarium* (L.) Moench subsp. *rubicundum* (C.Koch.) P.H.Davis & Kupicha

Around Beşparmak village, steppe, 2300-2450 m, 17 vii 1997, *MÜ* 1665. Hk. Ir.-Tur.

*Logfia arvensis* (L.) Holub

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3631. T.

*Evax anatolica* Boiss. & Heldr.

Between Beşparmak and Çakmak villages, alpine steppe, 2600 m, 02 vii 1998, *MÜ* 4312. T. Ir.-Tur.

\**Aster leavis* L.

Kandehar district, gardens, 1716 m, 06 x 1997, *MÜ* 2059. Hk.

*Erigeron caucasicus* Stev. subsp. *venustus* (Botsch.) Grierson

Around Muradiye Castle, alpine steppe, 1820 m, 29 vi 1997, *MÜ* 1998. Hk.

*E. acer* L. subsp. *acer*

Pirreşit Mountain, north-west slopes, steppe, 2200-2600 m, 11 vii 1998, *MÜ* 4397. Hk.

*E. acer* L. subsp. *pycnotrichus* (Vierh.) Grierson

Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1692. Hk. Euro-Sib.

▲*Doronicum macrophyllum* Fisch. ex Hornem.

Between Adaklı village and Adaklı high plateau, meadow, 2400 m, 06 vi 1998, *MÜ* 2558. Hk. VU. Eux.

*Senecio pseudo-orientalis* Schischk.

Around Beşparmak village, steppe, 2300-2450 m, 17 vii 1997, *MÜ* 1821. Hk. Ir.-Tur.

*S. othonnae* M.Bieb.

Between Beşparmak village and Köseveli Hill, meadow, 2400 m, 17 vii 1997, *MÜ* 1794. Hk. Euro-Sib.

*S. vernalis* Waldst. & Kit Tan

Kandehar district, fields, 1800 m, 11 v 1997, *MÜ* 1101. T.

*Anthemis tinctoria* L. var. *tinctoria*

Between Beşparmak village and Köseveli Hill, steppe, 2400 m, 17 vii 1997, *MÜ* 1773. Hk.

- A. wiedemanniana** Fisch. & C.A.Mey.  
Around Yakıncak Valley, south slopes, steppe, 1800 m, 08 vi 1997, *MÜ* 1240. T. En.-LC.
- Achillea vermicularis** Trin.  
Pirreşit Mountain, south-west slopes, steppe, 2500 m, 19 x 1997, *MÜ* 2180. Hk. Ir.-Tur.
- A. tenuifolia** Lam.  
Between Muradiye town and Yakıncak village, field edges, 1800 m, 06 x 1997, *MÜ* 2020. Hk. Ir.-Tur.
- A. aleppica** DC. subsp. *aleppica*  
Muradiye Waterfall, steppe, 1800 m, 18 x 1997, *MÜ* 2090. Hk. Ir.-Tur.
- A. millefolium** L. subsp. *millefolium*  
Between Muradiye town and Yakıncak village, field edges, 1800 m, 06 x 1997, *MÜ* 2014. Hk. Euro-Sib.
- ▲ **A. millefolium** L. subsp. *pannonica* (Scheele) Hayek  
Between Beşparmak village and Köseveli Hill, meadow, 2400 m, 17 vii 1997, *MÜ* 1745. Hk. Euro-Sib.
- A. Biebersteinii** Afan.  
Between Adaklı village and Sultan Lake, steppe, 1800-2500 m, 11 vii 1997, *MÜ* 1506. Hk. Ir.-Tur.
- Tanacetum balsamita** L. subsp. *balsamitoides* (Sch.Bip.) Grierson  
Between Adaklı village and Sultan Lake, meadow, 2250 m, 11 v 1997, *MÜ* 1553. Kr.
- T. zahlbruckneri** (Nábělek) Grierson  
Between Adaklı village and Sultan Lake, meadow, 2500 m, 28 vi 1998, *MÜ* 4161. Hk. En.-LC. Ir.-Tur.
- T. kotschyi** (Boiss.) Grierson  
Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1684. Hk. Ir.-Tur.
- T. chiliophyllum** (Fisch. & C.A.Mey.) Sch.Bip. var. *chiliophyllum*  
Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1693. Kr.
- T. uniflorum** (Fisch. & C.A.Mey.) Sch.Bip.  
Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 2958. Hk. VU. Ir.-Tur.
- T. abrotanifolium** (L.) Druce  
Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1639. Hk. Ir.-Tur.
- T. argenteum** (Lam.) Willd. subsp. *canum* (C.Koch) Grierson var. *canum*  
Muradiye Waterfall, fields, 1800 m, 29 vi 1997, *MÜ* 1453. Hk.
- Tripleurospermum oreades** (Boiss.) Rech.f. var. *tchihatchewii* (Boiss.) E.Hossain  
Pirreşit Mountain, south slopes, steppe, 2400 m, 08 vi 1997, *MÜ* 1373. Kr.
- T. transcaucasicum** (Manden.) Pobed.  
Between Adaklı village and Sultan Lake, meadow, 1800-2500 m, 11 vii 1997, *MÜ* 1537. Hk.
- T. monticulum** (Boiss. & É.Huet) Bornm.  
Between Adaklı village and Sultan Lake, meadow, 2500 m, 11 vii 1998, *Behçet* 5716. Hk. En.-LC.
- T. disciforme** (C.A.Mey.) Sch.Bip.  
Between Topuzarza and Karaoğlan villages, meadow, 1900 m, 19 x 1997, *MÜ* 2268. Hk. Ir.-Tur.
- Artemisia vulgaris** L.  
Muradiye Waterfall, stream side, 1800 m, 18 x 1997, *MÜ* 21432. Kh.
- A. austriaca** J.Jacq.  
Between Topuzarza and Kocasapan villages, roadside, 1800 m, 26 x 1997, *MÜ* 2296. Kh.
- ▲ **A. campestris** L.  
Between Muradiye town and Yakıncak village, field edges, 1800 m, 06 x 1997, *MÜ* 2037. T.
- A. marschalliana** Spreng.  
Muradiye Waterfall, stream side, 1800 m, 18 x 1997, *MÜ* 2314. Kh.
- A. scoparia** Waldst. & Kit Tan  
Muradiye Waterfall, stream side, 1800 m, 18 x 1997, *MÜ* 2313. Kh.
- A. santonicum** L.  
Between Muradiye town and Yumaklı village, steppe, 1716 m, 06 x 1997, *MÜ* 2058. Kh. Euro-Sib.
- A. taurica** Willd.  
Between Topuzarza and Kocasapan villages, roadside, 1800 m, 26 x 1997, *MÜ* 2283. Kh.
- A. spicigera** C.Koch.  
Muradiye Waterfall, stream side, 1800 m, 18 x 1997, *MÜ* 2315. Kh. Ir.-Tur.
- Gundelia tournefortii** L. var. *tournefortii*  
Around Yumaklı valley, south slopes, 2200 m, 19 x 1997, *MÜ* 2267. Hk.
- Arctium tomentosum** Mill. var. *glabrum* (Körn.) Arènes  
Between Topuzarza and Kocasapan villages, roadside, 1800 m, 26 x 1997, *MÜ* 2292. Hk.
- Onopordum polycephalum** Boiss.  
Between Topuzarza and Kocasapan villages, roadside, 1800 m, 26 x 1997, *MÜ* 2293. Hk. En.-LC. Ir.-Tur.
- O. turcicum** Danin  
Around Yumaklı valley, south slopes, 2200 m, 19 x 1997, *MÜ* 2257. Hk. Ir.-Tur.
- Cirsium tomentosum** C.A.Mey.  
Around Yakıncak valley, rocky slopes, 2200 m, 19 x 1997, *MÜ* 2243. Hk.
- C. lappaceum** (M.Bieb.) Fisch. subsp. *lappaceum*  
Between Topuzarza and Kocasapan villages, roadside, 1800 m, 26 x 1997, *MÜ* 2289. Hk.
- C. lappaceum** (M.Bieb.) Fisch. subsp. *anatolicum* Petr.  
Between Topuzarza and Kocasapan villages, roadside, 1800 m, 26 x 1997, *MÜ* 2288. Hk. Ir.-Tur.
- ▲ **C. karduchorum** Petr.  
Between Topuzarza and Kocasapan villages, roadside, 1800 m, 26 x 1997, *MÜ* 2280. Hk. Ir.-Tur.
- C. bracteosum** DC.  
Between Muradiye town and Yumaklı village, steppe, 1716 m, 06 x 1997, *MÜ* 2082. Hk. Ir.-Tur.
- C. pseudobracteosum** P.H.Davis & Parris

Muradiye Waterfall, stream side, 1800 m, 18 x 1997, *MÜ* 2269. Hk. VU. Ir.-Tur.

*C. vulgare* (Savi) Ten.

Between Topuzarpa and Karaoğlan villages, meadow, 1900 m, 19 x 1997, *MÜ* 2279. Hk.

*C. simplex* C.A.Mey. subsp. *armenum* (DC.) Petr.

Between Adaklı village and Sultan Lake, meadows, 1800-2500 m, 11 vii 1997, *MÜ* 1557. Hk.

*C. rhizocephalum* C.A.Mey. subsp. *rhizocephalum*

Between Muradiye town and Yakıncak village, humid areas, 1800 m, 06 x 1997, *MÜ* 2082. Hk. Ir.-Tur.

*C. elodes* M.Bieb.

Muradiye Waterfall, fields, 1800 m, 29 vi 1997, *MÜ* 1472. Hk. Ir.-Tur.

*C. arvense* (L.) Scop. subsp. *vestitum* (Wimm. & Grab.) Petr.

Around Yumaklı village, fields, 1800 m, 29 vi 1997, *MÜ* 2001. Hk.

*Picnomon acarna* (L.) Cass.

Muradiye Castle, steppe, 1820 m, 29 vi 1997, *MÜ* 1988. T. Medit.

*Carduus nutans* L. subsp. *nutans*

Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1849. Hk.

*C. onopordioides* Fisch. ex M.Bieb. subsp. *onopordioides*

Around Adaklı village, meadow, 2400 m, 06 vi 1998, *MÜ* 2529. Hk. VU. Ir.-Tur.

*C. hamulosus* Ehrh. subsp. *hystrix* (C.A.Mey.) Kazmi

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 2889. Hk. Ir.-Tur.

*C. nawaschinii* Bordz.

Muradiye Waterfall, stream side, 1800 m, 18 x 1997, *MÜ* 2119. Hk. Eux. (mt.).

*C. pycnocephalus* L. subsp. *albidus* (M.Bieb.) Kazmi

Muradiye Castle, steppe, 1820 m, 29 vi 1997, *MÜ* 1986. T.

*Serratula radiata* (Waldst. & Kit Tan) M.Bieb. subsp. *biebersteiniana* Iljin ex Grossh.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3765. Hk. Ir.-Tur.

*S. kotschyi* Boiss.

Between Adaklı village and Sultan Lake, meadow, 2500 m, 11 vii 1998, *MÜ* 1611. Hk. Ir.-Tur.

*Acroptilon repens* (L.) DC.

Muradiye Waterfall, roadside, 1800 m, 18 x 1997, *MÜ* 2096. Hk. Ir.-Tur.

*Centaurea virgata* Lam.

Muradiye Waterfall, steppe, 1800 m, 18 x 1997, *MÜ* 2092. Kh. Ir.-Tur.

*C. rhizantha* C.A.Mey.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3962. Kh. Ir.-Tur.

*C. armena* Boiss.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 4000. Hk. En.-LC. Ir.-Tur.

*C. glastifolia* L.

Around Adaklı village, stream sides, 2300 m, 22 vii 1998, *MÜ* 4568. Hk. Ir.-Tur.

*C. pterocaula* Trautv.

Between Adaklı village and Sultan Lake, meadow, 2500 m, 11 vii 1998, *MÜ* 1613. Hk. Ir.-Tur.

*C. demirizii* Wagenitz

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3468. Hk. En.-VU. Ir.-Tur.

*C. spectabilis* (Fisch. & C.A.Mey.) Sch.Bip. var. *spectabilis*

Between Adaklı village and Sultan Lake, steppe, 1800-2500 m, 11 vii 1997, *MÜ* 1523. Hk.

*C. spectabilis* (Fisch. & C.A.Mey.) Sch.Bip. var. *araneosa* (Boiss.) Wagenitz

Pirreşit Mountain, south-west slopes, steppe, 2200 m, 11 vii 1998, *MÜ* 4418. Hk.

*C. aucheri* (DC.) Wagenitz

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3307. Hk. Ir.-Tur.

*C. albonitens* Turrill

Around Beşparmak village, steppe, 2300-2450 m, 17 vii 1997, *MÜ* 1804. Hk.

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

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 2302. T.

*C. iberica* Trev. ex Spreng.

Between Muradiye town and Yakıncak village, field edges, 1800 m, 06 x 1997, *MÜ* 2041. T.

*C. pseudoscabiosa* Boiss. & Buhse subsp. *pseudoscabiosa*

Pirreşit Mountain, summit, alpine steppe, 3000 m, 27 vi 1997, *MÜ* 1971. Hk.

*C. pseudoscabiosa* Boiss. & Buhse subsp. *glehnii* (Trautv.) Wagenitz

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 28 vi 1998, *MÜ* 3538. Hk.

*C. triumfetti* All.

Around Beşparmak village, alpine areas, 2300-2450 m, 17 vii 1997, *MÜ* 1670. Hk.

*C. depressa* M.Bieb.

Around Karaoğlan district, fields, 1800 m, 07 vi 1997, *MÜ* 1235. T.

*Crupina vulgaris* Cass.

Around Muradiye Castle, steppe, 1820 m, 27 vi 1997, *MÜ* 1968. T.

*C. crupinastrum* (Moris) Vis.

Pirreşit Mountain, south slopes, steppe, 2400 m, 08 vi 1997, *MÜ* 1260. T.

*Cnicus benedictus* L. var. *kotschyi* Boiss.

Muradiye Waterfall, fields, 1726-1800 m, 17 v 1997, *MÜ* 1119. T.

*Xeranthemum annuum* L.

Pirreşit Mountain, south slopes, alpine steppe, 3000 m, 17 vii 1997, *MÜ* 1912. T.

*Echinops sphaerocephalus* L. subsp. *sphaerocephalus*

Pirreşit Mountain, north-west slopes, steppe, 2200-2600 m, 11 vii 1998, *MÜ* 1575. Hk. Euro-Sib.

*E. pungens* Trautv. subsp. *transcaucasicus* (Iljin) Hedge

Around Yumaklı valley, south slopes, steppe, 2200 m, 19 x 1997, *MÜ* 2240. Hk. Ir.-Tur.

*E. orientalis* Trautv.

Kandehar district, steppe, 1716 m, 06 x 1997, *MÜ* 2064. Hk. Ir.-Tur.

- Cichorium intybus** L.  
Between Adaklı village and Sultan Lake, fields, 1800-2500 m, 11 vii 1997, *MÜ* 1526. Hk.
- Scorzonera cana** (C.A.Mey.) Hoffm. var. **jacquiniana** (Koch) D.F.Chamb.  
Between Adaklı village and Sultan Lake, meadow, 2500 m, 11 vii 1998, *MÜ* 1602. Hk.
- S. suberosa** C.Koch subsp. **suberosa**  
Between Topuzarpa and Uluşar villages, meadow, 1750 m, 24 v 1997, *MÜ* 1190. Kr. Ir.-Tur.
- S. mollis** M.Bieb. subsp. **mollis**  
Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3612. Kr.
- S. incisa** DC.  
Around Karaoğlan district, steppe, 1800 m, 07 vi 1997, *MÜ* 1345. Kr. Ir.-Tur.
- S. cinerea** Boiss.  
Between Beşparmak and Çakmak villages, meadow, 2600 m, 02 vii 1998, *MÜ* 4237. Hk. Ir.-Tur.
- S. tomentosa** L.  
Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3218. Hk. En.-LC. Ir.-Tur.
- Tragopogon longirostris** Bisch. ex Sch.Bip. var. **longirostris**  
Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3275. Hk.
- T. buphthalmoides** (DC.) Boiss. var. **latifolius** Boiss.  
Pirreşit Mountain, south-west slopes, steppe, 2200 m, 11 vii 1998, *MÜ* 4420. Hk. Ir.-Tur.
- T. reticulatus** Boiss. & É.Huet  
Between Adaklı village and Sultan Lake, fields, 2500 m, 11 vii 1998, *Behçet* 5708. Hk.
- T. aureus** Boiss.  
Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3935. Hk. En.-LC.
- Leontodon hispidus** L. var. **hispidus**  
Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3731. Hk.
- L. crispus** Vill. subsp. **asper** (Waldst. & Kit Tan) Rohlena var. **setulosus** (Hal.) Kupicha  
Around Beşparmak village, steppe, 2300-2450 m, 17 vii 1997, *MÜ* 1897. Hk.
- Picris strigosa** M.Bieb.  
Around Yumaklı valley, south slopes, 2200 m, 19 x 1997, *MÜ* 2192. Hk. Ir.-Tur.
- Sonchus asper** (L.) Hill subsp. **glauscens** (Jord.) Ball  
Muradiye Waterfall, fields, 1800 m, 29 vi 1997, *MÜ* 1475. Hk.
- Pilosella hoppeana** (Schultes) C.H.Schultz & F.W.Schultz subsp. **pilisquama** (N.P.) P.D.Sell & West  
Between Beşparmak and Çakmak villages, meadow, 2600 m, 02 vii 1998, *MÜ* 4381. Hk.
- P. piloselloides** (Vill.) Soják subsp. **megalomastix** (N.P.) P.D.Sell & L.West  
Between Beşparmak and Çakmak villages, meadow, 2600 m, 02 vii 1998, *MÜ* 4304. Hk.
- P. x fallax** (Willd.) Arv.-Touv.  
Between Beşparmak and Çakmak villages, meadow, 2600 m, 02 vii 1998, *MÜ* 4284. Hk.
- P. verruculata** (Link) Soják  
Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1636. Hk.
- Cicerbita adenophora** (Boiss. & Kotschy) Beauverd  
Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1815. Hk. Ir.-Tur.
- Lactuca serriola** L.  
Pirreşit Mountain, south-west slopes, steppe, 2500 m, 19 x 1997, *MÜ* 2171. Hk. Euro-Sib.
- Scariola virinea** (L.) F.W.Schmidt  
Around Yumaklı valley, south slopes, steppe, 2200 m, 19 x 1997, *MÜ* 2260. Hk.
- Lapsana communis** L. subsp. **adenophora** (Boiss.) Rech.f.  
Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3738. Hk.
- L. communis** L. subsp. **intermedia** (M.Bieb.) Hayek  
Between Beşparmak and Çakmak villages, meadow, 2600 m, 02 vii 1998, *MÜ* 2043. Hk.
- Chondrilla juncea** L. var. **juncea**  
Between Yakıncak and Yumaklı villages, field edges, 1800 m, 06 x 1997, *MÜ* 2043. Hk.
- Crepis foetida** L. subsp. **rheoadifolia** (M.Bieb.) Çelak.  
Kandehar district, steppe, 1716 m, 06 x 1997, *MÜ* 2069. T.
- C. sancta** (L.) Babç.  
Around Topuzarpa village, steppe, 1740-1900 m, 24 v 1997, *MÜ* 1186. T.

## CAMPANULACEAE

**Campanula glomerata** L. subsp. **hispidula** (Witasek) Hayek

Between Adaklı village and Sultan Lake, meadow, 1800-2500 m, 11 vii 1997, *MÜ* 1529. Hk. Euro-Sib.

**C. involucreta** Aucher ex A.DC.

Between Adaklı village and Adaklı high-plateau, meadow, 2400 m, 06 vi 1998, *MÜ* 2503. Hk. Ir.-Tur.

**C. coriacea** P.H.Davis

Pirreşit Mountain, near summit, rocky areas, 3000 m, 27 vi 1997, *MÜ* 1960. Hk. En.-LC. Ir.-Tur.

**C. stricta** L. subsp. **stricta**

Pirreşit Mountain, north-west slopes, steppe, 2200-2600 m, 11 vii 1998, *MÜ* 1583. Hk. Ir.-Tur.

**C. stevenii** M.Bieb. subsp. **stevenii**

Pirreşit Mountain, near summit, alpine steppe, 3000 m, 27 vi 1997, *MÜ* 1431. Kr. H. Eux.

**C. stevenii** M.Bieb. subsp. **beauverdiana** (Fomin) Rech.f. & Schiman-Czeika

Around Yakıncak valley, south slopes, 1800 m, 07 vi 1997, *MÜ* 1298. Kr. Ir.-Tur.

**Asyneuma lobelioides** (Willd.) Hand.-Mazz.

Pirreşit Mountain, lower parts of slopes, steppe, 2400 m, 19 x 1997, *MÜ* 2215. Hk. Ir.-Tur.

▲**A. eximium** Rech.f.

Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1672. Hk. En.-NT. E.Medit.

**A. rigidum** (Willd.) Grossh. subsp. **rigidum**

Köseveli Hill, north slopes, meadow, 2300 m, 17 vii 1997, *MÜ* 1724. Hk. Ir.-Tur.

**A. pulchellum** (Fisch. & C.A.Mey.) Bornm

Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1691. Hk. Ir.-Tur.

**A. virgatum** (Labill.) Bornm. subsp. **virgatum**

Köseveli Hill, north slopes, meadow, 2300 m, 17 vii 1997, *MÜ* 1703. Hk.

**PRIMULACEAE**

**Primula veris** L. subsp. **macrocalyx** (Bunge) Lüdi

Around Beşparmak village, meadow, 2400 m, 26 iv 1998, *MÜ* 2321. Hk. Euro-Sib.

**P. auriculata** Lam.

Around Adaklı village, stream side, 2400 m, 09 v 1998, *MÜ* 2358. Hk. Ir.-Tur.

**Androsace maxima** L.

Around Korug district, rocky slopes, 1716-1800 m, 01 v 1997, *MÜ* 1031. T.

**Lysimachia vulgaris** L.

Pirreşit Mountain, south-west slopes, stream side, 2200 m, 11 vii 1998, *MÜ* 4405. Hk.

**GENTIANACEAE**

**Centaureum pulchellum** (Sw.) Druce

Pirreşit Mountain, near summit, alpine steppe, 3000 m, 30 vi 1998, *MÜ* 3147. T.

**CONVOLVULACEAE**

**Convolvulus compactus** Boiss.

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 2964. Hk.

**C. arvensis** L.

Muradiye Waterfall, stream side, 1800 m, 18 x 1997, *MÜ* 2330. Hk.

**CUSCUTACEAE**

**Cuscuta planiflora** Ten.

Muradiye Waterfall, steppe, on *Reseda lutea* var. *lutea*, 1800 m, 18 x 1997, *MÜ* 2118. Hk.

**BORAGINACEAE**

**Heliotropium dolosum** De Not.

Between Muradiye town and Yakıncak village, field edges, 1800 m, 06 x 1997, *MÜ* 2007b. T.

**Lappula barbata** (M.Bieb.) Gürke

Around Beşparmak village, steppe, 2300-2450 m, 17 vii 1997, *MÜ* 1902. Hk. Ir.-Tur.

**L. squarrosa** (Retz.) Dumort.

Around Beşparmak village, steppe, 2300-2450 m, 17 vii 1997, *MÜ* 1891. Hk.

**Rochelia disperma** (L.f.) C.Koch var. **microcalycina** (Bornm.) J.R.Edm.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3423. T. En.-LC. Ir.-Tur.

**Asperugo procumbens** L.

Between Yumaklı and Beydağı villages, humid areas, 1750-1900 m, 11 v 1997, *MÜ* 1087. T. Euro-Sib.

**Myosotis incrassata** Guss.

Pirreşit Mountain, south slopes, 2400 m, 08 vi 1997, *MÜ* 1341. T. E.Medit.

**M. ramosissima** Rochel ex Schult. subsp. **ramosissima**

Around Adaklı village, meadow, 2400 m, 10 v 1998, *MÜ* 2394. T.

**M. alpestris** F.W.Schmidt subsp. **alpestris**

Around Adaklı village, meadow, 2400 m, 10 v 1998, *MÜ* 2393. Hk.

**M. sicula** Guss.

Between Adaklı village and Sultan Lake, meadow, 2500 m, 11 vii 1998, *Behçet* 5689. T.

**M. platyphylla** Boiss.

Pirreşit Mountain, south slopes, meadow, 2400 m, 08 vi 1997, *MÜ* 1324. Kr. En.-VU. Ir.-Tur.

**Paracaryum cristatum** (Schreb.) Boiss. subsp. **cristatum**

Between Adaklı village and Adaklı high-plateau, steppe, 2400 m, 06 vi 1998, *MÜ* 2733. Hk. En.-LC. Ir.-Tur.

**P. cristatum** (Schreb.) Boiss. subsp. **carduchorum** R.R.Mill

Muradiye Castle, steppe, 1820 m, 27 vi 1997, *MÜ* 1979. Hk. Ir.-Tur.

**P. strictum** (C.Koch.) Boiss.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3494. Hk. Ir.-Tur.

**Rindera caespitosa** (A.DC.) Bunge

Around Yakıncak valley, south slopes, steppe, 1800 m, 07 vi 1997, *MÜ* 1292. Hk. En.-LC. Ir.-Tur.

**R. lanata** (Lam.) Bunge var. **lanata**

Pirreşit Mountain, south slopes, steppe, 2400 m, 08 vi 1997, *MÜ* 1337. Hk.

**R. lanata** (Lam.) Bunge var. **canescens** (A.DC.) Kusn.

Around Topuzarpa village, steppe, 1740-1900 m, 24 v 1997, *MÜ* 1183. Hk. Ir.-Tur.

**R. albida** (Wettst.) Kusn.

Muradiye Waterfall, fields, 1800 m, 29 vi 1997, *MÜ* 1489. Hk. Ir.-Tur.

**Solenanthus circinnatus** Ledeb.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3332. Hk. Ir.-Tur.

**S. stamineus** (Desf.) Wettst.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3351. Hk.

- Cynoglossum officinale* L.  
Between Beşparmak village and Köseveli Hill, meadow, 2400 m, 17 vii 1997, *MÜ* 1749. Hk. Euro-Sib.
- C. vanense* Sutorý  
Around Adaklı village, steppe, 2300 m, 22 vii 1998, *MÜ* 4533. Hk. En.-NT.
- Arnebia decumbens* (Vent.) Coss. & Kralik  
Between Adaklı village and Adaklı high plateau, steppe, 2400 m, 06 vi 1998, *MÜ* 2702. T. Ir.-Tur.
- Buglossoides arvensis* (L.) Johnston  
Around Topuzarpa village, fields, 1740-1900 m, 24 v 1997, *MÜ* 1180. T.
- Neatostema apulum* (L.) Johnston  
Muradiye Mountain, south slopes, steppe, 1900 m, 09 v 1998, *MÜ* 2342. T. Medit.
- Echium italicum* L.  
Muradiye Waterfall, roadside, 1800 m, 18 x 1997, *MÜ* 2101. Hk. Medit.
- Onosma polioxanthum* Rech.f.  
Muradiye Castle, steppe, 2152 m, 28 vi 1997, *MÜ* 1448. Hk. En.-LC. Ir.-Tur.
- O. nemoricolum* Hausskn. & Bornm. ex Bornm.  
Between Adaklı village and Sultan Lake, steppe, 2500 m, 28 vi 1998, *MÜ* 4228. Hk. Ir.-Tur.
- O. tinctorium* M.Bieb.  
Pirreşit Mountain, south slopes, steppe, 2400 m, 08 vi 1997, *MÜ* 1421. Hk. VU. Euro-Sib.
- O. isauricum* Boiss. & Heldr.  
Around Adaklı village, meadow, 2400 m, 10 v 1998, *MÜ* 2385. Hk. En.-LC. Ir.-Tur.
- Cerintho minor* L. subsp. *auriculata* (Ten.) Domac  
Muradiye Waterfall, fields, 1800 m, 29 vi 1997, *MÜ* 1456. Hk.
- C. glabra* Mill.  
Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3868. Hk. Euro-Sib.
- Anchusa azurea* Mill. var. *azurea*  
Between Topuzarpa and Kocasapan villages, roadside, 1800 m, 26 x 1997, *MÜ* 2287. Hk.
- Nonea pulla* (L.) DC. subsp. *scabrisquamata* A.Baytop.  
Between Adaklı village and Adaklı high plateau, meadow, 2400 m, 06 vi 1998, *MÜ* 2711. Hk. Ir.-Tur.
- ▲*N. stenosolen* Boiss. & Ball  
Between Adaklı village and Adaklı valley, rocky area, 2400 m, 19 v 1998, *MÜ* 2362. Hk. En.-LC. Ir.-Tur.
- Alkanna orientalis* (L.) Boiss. var. *orientalis*  
Around Karaoğlan district, rocky area, 1716-1750 m, 30 iv 1997, *MÜ* 1018. Hk. Ir.-Tur.
- SOLANACEAE**
- Hyoscyamus niger* L.  
Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 2959. Hk.
- H. reticulatus* L.  
Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3778. Hk. Ir.-Tur.
- SCROPHULARIACEAE**
- ▲*Verbascum suworowianum* (C.Koch) Kuntze var. *suworowianum*  
Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3235. Hk. VU. Ir.-Tur.
- V. oreophilum* C.Koch. var. *joannis* (Bordz.) Hub.-Mor.  
Between Adaklı village and Sultan Lake, meadow, 2500 m, 11 vii 1998, *Behçet* 5731. Hk. Ir.-Tur.
- V. phoeniceum* L.  
Between Topuzarpa and Uluşar villages, steppe, 1750 m, 24 v 1997, *MÜ* 1225. Hk.
- ▲*V. decursivum* Hub.-Mor.  
Muradiye Castle, steppe, 2152 m, 28 vi 1997, *MÜ* 1446. Hk. En.-EN. Ir.-Tur.
- The species is known only from the type collection. The habitats of the species are under threat due to cutting of plant material (for fuel) and field clearing.
- V. cheiranthifolium* Boiss. var. *cheiranthifolium*  
Between Adaklı village and Sultan Lake, meadow, 2500 m, 11 vii 1998, *MÜ* 1539. Hk.
- Scrophularia chrysantha* Jaub. & Spach  
Around Korug district, rocky slopes, 1716-1800 m, 01 v 1997, *MÜ* 1053. Hk. Eux.
- S. ilwensis* C.Koch  
Pirreşit Mountain, south slopes, meadow, 2400 m, 08 vi 1997, *MÜ* 1278. T. Ir.-Tur.
- S. chlorantha* Kotschy & Boiss.  
Between Beşparmak and Çakmak villages, meadow, 2600 m, 02 vii 1998, *MÜ* 4252. Hk. Ir.-Tur.
- S. atropatana* Grossh.  
Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3390. Hk. VU. Ir.-Tur.
- This species is known from a few localities in South-west Asia, but the habitats of the species are on the decline due to overgrazing in East Anatolia.
- S. libanotica* Boiss. var. *cappadocica* R.R.Mill  
Pirreşit Mountain, south slopes, steppe, 2400 m, 08 vi 1997, *MÜ* 1393. Hk. En.-LC. Ir.-Tur.
- S. libanotica* Boiss. subsp. *libanotica* var. *urartuënsis* R.R.Mill  
Between Yumaklı and Beydağı villages, rocky areas, 1750-1900 m, 11 v 1997, *MÜ* 1060. Hk. En.-LC. Ir.-Tur.
- S. cinerascens* Boiss.  
Pirreşit Mountain, south slopes, alpine steppe, 3000 m, 17 vii 1997, *MÜ* 1922. Hk.
- Linaria chalapensis* (L.) Mill. var. *chalapensis*  
Muradiye Hill, south slopes, steppe, 1900 m, 09 v 1998, *MÜ* 2352. T. E.Medit.
- L. kurdica* Boiss. & Hohen. subsp. *kurdica*  
Between Beşparmak village and Köseveli Hill, steppe, 2400 m, 17 vii 1997, *MÜ* 1754. Hk. Ir.-Tur.
- L. pyramidata* (Lam.) Spreng.  
Between Beşparmak and Çakmak villages, meadow, 2600 m, 02 vii 1998, *MÜ* 4395. Hk. Ir.-Tur.



**L. simplex** (Willd.) DC.

Around Yakıncak valley, south slopes, steppe, 1800 m, 08 vi 1997, *MÜ* 1285. T.

**Veronica reuterana** Boiss.

Pirreşit Mountain, south-west slopes, stream side, 2000 m, 30 vi 1998, *MÜ* 3823. T. Ir.-Tur.

**V. pusilla** Kotschy var. **pusilla**

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3764. T. Ir.-Tur.

**V. verna** L.

Between Adaklı village and Sultan Lake, meadow, 2400 m, 10 v 1998, *MÜ* 2431. T. Euro-Sib.

**V. biloba** Schreb.

Between Adaklı village and Adaklı high-plateau, meadow, 2400 m, 06 vi 1998, *MÜ* 2577. T. Ir.-Tur.

**V. bornmuelleri** Hausskn.

Between Adaklı village and Adaklı high-plateau, meadow, 2400 m, 06 vi 1998, *MÜ* 2865. T. Ir.-Tur.

**V. campylopoda** Boiss.

Pirreşit Mountain, south-west slopes, meadow, 2000 m, 30 vi 1998, *MÜ* 3276. T. Ir.-Tur.

**V. intercedens** Bornm.

Between Adaklı village and Adaklı high-plateau, meadow, 2400 m, 06 vi 1998, *MÜ* 2607. T. Ir.-Tur.

**V. anagallis-aquatica** L. subsp. **anagallis-aquatica**

Between Beşparmak and Çakmak villages, stream side, 2600 m, 02 vii 1998, *MÜ* 4336. Hk.

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

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3352. Kh.

**V. orientalis** Mill. subsp. **carduchorum** P.H.Davis ex M.A.Fisch.

Pirreşit Mountain, south slopes, 2400 m, 08 vi 1997, *MÜ* 1344. Kh. En.-LC. Ir.-Tur.

**Lagotis stolonifera** (C.Koch) Maxim.

Around Korug district, humid areas, 1716-1800 m, 01 v 1997, *MÜ* 1038. Kh. Ir.-Tur.

**Euphrasia pectinata** Ten.

Between Adaklı village and Sultan Lake, meadow, 1800-2500 m, 11 vii 1997, *MÜ* 1504. T. Euro-Sib.

**Pedicularis caucasica** M.Bieb.

Pirreşit Mountain, near summit, alpine steppe, 2900 m, 08 vi 1997, *MÜ* 1407. Hk. H.Eux. (mt.).

**P. comosa** L. var. **sibthorpii** (Boiss.) Boiss.

Pirreşit Mountain, south slopes, meadows, 2400 m, 08 vi 1997, *MÜ* 1408. Hk.

**Rhinanthus angustifolius** C.C.Gmel. subsp. **grandiflorus** (Wallr.) D.A.Webb

Around Adaklı village, meadows, 2500 m, 20 vi 1998, *MÜ* 2944. T.

**Bungea trifida** (Vahl) C.A.Mey.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3247. Kh. Ir.-Tur.

**OROBANCHACEAE**

**Phelypaea coccinea** (M.Bieb.) Poir.

Muradiye Waterfall, steppe, 1800 m, 19 v 1998, *MÜ* 2432. Hk. Ir.-Tur.

**Orobanche aegyptiaca** Pers.

Between Adaklı village and Adaklı high plateau, steppe, 2400 m, 06 vi 1998, *MÜ* 2665. Hk.

**O. coelestis** (Reut.) Beck

Between Beşparmak village and Köseveli Hill, steppe, 2400 m, 17 vii 1997, *MÜ* 1650. Hk.

**O. caesia** Reichb.

Around Beşparmak village, steppe, 2300-2450 m, 17 vii 1997, *MÜ* 1828. Hk.

**O. caucasica** Beck

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3474. Hk.

**O. arenaria** Borkh.

Köseveli Hill, north slopes, steppe, 2300 m, 17 vii 1997, *MÜ* 1698. Hk.

**O. minor** Sm.

Between Adaklı village and Sultan Lake, steppe, 1800-2500 m, 11 vii 1997, *MÜ* 1571. Hk.

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

Between Beşparmak village and Köseveli Hill, steppe, 2400 m, 17 vii 1997, *MÜ* 1722. Hk. Ir.-Tur.

**O. armena** Tzvelev

Between Adaklı village and Adaklı high-plateau, meadow, 2400 m, 06 vi 1998, *MÜ* 2660. Hk. En.-EN. Ir.-Tur.

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

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 3002. Hk.

**ACANTHACEAE**

**Acanthus dioscoridis** L. var. **dioscoridis**

Between Adaklı village and Sultan Lake, meadow, 1800-2500 m, 11 vii 1997, *MÜ* 1525. Hk.

**GLOBULARIACEAE**

**Globularia trichosantha** Fisch. & C.A.Mey.

Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1645. Hk.

**LAMIACEAE (LABIATAE)**

**Ajuga chamaepitys** (L.) Schreb. subsp. **chia** (Schreb.) Arcang. var. **chia**

Pirreşit Mountain, near summit, alpine steppe, 2900 m, 08 vi 1997, *MÜ* 1969. Hk.

**Teucrium orientalis** L. var. **orientalis**

Between Beşparmak village and Köseveli Hill, steppe, 2400 m, 17 vii 1997, *MÜ* 1853. Hk. Ir.-Tur.

**T. orientalis** L. var. **puberulens** Ekim

Between Beşparmak and Çakmak villages, steppe, 2600 m, 02 vii 1998, *MÜ* 4319. Hk. Ir.-Tur.

**T. polium** L.

Muradiye Waterfall, steppe, 1800 m, 18 x 1997, *MÜ* 2102. Hk.

**Scutellaria orientalis** L. subsp. **virens** (Boiss. & Kotschy) J.R.Edm.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3862. Kh. Ir.-Tur.

*S. orientalis* L. subsp. *sosnowskyi* (Takt.) Fed.

Between Adaklı village and Sultan Lake, meadow, 1800-2500 m, 11 vii 1997, *MÜ* 1596. Kh. Ir.-Tur.

*S. orientalis* L. subsp. *alpina* (Boiss.) O.Schwarz var. *glandulosissima* O.Schwarz

Pirreşit Mountain, north-west slopes, steppe, 2200-2600 m, 11 vii 1998, *MÜ* 1585.En.-NT. Kh.

*S. orientalis* L. subsp. *bornmuelleri* (Hauskn. ex Bornm.) J.R.Edm.

Between Adaklı village and Sultan Lake, meadow, 2500 m, 28 vi 1998, *MÜ* 4203. Kh. Ir.-Tur.

*Phlomis tuberosa* L.

Around Beşparmak village, steppe, 2300-2450 m, 17 vii 1997, *MÜ* 1635. Kr.

*P. armeniaca* Willd.

Köseveli Hill, north slopes, steppe, 2300 m, 17 vii 1997, *MÜ* 1796. Hk. En.-LC. Ir.-Tur.

*Lamium garganicum* L. subsp. *reniforme* (Montbret & Aucher ex Benth.) R.R.Mill

Köseveli Hill, north slopes, rocky areas, 2300 m, 17 vii 1997, *MÜ* 1716. Hk.

*L. amplexicaule* L.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3346. T. Euro-Sib.

*L. macrodon* Boiss. & É.Huet

Around Karaoğlan district, fields, 1750 m, 14 iv 1997, *MÜ* 1008. T. Ir.-Tur.

*L. album* L.

Pirreşit Mountain, south slopes, steppe, 2400 m, 08 vi 1997, *MÜ* 1417. Hk. Euro-Sib.

*Leonurus glaucescens* Bunge

Pirreşit Mountain, near summit, stream side, 3000 m, 27 vi 1997, *MÜ* 1975. Hk. Ir.-Tur.

*Marrubium cordatum* Nábělek

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3867. Hk.

*Stachys balansae* Boiss. & Kotschy subsp. *balansae*

Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1630. Hk.

*S. lavandulifolia* Vahl var. *lavandulifolia*

Muradiye Waterfall, steppe, 1726-1800 m, 17 v 1997, *MÜ* 1106. Kh. Ir.-Tur.

*S. lavandulifolia* Vahl var. *brachyodon* Boiss.

Pirreşit Mountain, near summit, alpine steppe, 3000 m, 30 vi 1998, *MÜ* 3183. Kh. Ir.-Tur.

*S. lavandulifolia* Vahl var. *glabrescens* R.Bhattacharjee & Hub.-Mor.

Around Topuzarpa village, steppe, 1740-1900 m, 24 v 1997, *MÜ* 1175. Kh. Ir.-Tur.

*S. recta* L. subsp. *subcrenata* (Vis.) Briq.

Pirreşit Mountain, near summit, alpine steppe, 3000 m, 27 vi 1997, *MÜ* 1977. Hk. Medit.

*S. iberica* M.Bieb. subsp. *iberica* var. *iberica*

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 3002. Kh. Ir.-Tur.

*S. iberica* M.Bieb. subsp. *georgica* Rech.

Between Adaklı village and Sultan Lake, steppe, 1800-2500 m, 11 vii 1997, *MÜ* 1599b. Kh. Ir.-Tur.

*S. iberica* M.Bieb. subsp. *stenostachya* (Boiss.) Rech.f.

Between Adaklı village and Sultan Lake, steppe, 1800-2500 m, 11 vii 1997, *MÜ* 1599a. Kh. Ir.-Tur.

*S. annua* (L.) L. subsp. *annua* var. *annua*

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 3063. Hk.

*Nepeta nuda* L. subsp. *albiflora* (Boiss.) Gams

Between Beşparmak village and Köseveli Hill, humid places, 2400 m, 17 vii 1997, *MÜ* 1711. Hk.

*N. racemosa* Lam.

Around Adaklı village, steppe, 2400 m, 10 v 1998, *MÜ* 2370. Hk. Ir.-Tur.

*N. transcaucasica* Grossh.

Pirreşit Mountain, south slopes, steppe, 1800 m, 07 vi 1997, *MÜ* 1282. Hk. Ir.-Tur.

*N. fissa* C.A.Mey.

Around Yumaklı valley, south slopes, steppe, 2200 m, 19 x 1997, *MÜ* 2236. Hk. Ir.-Tur.

*Lallemantia peltata* (L.) Fisch. & C.A.Mey.

Pirreşit Mountain, south slopes, fields, 2400 m, 08 vi 1997, *MÜ* 1424. T. Ir.-Tur.

*L. iberica* (M.Bieb.) Fisch. & C.A.Mey.

Pirreşit Mountain, south slopes, steppe, 2400 m, 08 vi 1997, *MÜ* 1335. T. Ir.-Tur.

*Prunella vulgaris* L.

Between Beşparmak and Çakmak villages, meadow, 2600 m, 02 vii 1998, *MÜ* 4371. Hk. Euro-Sib.

*Acinos rotundifolius* Pers.

Between Adaklı village and Adaklı high plateau, steppe, 2400 m, 06 vi 1998, *MÜ* 2845. T.

*Thymus transcausicus* Ronniger

Pirreşit Mountain, near summit, alpine steppe, 2900 m, 08 vi 1997, *MÜ* 1434. Hk. VU.

*T. kotschyanus* Boiss. & Hohen. subsp. *kotschyanus*

Around Beşparmak village, steppe, 2300-2450 m, 17 vii 1997, *MÜ* 1623. Kr.

*T. kotschyanus* Boiss. & Hohen. subsp. *glabrescens* Boiss.

Pirreşit Mountain, near summit, alpine steppe, 3000 m, 27 vi 1997, *MÜ* 1976. Kh. Ir.-Tur.

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

Around Yumaklı valley, stream side, 2200 m, 19 x 1997, *MÜ* 2185. Kr.

*Ziziphora clinopodioides* Lam.

Between Adaklı village and Sultan Lake, steppe, 1800-2500 m, 11 vii 1997, *MÜ* 1592. Kh.

*Z. capitata* L.

Pirreşit Mountain, south slopes, steppe, 2400 m, 08 vi 1997, *MÜ* 1395. T. Ir.-Tur.

*Salvia multicaulis* Vahl

Muradiye Waterfall, steppe, 1726-1800 m, 17 v 1997, *MÜ* 1105. Hk. Ir.-Tur.

*S. brachyantha* (Bordz.) Pobed

Between Adaklı village and Sultan Lake, steppe, 1800-2500 m, 11 vii 1997, *MÜ* 1569. Hk. Ir.-Tur.

*S. poculata* Nábëlek

Pirreşit Mountain, south slopes, steppe, 2400 m, 08 vi 1997, *MÜ* 1410. Hk. Ir.-Tur.

*S. limbata* C.A.Mey.

Muradiye Castle, steppe, 2152 m, 28 vi 1997, *MÜ* 1441. Hk. Ir.-Tur.

*S. staminea* Montbret & Aucher ex Benth

Between Adaklı village and Sultan Lake, meadow, 1800-2500 m, 11 vii 1997, *Behçet* 5705. Hk. Ir.-Tur.

*S. virgata* Jacq.

Around Topuzarpa village, meadow, 1740-1900 m, 24 vi 1997, *MÜ* 1185. Hk. Ir.-Tur.

*S. nemorosa* L.

Pirreşit Mountain, near summit, alpine steppe, 2900 m, 08 vi 1997, *MÜ* 1913. Hk.

*S. verticillata* L. subsp. *verticillata*

Pirreşit Mountain, near summit, alpine steppe, 3000 m, 27 vi 1997, *MÜ* 1957. Hk. Euro-Sib.

PLUMBAGINACEAE

*Plumbago europaea* L.

Muradiye Waterfall, steppe, 1800 m, 18 x 1997, *MÜ* 2129. Hk. Euro-Sib.

*Acantholimon bracteatum* (Girard) Boiss. var. *bracteatum*

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3694. Kh. Ir.-Tur.

*A. bracteatum* (Girard) var. *capitatum* (Sosn.) Bokhari

Between Beşparmak village and Köseveli Hill, steppe, 2400 m, 17 vii 1997, *MÜ* 1656. Kh. En.-LC. Ir.-Tur.

*A. acerosum* (Willd.) Boiss. var. *acerosum*

Around Beşparmak village, meadow, 2400 m, 11 vii 1997, *MÜ* 1520. Kh. Ir.-Tur.

*A. caryophyllaceum* Boiss. subsp. *caryophyllaceum*

Around Adaklı village, steppe, 2300 m, 22 vii 1998, *MÜ* 4519. Kh.

PLANTAGINACEAE

*Plantago major* L. subsp. *major*

Pirreşit Mountain, south slopes, meadow, 2400 m, 08 vi 1997, *MÜ* 1394. Hk.

*P. major* L. subsp. *intermedia* (Gilib.) Lange

Pirreşit Mountain, south slopes, meadow, 2400 m, 08 vi 1997, *MÜ* 1419. Hk.

*P. media* L.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3309. Hk.

*P. atrata* Hoppe

Muradiye Waterfall, steppe, 1800 m, 18 x 1997, *MÜ* 2112. Hk.

*P. lanceolata* L.

Muradiye Waterfall, stream side, 1726-1800 m, 17 v 1997, *MÜ* 1118. Hk.

ELAEAGNACEAE

*Elaeagnus angustifolia* L.

Between Beşparmak village and Köseveli Hill, roadside, 2400 m, 17 vii 1997, *MÜ* 1917. Fh.

SANTALACEAE

*Thesium procumbens* C.A.Mey.

Pirreşit Mountain, west slopes, steppe, 2500 m, 22 vii 1998, *MÜ* 2933. Hk.

ARISTOLOCHIACEAE

*Aristolochia bottae* Jaub. & Spach

Between Topuzarpa and Kocasapan villages, roadsides, 1800 m, 30 vi 1998, *MÜ* 3488. Hk. Ir.-Tur.

EUPHORBIACEAE

*Euphorbia macroclada* Boiss.

Around Kandeher district, steppe, 1716 m, 06 x 1997, *MÜ* 2068. Hk. Ir.-Tur.

*E. heteradena* Boiss.

Muradiye Castle, steppe, 2152 m, 28 vi 1997, *MÜ* 1442. Hk. Ir.-Tur.

*E. virgata* Waldst. & Kit Tan

Around Yumaklı valley, south slopes, steppe, 2200 m, 19 x 1997, *MÜ* 2202. Hk.

URTICACEAE

*Urtica dioica* L.

Around Adaklı village, stream side, 2300 m, 17 vii 1998, *MÜ* 1738. Hk. Euro-Sib.

*Parietaria judaica* L.

Muradiye Waterfall, rocks, 1800 m, 29 vi 1997, *MÜ* 1483. Hk.

SALICACEAE

*Salix alba* L.

Between Adaklı village and Sultan Lake, meadow, 2400 m, 10 v 1998, *MÜ* 2426. Fh. Euro-Sib.

*S. caprea* L.

Around Yumaklı valley, south slopes, meadow, 2200 m, 19 x 1997, *MÜ* 2197. Fh. Euro-Sib.

RUBIACEAE

*Asperula laxiflora* Boiss.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3914. Kh. Eux.(mt.).

*A. glomerata* (M.Bieb.) Griseb. subsp. *condensata* (Ehrend.) Ehrend. var. *condensata*

Between Adaklı village and Adaklı high plateau, steppe, 2400 m, 06 vi 1998, *MÜ* 2561. Hk. Ir.-Tur.

*A. arvensis* L.

Between Beşparmak village and Köseveli Hill, fields, 2400 m, 17 vii 1997, *MÜ* 1795. T. Medit.

*Galium humifusum* M.Bieb.

Pirreşit Mountain, near summit, alpine steppe, 2900 m, 08 vi 1997, *MÜ* 1966a. Kh.

*G. verum* L. subsp. *verum*

Muradiye Waterfall, steppe, 1800 m, 29 vi 1997, *MÜ* 1461. Kh. Euro-Sib.

*G. verum* L. subsp. *glabrescens* Ehrend.

Between Beşparmak village and Köseveli Hill, steppe, 2400 m, 17 vii 1997, *MÜ* 1775. Kh. Ir.-Tur.

*G. mite* Boiss. & Hohen.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3300. Kh. Ir.-Tur.

*G. nabelekii* Ehrend. & Schönb.-Tem.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3957. Hk. Ir.-Tur.

*G. incanum* Sm. subsp. *elatus* (Boiss.) Ehrend.

Between Beşparmak village and Köseveli Hill, meadow, 2400 m, 17 vii 1997, *MÜ* 1852. Kh. Ir.-Tur.

*G. spurium* L. subsp. *ibicinum* (Boiss. & Hausskn. ex Boiss.) Ehrend.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3398. T. Ir.-Tur.

*G. tricornutum* Dandy

Pirreşit Mountain, near summit, fields, 2900 m, 08 vi 1997, *MÜ* 1966b. T. Medit.

*Callipeltis cucullaria* (L.) Steven

Pirreşit Mountain, near summit, steppe, 2900 m, 08 vi 1997, *MÜ* 1959. T. Ir.-Tur.

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

Around Yakıncak valley, south slopes, steppe 1800 m, 07 vi 1997, *MÜ* 1311. Kh. Ir.-Tur.

## MONOCOTYLEDONES

### ALISMATACEAE

*Alisma plantago-aquatica* L.

Around Beşparmak village, stream sides, 2300-2450 m, 17 vii 1997, *MÜ* 1896. Hk. Euro-Sib.

### ARACEAE

*Arum detrunctatum* C.A.Mey. ex Schott var. *virescens* (Stapf) Alpinar & R.R.Mill

Around Karaoğlan district, rocky area, 1716-1750 m, 30 iv 1997, *MÜ* 1019. Kr. Ir.-Tur.

### LEMNACEAE

*Lemna minor* L.

Between Topuzarpa and Karaoğlan villages, pools, 1900 m, 19 x 1997, *MÜ* 2274. Kr.

## LILIACEAE

*Allium flavum* L. subsp. *tauricum* (Besser ex Reichb.) Stearn var. *tauricum*

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3967. Kr. Medit.

▲*A. armenum* Boiss. & Kotschy

Between Adaklı village and Sultan Lake, steppe, 2500m, 28 vi 1998, *MÜ* 4229. Kr. En.-LC. Ir.-Tur.

*A. atroviolaceum* Boiss.

Muradiye Waterfall, fields, 1800 m, 29 vi 1997, *MÜ* 1427. Kr.

*A. fuscoviolaceum* Fomin

Around Adaklı village, stream sides, 2300 m, 22 vii 1998, *MÜ* 4545. Kr. Ir.-Tur.

*A. vineale* L.

Pirreşit Mountain, south-west slopes, steppe, 2200 m, 11 vii 1998, *MÜ* 4471. Kr.

*A. guttatum* Steven subsp. *guttatum*

Around Muradiye Waterfall, fields, 1800 m, 29 vi 1997, *MÜ* 1426a. Kr.

*A. guttatum* Steven subsp. *sardoum* (Moris) Stearn

Around Muradiye Waterfall, fields, 1800 m, 29 vi 1997, *MÜ* 1426b. Kr. Medit.

*A. akaka* S.G.Gmel.

Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1813. Kr. Ir.-Tur.

*A. cardiostemon* Fisch. & C.A.Mey.

Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1889. Kr. Ir.-Tur.

*A. kharputense* Freyn & Sint.

Around Topuzarpa village, steppe, 1740-1900 m, 24 v 1997, *MÜ* 1192. Kr. Ir.-Tur.

*Puschkinia scilloides* Adams

Around Korug district, steppe, 1716-1800 m, 01 v 1997, *MÜ* 1022. Kr. Ir.-Tur.

*Ornithogalum arcuatum* Steven

Around Muradiye Waterfall, fields, 1800 m, 29 vi 1997, *MÜ* 1428. Kr. Ir.-Tur.

*O. oligophyllum* E.D.Clarke

Around Yumaklı valley, south slopes, 1830 m, 11 v 1997, *MÜ* 1071. Kr.

*Muscari comosum* (L.) Mill.

Between Adaklı village and Adaklı high plateau, meadow, 2400 m, 06 vi 1998, *MÜ* 2459. Kr. Medit.

*M. caucasicum* (Griseb.) Baker

Between Adaklı village and Adaklı high plateau, steppe, 2400 m, 19 v 1998, *MÜ* 2458. Kr. Ir.-Tur.

*M. armeniacum* Leichtlin ex Baker

Around Kocasapan village, steppe, 1750-1800 m, 30 iv 1997, *MÜ* 1033. Kr.

*M. neglectum* Guss.

Between Adaklı village and Adaklı high plateau, steppe, 2400 m, 19 v 1998, *MÜ* 2448. Kr.

*Bellevalia fominii* Woronow

Pirreşit Mountain, south slopes, steppe, 2400 m, 08 vi 1997, *MÜ* 1320. Kr. VU. Ir.-Tur.

*B. longistyla* (Miscz.) Grossh.

Around Topuzarpa village, steppe, 1740-1900 m, 24 v 1997, *MÜ* 1195. Kr. Ir.-Tur.

*B. pycnantha* (C.Koch) A.Los.-Los.

Between Yumaklı and Beydağı villages, steppe, 1750-1900 m, 11 v 1995, *MÜ* 1062. Kr. Ir.-Tur.

*B. rixii* Wendelbo

Around Topuzarpa village, steppe, 1740-1900 m, 24 v 1997, *MÜ* 1191. Kr. En.-EN. Ir.-Tur.

This species is known from a few localities in Turkey. It was collected only at one given locality in the area. The habitat is under threat from over-grazing and field clearing.

*Fritillaria crassifolia* Boiss. & É.Huet subsp. *kurdica* (Boiss. & Noë) Rix

Around Beşparmak village, steppe, 2400 m, 26 iv 1998, *MÜ* 2334. Kr. Ir.-Tur.

*F. minuta* Boiss. & Noë

Around Beşparmak village, steppe, 2400 m, 26 iv 1998, *MÜ* 2322. Kr. Ir.-Tur.

*F. pinardii* Boiss.

Pirreşit Mountain, near summit, alpine steppe, 3000 m, 27 vi 1997, *MÜ* 1403. Kr. Ir.-Tur.

*F. assyriaca* Baker subsp. *assyriaca*

Between Adaklı village and Sultan Lake, steppe, 2400 m, 10 v 1998, *Behçet* 5837. Kr. Ir.-Tur.

*Tulipa humulis* Herb.

Around Beşparmak village, steppe, 2300-2450 m, 17 vii 1997, *MÜ* 1833. Kr.

*T. julia* C.Koch

Between Adaklı village and Adaklı high-plateau, steppe, 2400 m, 19 v 1998, *MÜ* 2464. Kr. Ir.-Tur.

*Gagea gageoides* (Zucc.) Vved.

Around Adaklı village, steppe, 2400 m, 10 v 1998, *MÜ* 2391. Kr. Ir.-Tur.

*G. taurica* Steven

Around Adaklı village, steppe, 2400 m, 10 v 1998, *MÜ* 2390. Kr. Ir.-Tur.

*G. bulbifera* (Pall.) Schult. & Schult.f.

Around Adaklı village, meadow, 2400 m, 10 v 1998, *MÜ* 2391. Kr. Euro-Sib.

*G. uliginosa* Siehe & Pascher

Around Topuzarpa village, steppe, 1750, 14 iv 1997, *MÜ* 1003. Kr. Ir.-Tur.

*G. fistulosa* Ker Gawl.

Around Korug district, rocky slopes, 1716-1800 m, 01 v 1997, *MÜ* 1037. Kr.

*G. glacialis* C.Koch

Around Korug district, rocky slopes, 1716-1800 m, 01 v 1997, *MÜ* 1058. Kr. Ir.-Tur.

*Colchicum szovitsii* Fisch. & C.A.Mey.

Around Beşparmak village, meadow, 2400 m, 26 iv 1998, *MÜ* 2318. Kr. Ir.-Tur.

*C. kotschyi* Boiss.

Around Beşparmak village, meadow, 2400 m, 26 iv 1998, *MÜ* 2316. Kr. Ir.-Tur.

*Merendera trigyna* (Steven ex Adam) Stapf

Pirreşit Mountain, near summit, alpine steppe, 3000 m, 27 vi 1997, *MÜ* 1237. Kr. Ir.-Tur.

AMARYLLIDACEAE

*Ixiolirion tataricum* (Pall.) Herb. subsp. *montanum* (Labill.) Takht.

Around Topuzarpa village, fields, 1740-1900 m, 24 v 1997, *MÜ* 1197. Kr. Ir.-Tur.

IRIDACEAE

*Iris iberica* Hoffm. subsp. *elegantissima* (Sosn.) Takht. & Fedorov

Around Muradiye Waterfall, rocky area, 1800 m, 19 v 1998, *MÜ* 2436. Kr. Ir.-Tur.

*I. paradoxa* Steven

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3306. Kr. Ir.-Tur.

*I. caucasica* Hoffm. subsp. *turcica* B.Mathew

Between Adaklı village and Adaklı high plateau, steppe, 2400 m, 19 v 1998, *MÜ* 2438. Kr. Ir.-Tur.

*C. biflorus* Mill. subsp. *tauri* (Maw) B.Mathew

Around Topuzarpa village, steppe, 1750 m, 14 iv 1997, *MÜ* 1001. Kr. Ir.-Tur.

*Gladiolus atrovioleaceus* Boiss.

Around Karaoğlan district, steppe, 1800 m, 07 vi 1997, *MÜ* 1357. Kr. Ir.-Tur.

ORCHIDACEAE

*Orchis coriophora* L.

Around Karaoğlan district, meadow, 1800 m, 07 vi 1997, *MÜ* 1321. Kr.

*O. tridentata* Scop.

Around Karaoğlan district, meadow, 1800 m, 07 vi 1997, *MÜ* 1313. Kr. Medit.

*O. mascula* (L.) L. subsp. *pinetorum* (Boiss. & Kotschy) E.G.Camus

Between Adaklı village and Adaklı high plateau, steppe, 2400 m, 19 v 1998, *MÜ* 2454. Kr. E.Medit.

*Dactylorhiza urvilleana* (Steud.) Baumann & Künkele

Between Adaklı village and Adaklı high plateau, meadow, 2400 m, 06 vi 1998, *MÜ* 2552. Kr. Eux.

*D. umbrosa* (Kar. & Kir.) Nevski

Around Karaoğlan district, meadow, 1800 m, 07 vi 1997, *MÜ* 1325. Kr. Ir.-Tur.

JUNCACEAE

*Juncus inflexus* L.

Around Beşparmak village, meadow, 2300-2450 m, 17 vii 1997, *MÜ* 1840. Hk.

*J. bufonius* L.

Between Muradiye and Yumaklı villages, steppe, 1716 m, 06 x 1998, *MÜ* 4036. T.

*J. articulatus* L.

Between Topuzarpa and Uluşar villages, meadow, 1750 m, 24. v 1997, *MÜ* 1191. Hk. Euro-Sib.

*J. alpigenus* C.Koch

Pirreşit Mountain, north-west slopes, steppe, 2200-2600 m, 11 vii 1998, *MÜ* 1581. Kr. Eux.

CYPERACEAE

*Cyperus longus* L.

Between Topuzarpa and Kocasapan villages, stream side, 1800 m, 26 x 1997, *MÜ* 2303. Kr.

*Eleocharis palustris* (L.) Roem. & Schult.

Between Adaklı village and Sultan Lake, meadow, 2500 m, 28 vi 1998, *MÜ* 4206. Hk.

*E. uniglumis* (Link) Schult.

Between Beşparmak and Çakmak villages, stream side, 2600 m, 02 vii 1998, *MÜ* 4363. Hk.

*Blysmus compressus* (L.) Panz. ex Link

Around Korug district, steppe, 1716 m, 11 v 1997, *MÜ* 1096. Kr.

*Carex divisa* Huds.

Between Adaklı village and Adaklı high-plateau, meadows, 2400 m, 19 v 1998, *MÜ* 2457. Hk. Euro-Sib.

*C. ovalis* Good

Between Adaklı village and Sultan Lake, meadow, 1800-2500 m, 11 vii 1997, *MÜ* 1546. Hk. Euro-Sib.

▲*C. nigra* (L.) Reichard subsp. *dacica* (Heuff.) Soó

Between Adaklı village and Sultan Lake, meadow, 2500 m, 28 vi 1998, *MÜ* 2424. Kr. Eux.

POACEAE (GRAMINEAE)

*Agropyron cristatum* (L.) Gaertner subsp. *pectinatum* (M.Bieb.) Tzvelev var. *pectinatum*

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3362. Kh.

**A. cristatum** (L.) Gaertner subsp. **pectinatum** (M.Bieb.) Tzvelev var. **imbricatum** (Roem. & Schult.) Beck

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 3035. Kh

**A. cristatum** (L.) Gaertner subsp. **incanum** (Nábělek) Melderis

Between Beşparmak village and Köseveli Hill, steppe, 2400 m, 17 vii 1997, *MÜ* 1872. Kr. Ir.-Tur.

▲**Elymus koshaninii** (Nábělek) Melderis

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3750. Hk. Ir.-Tur.

**E. repens** (L.) Gould subsp. **repens**

Between Adaklı village and Sultan Lake, meadow, 2500 m, 11 vii 1998, *MÜ* 1603. Kr.

**E. repens** (L.) Gould subsp. **elongatiformis** (Drobow) Melderis

Pirreşit Mountain, south-west slopes, steppe, 2200 m, 11 vii 1998, *MÜ* 4476. Kr. Ir.-Tur.

**E. hispidus** (Opiz) Melderis subsp. **hispidus**

Pirreşit Mountain, south-west slopes, steppe, 2200 m, 11 vii 1998, *MÜ* 4432. Kr.

**E. hispidus** (Opiz) Melderis subsp. **barbulatus** (Schur) Melderis

Around Muradiye Waterfall, fields, 1800 m, 29 vi 1997, *MÜ* 1494. Kr.

**Eremopyrum bonaepartis** (Spreng.) Nevski subsp. **hirsutum** (Bertol.) Melderis

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3422. T.

**E. distans** (C.Koch) Nevski

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 2946. T. Ir.-Tur.

**Aegilops cylindrica** Host

Pirreşit Mountain, north slopes, steppe, 3000 m, 27 vi 1997, *MÜ* 1939. T. Ir.-Tur.

\***Triticum dicoccon** Schrank

Between Adaklı village and Adaklı high plateau, fields, 2400 m, 06 vi 1998, *MÜ* 2849. T.

**Secale montanum** Guss.

Pirreşit Mountain, south-west slopes, steppe, 2200 m, 11 vii 1998, *MÜ* 4501. Hk.

**S. anatolicum** Boiss.

Pirreşit Mountain, north slopes, alpine steppe, 3000 m, 27 vi 1997, *MÜ* 1943. Hk.

**Psathyrostachys fragilis** (Boiss.) Nevski subsp. **secaliniformis** Tzvelev

Between Beşparmak village and Köseveli Hill, steppe, 2400 m, 17 vii 1997, *MÜ* 1732. Kr. Ir.-Tur.

**Hordeum violaceum** Boiss. & É.Huet

Between Adaklı village and Sultan Lake, meadow, 1800-2500 m, 11 vii 1997, *MÜ* 1528. Kh. Ir.-Tur.

**H. geniculatum** All.

Between Beşparmak and Çakmak villages, meadow, 2600 m, 02 vii 1998, *MÜ* 4307. T. Euro-Sib.

**H. bulbosum** L.

Pirreşit Mountain, north-west slopes, steppe, 2200-2600 m, 11 vii 1998, *MÜ* 1578. Kr.

**Taeniatherum caput-medusae** (L.) Nevski subsp. **cirinitum** (Schreb.) Melderis

Around Karaoğlan district, steppe, 1800m, 07 vi 1997, *MÜ* 1242, T. Ir.-Tur.

**Henrardia persica** (Boiss.) C.E.Hubb. var. **glaberrima** (Hausskn. ex Bornm.) C.E.Hubb.

Around Adaklı village, steppe, 2400 m, 06 vi 1998, *MÜ* 2841. T. Ir.-Tur.

**Bromus commutatus** Schrad.

Around Karaoğlan district, steppe, 1800 m, 07 vi 1997, *MÜ* 1269. T.

**B. intermedius** Guss.

Around Adaklı village, steppe, 2500 m, 20 vi 1998, *MÜ* 2955. T.

**B. japonicus** Thunb. subsp. **japonicus**

Around Adaklı village, steppe, 2400 m, 06 vi 1998, *MÜ* 2852. T.

**B. japonicus** Thunb. subsp. **anatolicus** (Boiss. & Heldr.) Pénzes

Pirreşit Mountain, near summit, alpine steppe, 3000 m, 27 vi 1997, *MÜ* 1437a. T.

**B. scoparius** L.

Around Karaoğlan district, steppe, 1800 m, 07 vi 1997, *MÜ* 1268. T.

**B. danthoniae** Trin.

Between Beşparmak village and Köseveli Hill, meadow, 2400 m, 17 vii 1997, *MÜ* 1799. T.

**B. tectorum** L. subsp. **tectorum**

Around Karaoğlan district, steppe, 1800 m, 07 vi 1997, *MÜ* 1243. T.

**B. tomentellus** Boiss.

Around Muradiye Waterfall, steppe, 1726-1800 m, 17 v 1997, *MÜ* 1153. Kr. Ir.-Tur.

**B. variegatus** M.Bieb. subsp. **variegatus**

Pirreşit Mountain, near summit, alpine steppe, 3000 m, 27 vi 1997, *MÜ* 1433. Hk. Ir.-Tur.

**B. erectus** Huds.

Between Beşparmak village and Köseveli Hill, steppe, 2400 m, 17 vii 1997, *MÜ* 1760. Hk.

**Helictotrichon pratense** (L.) Besser ex Schult. & Schult.f.

Between Beşparmak village and Köseveli Hill, meadow, 2400 m, 17 vii 1997, *MÜ* 1739. Hk. Euro-Sib.

**Trisetum flavescens** (L.) P.Beauv.

Pirreşit Mountain, south-west slopes, steppe, 2200 m, 11 vii 1998, *MÜ* 4470. Hk. Euro-Sib.

**T. thospiticum** Chrték

Around Adaklı village, steppe, 2300 m, 22 vii 1998, *MÜ* 4516. Hk. En.-VU. Ir.-Tur.

**Koeleria eriostachya** Pančić

Pirreşit Mountain, near summit, alpine steppe, 3000 m, 27 vi 1997, *MÜ* 1435. Hk.

**K. cristata** (L.) Pers.

Pirreşit Mountain, north-west slopes, steppe, 2200-2600 m, 11 vii 1998, *MÜ* 1576. Hk.

**Deschampsia caespitosa** (L.) P.Beauv.

Between Adaklı village and Sultan Lake, meadow, 1800-2500 m, 11 vii 1997, *Behçet* 5749. Kh.

**Calamagrostis epigejos** (L.) Roth

Around Muradiye Waterfall, stream side, 1800 m, 29 vi 1997, *MÜ* 1463. Kr. Euro-Sib.

*C. pseudophragmites* (Haller f.) Koeler  
Pirreşit Mountain, south-west slopes,  
stream side, 2000 m, 30 vi 1998, *MÜ* 3370.  
Kr. Euro-Sib.

*Agrostis olympica* (Boiss.) Bor  
Pirreşit Mountain, south-west slopes,  
stream side, 2000 m, 28 vi 1998, *MÜ* 4072.  
Hk. Euro-Sib. (mt.).

*A. canina* L.  
Pirreşit Mountain, south-west slopes,  
stream side, 2200 m, 11 vii 1998, *MÜ* 4495.  
Hk. Euro-Sib.

*A. planifolia* C.Koch.  
Pirreşit Mountain, south-west slopes,  
stream side, 2000 m, 30 vi 1998, *MÜ* 3879.  
Hk. Ir.-Tur.

*Zingeria pisidica* (Boiss.) Tutin  
Between Muradiye town and Yumaklı  
village, steppe, 1716 m, 06 x 1998, *MÜ*  
3822. T. Ir.-Tur.

*Z. biebersteiniana* (Claus) P.A.Smirn.  
subsp. *trichopoda* (Boiss.) R.R.Mill.

Pirreşit Mountain, near summit, alpine  
steppe, 3000 m, 30 vi 1998, *MÜ* 3082. T.  
Ir.-Tur.

*Phalaris arundinacea* L.  
Between Beşparmak and Çakmak  
villages, meadow, 2600 m, 02 vii 1998, *MÜ*  
4256. Hk.

*Alopecurus aequalis* Sobol.  
Between Adaklı village and Sultan Lake,  
meadow, 1800-2500 m, 11 vii 1997, *Behçet*  
5739. Kr. Euro-Sib.

*A. arundinaceus* Poir.  
Around Topuzarpa villege, meadow,  
1740-1900 m, 24 v 1997, *MÜ* 1168. Hk.  
Euro-Sib.

*A. textilis* Boiss. subsp. *tiflisiensis*  
(G.Westb.) Tzvelev  
Pirreşit Mountain, south-west slopes,  
rocky areas, 2000 m, 30 vi 1998, *MÜ* 3666.  
Kr. Ir.-Tur.

*A. textilis* Boiss. subsp. *textilis*  
Pirreşit Mountain, south slopes, steppe,  
2400 m, 08 vi 1997, *MÜ* 1367. Kr. Ir.-Tur.

*A. aucheri* Boiss.

Around Beşparmak village, meadow,  
2300-2450 m, 17 vii 1997, *MÜ* 1674. Hk.  
Ir.-Tur.

*Phleum alpinum* L.

Between Adaklı village and Adaklı high  
plateau, steppe, 2400 m, 06 vi 1998, *MÜ*  
2557. Kr. Euro-Sib.

*P. montanum* C.Koch subsp.  
*montanum*

Between Beşparmak and Çakmak  
villages, steppe, 2600 m, 02 vii 1998, *MÜ*  
4318. Kh.

*P. phleoides* (L.) H.Karst.

Between Beşparmak and Çakmak  
villages, steppe, 2600 m, 02 vii 1998, *MÜ*  
4289. Hk. Euro-Sib.

*Festuca gigantea* (L.) Vill.

Around Adaklı village, stream side, 2400  
m, 22 vii 1998, *MÜ* 4522. Kh. Euro-Sib.

*F. anatolica* Markgr.-Dann. subsp.  
*anatolica*

Pirreşit Mountain, south-west slopes,  
steppe, 2000 m, 30 vi 1998, *MÜ* 3749. Kh.  
En.-LC.

*F. woronowii* Hackel subsp. *caucasica*  
(St.-Yves) Markgr.-Dann.

Around Adaklı village, steppe, 2400 m,  
06 vi 1998, *MÜ* 2583. Hk. Ir.-Tur.

*F. brunnescens* (Tzvelev) Galushko

Pirreşit Mountain, north slopes, alpine  
steppe, 3000 m, 27 vi 1997, *MÜ* 1936. Kh.  
Ir.-Tur.

*F. oreophila* Markgr.-Dann.

Pirreşit Mountain, south-west slopes,  
steppe, 2000 m, 30 vi 1998, *MÜ* 3504. Hk.  
Ir.-Tur.

*Vulpia fasciculata* (Forssk.) Fritsch

Pirreşit Mountain, south slopes, steppe,  
2400 m, 08 vi 1997, *MÜ* 1253. T. Medit.

*Poa trivialis* L.

Around Sultan Lake, steppe, 2600 m, 11  
vii 1998, *MÜ* 1531. Kh.

*P. pratensis* L.

Pirreşit Mountain, south-west slopes,  
steppe, 2200 m, 11 vii 1998, *MÜ* 4482. Kr.

*P. angustifolia* L.

Around Karaoğlan district, meadow,  
1800 m, 07 vi 1997, *MÜ* 1262. Hk.

*P. longifolia* Trin.

Pirreşit Mountain, south-west slopes,  
steppe, 2000 m, 30 vi 1998, *MÜ* 3615. Hk.  
Eux.

▲*P. diversifolia* (Boiss. & Ball) Hackel ex  
Boiss.

Around Adaklı village, meadow, 2400 m,  
06 vi 1998, *MÜ* 2863. Hk. E.Medit. (mt.).

*P. nemoralis* L.

Around Adaklı village, stream sides, 2300  
m, 22 vii 1998, *MÜ* 4539. Kh.

*P. sterilis* M.Bieb.

Around Adaklı village, meadow, 2400 m,  
06 vi 1998, *MÜ* 2537. Hk.

*P. araratica* Trautv.

Pirreşit Mountain, south-west slopes,  
steppe, 2000 m, 30 vi 1998, *MÜ* 3753. Hk.  
Ir.-Tur.

*P. alpina* L. subsp. *fallax* F.Herm.

Pirreşit Mountain, south-west slopes,  
steppe, 2000 m, 30 vi 1998, *MÜ* 3688. Kh.

*P. bulbosa* L.

Between Adaklı village and Sultan Lake,  
steppe, 1800-2500 m, 11 vii 1997, *MÜ*  
1590. Kh.

*Eremopoa songarica* (Schrenk) Roshev.

Pirreşit Mountain, near summit, alpine  
steppe, 3000 m, 28 vi 1998, *MÜ* 3175. T.  
Ir.-Tur.

*Catabrosella araratica* (Lipsky) Tzvelev

Between Beşparmak and Çakmak  
villages, alpine steppe, 2600 m, 02 vii 1998,  
*MÜ* 4380. Hk. Ir.-Tur. (mt.).

*C. parviflora* (Boiss. & Buhse) Alexeev ex  
R.R.Mill subsp. *parviflora*

Around Topuzarpa village, steppe, 1740-  
1900 m, 24 v 1997, *MÜ* 1177. Hk. Ir.-Tur.

*Catabrosa aquatica* (L.) P.Beauv.

Pirreşit Mountain, south-west slopes,  
stream side, 2000 m, 30 vi 1998, *MÜ* 3303.  
Hk.

*Dactylis glomerata* L. subsp. *glomerata*

Around Adaklı village, steppe, 2500 m,  
20 vi 1998, *MÜ* 2999. Hk. Euro-Sib.

*D. glomerata* L. subsp. *hispanica* (Roth)  
Nyman

Between Muradiye town and Yakıncak village, field edges, 1800 m, 06 x 1997, *MÜ* 2023. Hk.

*Sesleria phleoides* Steven ex Roem. & Schult.

Pirreşit Mountain, near summit, alpine steppe, 3000 m, 27 vi 1997, *MÜ* 1430. Hk.

*Melica ciliata* L. subsp. *ciliata*

Pirreşit Mountain, north slopes, rocky areas, 3000 m, 27 vi 1997, *MÜ* 1941. Hk.

*M. persica* Kunth subsp. *persica*

Pirreşit Mountain, near summit, rocky areas, 3000 m, 30 vi 1998, *MÜ* 3165. Kr.

*M. persica* Kunth subsp. *jacquemontii* (Decne. ex Jacquem.) P.H.Davis

Köseveli Hill, north slopes, meadow, 2300 m, 17 vii 1997, *MÜ* 1702. Kr. Ir.-Tur.

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

Around Sultan Lake, steppe, 2600 m, 11 vii 1998, *MÜ* 1527. Kr.

*Glyceria plicata* (Fr.) Fr.

Pirreşit Mountain, south slope, meadow, 11 vii 1998, *MÜ* 4490. Hk.

*Nardus stricta* L.

Between Beşparmak and Çakmak villages, alpine meadow, 2600 m, 02 vii 1998, *MÜ* 4343. Hk. Euro-Sib.

*Stipa holosericea* Trin.

Pirreşit Mountain, south-west slopes, steppe, 2200 m, 11 vii 1998, *MÜ* 1579. Hk. Ir.-Tur.

*S. arabica* Trin. & Rupr.

Between Beşparmak and Çakmak villages, steppe, 2600 m, 02 vii 1998, *MÜ* 4258. Hk. Ir.-Tur.

*S. ehrenbergiana* Trin. & Rupr.

Pirreşit Mountain, north slopes, alpine steppe, 3000 m, 27 vi 1997, *MÜ* 1944. Hk. Ir.-Tur.

*S. pontica* P.A.Smirn.

Pirreşit Mountain, south-west slopes, steppe, 2000 m, 30 vi 1998, *MÜ* 3736. Hk.

*S. pulcherrima* C.Koch subsp. *crassiculmis* (P.A.Smirn.) Tzvelev

Around Sultan Lake, steppe, 2600 m, 11 vii 1998, *MÜ* 1533. Kh.

*Piptatherum holciforme* (M.Bieb.) Roem. & Schult. subsp. *holciforme* var. *holciforme*

Between Muradiye town and Yumaklı village, steppe, 1716 m, 06 x 1998, *MÜ* 3098. Kh.

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

Between Muradiye town and Yumaklı village, stream side, 1716 m, 06 x 1997, *MÜ* 2079. Kr. Euro-Sib.

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

Around Yumaklı valley, stream sides, 2200 m, 19 x 1997, *MÜ* 2222. T.