

The Flora of Ahırdağı (Afyonkarahisar) and its Environs

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Abstract: The flora of Ahırdağı was investigated between 1996 and 2000. In the vegetation periods, a total of 965 plant specimens were collected. At the end of the study 603 taxa at species and subspecies ranks belonging to 299 genera and 80 families had been determined. Seventy-nine taxa are endemic, and the ratio is 13.10%. The phytogeographical spectra of the species are as follows: Mediterranean 13.10%, Irano-Turanian 11.61%, Euro-Siberian 11.61% and phytogeographically unknown 63.68%. Threatened categories were proposed for the 79 endemic taxa according to IUCN categories.

Key Words: Flora, Ahırdağı, Afyon, Turkey

Ahırdağı (Afyonkarahisar) ve Çevresinin Florası

Özet: Ahırdağı'nın florası 1996-2000 yılları arasında araştırıldı. Araştırma alanından 965 bitki örneği toplandı. Bu çalışmanın sonunda araştırma alanında 80 familyaya ait 299 cins ve 603 tür ve türaltı takson tespit edildi. Bu taksonların 79'u Türkiye için endemik olup endemizm oranı % 13.10'dur. Türlerin fitocoğrafik bölgelere göre dağılımı şöyledir: Akdeniz % 13.10, İran-Turan % 11.61, Avrupa-Sibirya % 11.61 ve fitocoğrafik olarak bilinmeyenler ise % 63.68'dir. IUCN tehlike kategorilerine göre 79 endemik taksonun tehlike durumu değerlendirilmiştir.

Anahtar Sözcükler: Flora, Ahırdağı, Afyon, Türkiye

Introduction

Ahırdağı is located in the south-west of Afyonkarahisar province, and borders on the Sincanlı and Hocalar districts. It is also a point on the intersection zone of the Mediterranean, Irano-Turanian and Euro-Siberian phytogeographic regions.

According to the grid square system, the southern part of Hocalar is located in the square B2 and the other part in B3. The lowest altitude is 800 m around Hocalar. Its highest point is 2000 m, at Ahırdağı (Figure 1). The region chosen as the study area has an intersectional feature. The study area has an interesting feature in that its plant diversity consists of plants of the three phytogeographic regions. For example, although *Pinus brutia* Ten. is a Mediterranean element, it is found around Hocalar town; *Tilia rubra* DC. subsp. *caucasica* (Rupr.) V. Engl., a Euro-Siberian element, is found on the northern slopes of Fındıklı hill in the form of natural communities. Widely extended forests formed by *Pinus nigra* Arn. subsp. *nigra* var. *caramanica* (Loudon) Rehder

trees, well-built and 30-35 m tall, are found around Çataloluk and Karapınar, and south of Yağcı, Yürükmezari and Çobanözü villages. Around Tazlar village, a community of monumental trees, *P. nigra* subsp. *nigra* var. *caramanica*, can be seen in picnic areas. In the places where *P. nigra* subsp. *nigra* var. *caramanica* has been damaged by biotic factors., *Quercus cerris* L. var. *cerris* and *Cistus laurifolius* L. community formations were found. The other parts of the region display steppe-forest intersectional features. The literature showed that these had never been studied before. That is why Ahırdağı and its environs were chosen as the study area. This research was also intended to contribute to the flora of Afyon and Turkey in order to determine the plant diversity of the study area.

The climatic data for the area were obtained from the Afyon meteorological station (State Meteorological Institute, 2000). A Mediterranean climate is present in the study area and its precipitation regime is of the East Mediterranean Type 2 SWAS (spring, winter, autumn, summer).

Some large families in terms of the number of genera are *Asteraceae* (37), *Fabaceae* (18), *Brassicaceae* (10), *Lamiaceae* (21), *Poaceae* (21) and *Scrophulariaceae* (10). The richest families in terms of the number of taxa (species and subspecies) are *Fabaceae*, 77, (12.62%), *Asteraceae*, 65, (10.79%), *Lamiaceae*, 50, (8.30%), *Brassicaceae*, 34, (5.64%) and *Poaceae*, 33, (5.48%). These families contain 259 (42.85%) taxa. These families were also compared with those reported in studies carried out near to our study area (Gemici, 1988; Ekim et al., 1985; Çirpıcı, 1989; Vural & Çetik, 1976; Aytaç & Vural, 1990; Ocakverdi, 1982). The families *Asteraceae*, *Fabaceae*, *Lamiaceae*, *Brassicaceae* and *Poaceae* comprise the most taxa in Ahırdağı, Akdağ, Maymun Dağları and Simav Dağı, as seen in Table 1. The other study areas show similar features to our study area although there

are some minor differences. For example, in the first order, *Caryophyllaceae* replace *Brassicaceae* in Kocatepe and Sultandağları, *Poaceae* in Murat Dağı and *Lamiaceae* in Köroğlu Beli.

The richest genera in terms of number of taxa are *Astragalus* L. (16), *Verbascum* L. (8), *Trifolium* L. (12), *Veronica* L. (8), *Ranunculus* L. (11), *Silene* L. (8), *Alyssum* L. (7), *Centaurea* L. (8), *Galium* L. (8), *Potentilla* L. (5) and *Minuartia* L. (6).

According to Table 2, the richest genus is not absolute and clear on the family level. In the most studies carried out in Turkey, *Astragalus* is shown as the richest genus, but in some studies *Centaurea* and *Silene* are in first place.

Table 1. Species totals of the major families from eight floristic studies carried out close to our study area.

Families	Ahırdağı (Afyon)	Kocatepe Milli Parkı (Afyon)	Akdağ (Sandıklı)	Murat Dağı (Kütahya)	Köroğlu Beli (Bayat)	Sultandağ. Doğanhisar	Maymun Dağları	Simav D. (Kütahya)
Number of species	603	667	1060	890	310	461	481	502
<i>Asteraceae</i>	65	89	137	113	39	55	81	55
<i>Fabaceae</i>	77	81	103	65	30	48	41	68
<i>Lamiaceae</i>	50	45	61	52	20	35	41	31
<i>Brassicaceae</i>	34	29	67	60	24	21	26	30
<i>Poaceae</i>	33	47	57	31	33	45	20	30
<i>Caryophyllaceae</i>	31	41	53	55	23	27	12	25
<i>Scrophulariaceae</i>	28	38	53	42	16	18	17	22
<i>Rosaceae</i>	21	30	38	42	12	14	14	15
<i>Apiaceae</i>	19	26	44	34	10	17	17	13
<i>Boraginaceae</i>	18	20	24	27	9	11	17	25

Table 2. Species totals of the large genera from eight floristic studies.

Families	Ahırdağı (Afyon)	Kocatepe Milli Parkı (Afyon)	Akdağ (Sandıklı)	Murat Dağı (Kütahya)	Köroğlu Beli (Bayat)	Sultandağ. Doğanhisar	Maymun Dağları	Simav D. (Kütahya)
<i>Astragalus</i>	16	21	18	11	4	10	12	6
<i>Trifolium</i>	12	15	22	8	9	1	12	14
<i>Verbascum</i>	8	12	10	4	5	5	9	1
<i>Veronica</i>	8	11	15	6	7	4	14	10
<i>Ranunculus</i>	11	11	16	5	5	5	14	10
<i>Silene</i>	8	11	13	10	10	4	15	8
<i>Alyssum</i>	7	8	10	7	5	2	12	9
<i>Centaurea</i>	8	8	15	9	6	9	17	6
<i>Galium</i>	8	7	8	9	6	4	8	4
<i>Potentilla</i>	5	7	8	1	1	2	6	4
<i>Minuartia</i>	6	6	9	3	2	-	5	3

Differences in listings of both family and genus are closely related to the collection areas such as steppe, forest and areas cultivated by grazing, mentioned by Ekim et al. (1985). However, the difference between Table 1 and 2 could be explained by the aims of the studies. In phytosociologic studies in particular, researchers attach importance to collecting those species which help their studies achieve their aims. For this reason, some researchers are very careful when collecting specimens, leading to the changes in their lists (Ekim et al, 1985).

Mediterranean taxa are the dominant group in the research area. Mediterranean elements comprise some 13.10% (79) of the total taxa determined. Irano-Turanian taxa constitute 11.61% (70), 11.61% (70) of the taxa belong to the Euro-Siberian phytogeographic region and 63.68% of the taxa are phytogeographically unknown. When the results were compared, it was apparent that these rates were quite similar to those of other studies. This can be explained by the fact that the

study area is a transition zone between different phytogeographical regions (Table 3). There are some differences between our study and other studies carried out near the study area. Our results are similar to those of Ekim et al. (1985) in respect of floristic composition.

The number of endemic taxa in the study area is 79 and the endemism rate is 13.10%. Twenty-eight (35.44 %) of these taxa belong to the Irano-Turanian phytogeographic region. Nineteen (24.05%) of these taxa belong to the Mediterranean and two (2.53%) to the Euro-Siberian (Euxine) phytogeographical regions. The number of phytogeographically unknown endemics is 30 (37.97%).

Seventy-nine endemic taxa were evaluated according to IUCN risk categories. The results are summarised in Table 4. Fifty-four taxa are placed in the least concern categories, while four are placed in the vulnerable category, three in the endangered, six in the conservation dependent and 12 in the near threatened.

Table 3. The phytogeographical regions compared to those of similar studies.

Families	Ahırdağı (Afyon)	Kocatepe Milli Parkı (Afyon)	Sultandağ Doğanhisar	Akdağ (Sandıklı)	Maymun Dağları	Murat Dağı (Kütahya)	Simav D. (Kütahya)
Taxa	602	667	461	1060	481	890	502
Mediterranean element	13.10%	10.94%	12.50%	18.48%	45.30%	10.48%	16.53%
Irano-Turanian element	11.61%	8.39%	13.00%	10.75%	16.00%	9.57%	4.98%
Euro-Siberian element	11.61%	9.14%	5.70%	8.39%	3.60%	11.30%	7.77%
Phytogeographically Unknown	63.68%	71.53%	74.44%	62.38%	35.10%	68.65%	70.72%

Table 4. Risk categories of endangered endemic taxa.

Categories	LR (lc)	LR (nt)	LR (cd)	VU	EN	Total
Taxa	54	12	6	4	3	79

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Appendix

This is the list of vascular plant species found on Ahırdaęı. The sequence of families, genera and species in the following list follows the system adopted in the Flora of Turkey. Abbreviations used in the appendix are as follows:

E. Medit.: East Mediterranean

Ir.-Tur.: Irano-Turanian

Euro-Sib.: Euro-Siberian

LR (lc): Least concern

LR (cd): Conservation dependent

LR (nt): Near threatened

VU: Vulnerable

EN: Endangered

*: An asterisk indicates cultivated plants.

PTERIDOPHYTA

EQUISETACEAE

Equisetum ramosissimum Desf.

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, wet meadows, 1450 m, 21 vi 1996, Kargioęlu 2115.

E. palustre L.

B3 Afyon: Hocalar, Yaęcı village, Karagöl district, damp places, 1500 m, 13 vi 1998, Kargioęlu 2545.

E. arvense L.

B3 Afyon: Hocalar, Yaęcı village, Karagöl district, streamsides, 1500 m, 13 vi 1998, Kargioęlu 2544.

ATHYRIACEAE

Cystopteris fragilis (L.) Bernh.

B3 Afyon: Sincanlı, Ahırdaęı, Büyükkavuşak hill, rocky places, 1900 m, 28 vi 1997, Kargioęlu 2417.

ASPIDIACEAE

Dryopteris filix-mas (L.) Schott

B3 Afyon: Sincanlı, Tazlar village, Yellice hill, rocky places, 1500 m, 28 vi 1997, Kargioęlu 2415.

D. affinis (Lowe) Fraser-Jenk. subsp. *borreri* (Newman) Fraser-Jenk.

B3 Afyon: Sincanlı, Ahırdaęı, Büyükkavuşak hill, rocky places, 1900 m, 31 v 1997, Kargioęlu 2349.

D. pallida (Bory) Fomin subsp. *pallida*

B3 Afyon: Sincanlı, Tazlar village, Yellice hill, rocky places, 1500 m, 01 vi 1997, Kargioęlu 2364.

SPERMATOPHYTA

GYMNOSPERMAE

PINACEAE

Cedrus libani A.Rich.

B3 Afyon: Sincanlı, Yürükmezarı village, Karapınar district, plantation, 1650 m, 11 ix 1999, Kargioęlu 2788. Medit. (mt.) element.

Pinus sylvestris L. var. *hamata* Steven

B3 Afyon: Sincanlı, Yürükmezarı village, Karapınar district, plantation, 1650 m, 11 ix 1999, Kargioęlu 2789. Euro-Sib. element.

P. nigra Arn. subsp. *nigra* var. *caramanica* (Loudon) Rehder

B3 Afyon: Sincanlı, Ahırdaęı, Asar hill, 1450 m, 12 vi 1996, Kargioęlu 2078.

P. brutia Ten.

B2 Afyon: Around Hocalar, south slopes, 900 m, 14 vi 1998, Kargioęlu 2638.

E. Medit. element.

CUPRESSACEAE

Juniperus oxycedrus L. subsp. *oxycedrus*

B3 Afyon: Sincanlı, around Tazlar village, clearings of *Pinus nigra* forest, 1400 m, 27 viii 2000, Kargioęlu 2800.

J. foetidissima Willd.

B3 Afyon: Sincanlı, around Çayhisar village, clearings of *Quercus cerris* forest, 1380 m, 16 vii 1998, Kargioęlu 2776.

J. excelsa M.Bieb.

B3 Afyon: Sincanlı, Ahırdaęı, Ardıçlı hill, rocky places, 1650 m, 28 vi 1997, Kargioęlu 2418.

ANGIOSPERMAE

RANUNCULACEAE

Eranthis hyemalis (L.) Salisb.

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, clear places, 1500 m, 09 iii 1997, Kargioęlu 2313.

Nigella arvensis L. var. *glauca* Boiss.

B3 Afyon: Hocalar, Yaęcı village, clearings of *Cistus laurifolius* shrubs, 1300 m, 05 vii 1996, Kargioęlu 2201.

Delphinium fissum Waldst. & Kit. subsp. *anatolicum* Chowdhuri & P.H.Davis

B3 Afyon: Hocalar, north-east of Yaęcı village, Ortadere district, clearings of *Cistus laurifolius* shrubs, 1300 m, 28 vi 1988, Kargioęlu 2667. Endemic. "LR (lc)"

Consolida regalis Gray subsp. *paniculata* (Host) Soo var. *paniculata*

B3 Afyon: Sincanlı, Çayhisar village, roadsides, 1100 m, 26 vii 1996, Kargioğlu 2280.

Adonis flammea Jacq.

B3 Afyon: Sincanlı, field and roadsides, 1150 m, 08 v 1996, Kargioğlu 2022.

Ranunculus brutius Ten.

B3 Afyon: Hocalar, Yağcı village, around Karagöl, clearings of *Pinus nigra* forest, 1400 m, 13 vi 1998, Kargioğlu 2553. Euro-Sib. element.

R. neapolitanus Ten.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya streamsides, 1400 m, 03 vii 1996, Kargioğlu 2147.

R. repens L.

B3 Afyon: Hocalar, Yağcı village, around Karagöl, clearings of *Pinus nigra* forest, wet places, 1500 m, 13 vi 1998, Kargioğlu 2547.

R. polyanthemus L.

B3 Afyon: Sincanlı, Çayhisar village, around spring, wet places, 1100 m, 26 vii 1996, Kargioğlu 2248.

R. constantinopolitanus (DC.) d' Urv.

B3 Afyon: Sincanlı, around Tazlar village, damp meadows, 1500 m, 01 vi 1997, Kargioğlu 2383.

R. argyreus Boiss.

B3 Afyon: Hocalar, Yağcı village, around Karagöl, clearings of *Pinus nigra* forest, 1500 m, 25 v 1996, Kargioğlu 2052.

R. reuterianus Boiss.

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, stony slopes, 1800 m, 14 iv 1996, Kargioğlu 2000. Endemic. "LR (lc)"

R. heterorhizus Boiss. & Bal.

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, clearings of *Pinus nigra* forest, 1550 m, 03 vii 1996, Kargioğlu 2186. Endemic. "LR (cd)"

R. arvensis L.

B3 Afyon: Sincanlı, Yürükmezarı village, fields, 1450 m, 21 vi 1996, Kargioğlu 2114.

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

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, field margins, wet places, 1550 m, 09 iii 1997, Kargioğlu 2316.

R. saniculifolius Viv.

B3 Afyon: Hocalar, Yağcı village, Karagöl, 1350 m, 13 vi 1998, Kargioğlu 2556.

Ceratocephalus falcatus (L.) Pers.

B3 Afyon: Sincanlı, Çayhisar village, clear places, 1150 m, 22 v 1996, Kargioğlu 2027.

C. testiculatus (Crantz) Roth

B3 Afyon: Sincanlı, Çobanözü village, clear places, 1300 m, 25 v 1996, Kargioğlu 2039.

PAEONIACEAE

Paeonia mascula (L.) Mill. subsp. *mascula*

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, rocky slopes, 1900 m, 28 vi 1997, Kargioğlu 2431.

PAPAVERACEAE

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

B3 Afyon: Hocalar, Yağcı village, fields, 1500 m, 31 v 1998, Kargioğlu 2527.

**Papaver somniferum* L.

B3 Afyon: Sincanlı, Çobanözü village, cultivated, 1200 m, 27 viii 2000, Kargioğlu 2813.

P. dubium L.

B3 Afyon: Sincanlı, field and roadsides, 1200 m, 13 vi 1998, Kargioğlu 2601.

P. argemone L.

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2637.

Corydalis solida (L.) Sw. subsp. *solida*

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, slopes, 1550 m, 16 iv 1997, Kargioğlu 2324.

Fumaria asepsala Boiss.

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia*, 900 m, 14 vi 1998, Kargioğlu 2636.

Ir.-Tur. element.

CRUCIFERAE (BRASSICACEAE)

Raphanus raphanistrum L.

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, field margins, 1500 m, 03 vii 1996, Kargioğlu 2181.

Crambe tataria Sebeök

B3 Afyon: Sincanlı, field and roadsides, 1100 m, 04 vii 1997, Kargioğlu 2339.

Rapistrum rugosum (L.) All.

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, field margins, 1500 m, 03 vii 1996, Kargioğlu 2182.

Conringia perfoliata (C.A.Mey.) E.A.Busch

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2610.

Lepidium sativum L. subsp. *sativum*

B3 Afyon: Sincanlı, Yürükmezarı village, cultivated places, 1450 m, 03 vii 1996, Kargioğlu 2161.

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

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, cultivated places, 1500 m, 03 vii 1996, Kargioğlu 2180.

Isatis glauca Aucher ex Boiss. subsp. *glauca*

B3 Afyon: Sincanlı-Çayhisar road, roadsides, 1100 m, 26 vii 1996, Kargioğlu 2279.

Ir.-Tur. element.

Iberis sempervirens L.

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, steppe, 1600 m, 08 v 1996, Kargioğlu 2015. Medit. element.

Aethionema arabicum (L.) Andr. ex DC.

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2609.

Thlaspi arvense L.

B3 Afyon: Sincanlı, around Yürükmezarı village, clear places, 1400 m, 08 v 1996, Kargioğlu 2009.

Capsella bursa-pastoris (L.) Medik.

B3 Afyon: Sincanlı, Yürükmezarı village, cultivated places, 1450 m, 03 vii 1996, Kargioğlu 2160.

Neslia apiculata Fisch.

B3 Afyon: Sincanlı, roadsides, 1150 m, 22 v 1996, Kargioğlu 2031.

Alyssum huetii Boiss.

B3 Afyon: Sincanlı, cultivated places, 1150 m, 08 v 1996, Kargioğlu 2024.

Endemic, Ir.-Tur. element. "LR (lc)"

A. desertorum Stapf var. *desertorum*

B3 Afyon: Sincanlı, west of Çayırhisar village, rocky places, 1300 m, 04 v 1997, Kargioğlu 2338.

A. minutum Schltld. ex DC.

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 03 vii 1997, Kargioğlu 2190.

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

B3 Afyon: Sincanlı, cultivated places and roadsides, 1150 m, 08 v 1996, Kargioğlu 2025.

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

B2 Afyon: Hocalar, Yağcı village, clearings of *Pinus nigra* forest, 1500 m, 31 v 1998, Kargioğlu 2529.

A. constellatum Boiss.

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1650 m, 22 vii 1997, Kargioğlu 2458.

A. pateri Nyar. subsp. *pateri*

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1750 m, 03 vii 1996, Kargioğlu 2167. Endemic, Ir.-Tur. element. "LR (lc)"

Draba bruniifolia Steven subsp. *bruniifolia*

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, steppe, 1750 m, 25 v 1996, Kargioğlu 2035.

Subsp. *heterocoma* (Fenzl) Coode & Cullen var. *nana* (Stapf) Schulz

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, steppe, 1750 m, 25 v 1996, Kargioğlu 2036. Endemic. "LR (lc)"

D. muralis L.

B3 Afyon: Sincanlı, Yürükmezarı village, Karapınar district, clear places, 1600 m, 01 vi 1997, Kargioğlu 2392.

Erophila verna (L.) Chevall. subsp. *verna*

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1700 m, 31 v 1998, Kargioğlu 2506.

Arabis caucasica Willd. subsp. *caucasica*

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1550 m, 25 v 1996, Kargioğlu 2048.

A. sagittata (Bertol.) DC.

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1450 m, 25 v 1996, Kargioğlu 2060.

A. nova Vill.

B2 Afyon: Hocalar, Yağcı village, around Karagöl, clearings of *Pinus nigra* forest, 1500 m, 31 v 1998, Kargioğlu 2530.

Turritis laxa (Sibth. & Sm.) Hayek

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1500 m, 03 vii 1996, Kargioğlu 2191.

Nasturtium officinale R.Braga

B3 Afyon: Sincanlı-Yürükmezarı village road, around spring, 1200 m, 28 vi 1997, Kargioğlu 2412.

Barbarea verna (Mill.) Asch.

B3 Afyon: Sincanlı, Yürükmezarı village, Karapınar district, wet places, 1650 m, 22 vi 1996, Kargioğlu 2128.

Aubrieta pinardii Boiss.

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, rocky places, 1900 m, 28 vi 1997, Kargioğlu 2421. Ir.-Tur. element.

Malcolmia africana (L.) R.Braga

B3 Afyon: Hocalar, Yağcı village, waste places, 1200 m, 31 v 1997, Kargioğlu 2356.

Erysimum cuspidatum (M.Bieb.) DC.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya stream banks, damp meadows, 1450 m, 12 vi 1996, Kargioğlu 2063.

Sisymbrium altissimum L.

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, field margins, 1500 m, 03 vii 1996, Kargioğlu 2183.

Camelina rumelica Velen.

B3 Afyon: Sincanlı, south-east of Tazlar, cultivated places, 1500 m, 01 vi 1997, Kargioğlu 2368.

RESEDACEAE

Reseda lutea L. var. *lutea*

B3 Afyon: Sincanlı, Çayhisar village, field and roadsides, 1200 m, 10 vii 1996, Kargioğlu 2228.

CISTACEAE

Cistus laurifolius L.

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2614. Medit. element.

Helianthemum salicifolium (L.) Mill.

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2616.

Fumana procumbens (Dunal) Gren. & Godr.

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2615.

VIOLACEAE

Viola odorata L.

B3 Afyon: Hocalar, Yağcı village, Çavdarlı district, stream bed, 1500 m, 25 v 1996, Kargioğlu 2058.

V. sieheana W.Becker

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, rocky places, 1800 m, 14 vi 1998, Kargioğlu 2649.

V. occulta Lehm.

B3 Afyon: Sincanlı, Çayırhisar village, cultivated land, 1300 m, 04 v 1997, Kargioğlu 2342.

V. parvula Tineo

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, steppe, 1800 m, 14 iv 1996, Kargioğlu 2001.

V. kitaibeliana Roem. & Schult.

B3 Afyon: Sincanlı, Güvercinlik hill, stony slopes, 1750 m, 31 v 1997, Kargioğlu 2348.

POLYGALACEAE

Polygala supina Schreb.

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2639.

P. pruinosa Boiss. subsp. *pruinosa*

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1650 m, 16 vii 1998, Kargioğlu 2770.

CARYOPHYLLACEAE

Arenaria serpyllifolia L.

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1650 m, 31 v 1998, Kargioğlu 2507.

A. acerosa Boiss.

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1750 m, 03 vii 1996, Kargioğlu 2170. Endemic. "LR (lc)"

Minuartia juniperina (L.) Maire & Petitm.

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, rocky slopes, 1900 m, 28 vi 1997, Kargioğlu 2424.

M. hamata (Hausskn.) Mattf.

B3 Afyon: Hocalar, Yağcı village, clearings of *Pinus nigra* forest, 1550 m, 31 v 1997, Kargioğlu 2352.

M. anatolica (Boiss.) Woronow var. *phrygia* (Bornm.) McNeill

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, stony and rocky places, 1800 m, 16 vii 1998, Kargioğlu 2728.

Endemic, Ir.-Tur. element. "VU"

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

B3 Afyon: Sincanlı, Tazlar village, Yellice hill, stony places, 1500 m, 01 vi 1997, Kargioğlu 2372.

M. leucocephaloides (Bornm.) Bornm.

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, stony places, 1650 m, 22 vii 1997, Kargioğlu 2460. Endemic. "LR (lc)"

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

B3 Afyon: Hocalar, west of Yağcı village, clearings of *Cistus laurifolius* shrubs, 1200 m, 13 vi 1998, Kargioğlu 2568.

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

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1650 m, 16 vii 1998, Kargioğlu 2756.

Cerastium anomalum Waldst. & Kit.

B2 Afyon: Hocalar, around Yağcı village, meadows, 1500 m, 31 vi 1998, Kargioğlu 2532.

C. dichotomum L. subsp. *dichotomum*

B3 Afyon: Sincanlı, south-east of Tazlar village, cultivated ground, 1500 m, 01 vi 1997, Kargioğlu 2369.

C. brachypetalum Pers. subsp. *roeseri* (Boiss. & Heldr.) Nyman

B3 Afyon: Hocalar, Yağcı village, around Karagöl, clearings of *Pinus nigra* forest, 1500 m, 31 v 1998, Kargioğlu 2533.

C. fragillimum Boiss.

B3 Afyon: Hocalar, Yağcı village, clearings of *Pinus nigra* forest, 1550 m, 31 v 1997, Kargioğlu 2351.

C. gracile Dufur.

B3 Afyon: Sincanlı, Ahırdağı, rocky slopes, 1750 m, 31 v 1998, Kargioğlu 2519.

Holosteum umbellatum L. var. *umbellatum*

B3 Afyon: Sincanlı, fields and roadsides, 1150 m, 08 v 1996, Kargioğlu 2017.

Moenchia mantica (L.) Bartl. subsp. *mantica*

B3 Afyon: Sincanlı, Kırka town, Hisar hill, clearings of *Cistus laurifolius* shrubs, 1380 m, 28 vi 1998, Kargioğlu 2671.

Subsp. *caerulea* (Boiss.) A.R.Clapham

B3 Afyon: Sincanlı, south-east of Tazlar village, clear places, 1500 m, 01 vi 1997, Kargioğlu 2373.

Dianthus zonatus Fenzl var. *zonatus*

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1650 m, 26 vii 1996, Kargioğlu 2266.

D. lydus Boiss.

B3 Afyon: Sincanlı, Kinik village, Karata? hill, clearings of *Quercus cerris* forest, 1310 m, 14 vii 1998, Kargioğlu 2684. Endemic. "LR (lc)"

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

B3 Afyon: Sincanlı, Kinik village, Karata? hill, clearings of *Quercus cerris* forest, 1310 m, 14 vii 1998, Kargioğlu 2685.

Velezia rigida L.

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2613.

Saponaria glutinosa M.Bieb.

B3 Afyon: Sincanlı, Kırka town, Hisar hill, clearings of *Cistus laurifolius* shrubs, 1380 m, 28 vi 1998, Kargioğlu 2673.

Silene italica (L.) Pers.

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1450 m, 12 vi 1996, Kargioğlu 2076.

S. supina M.Bieb. subsp. *pruinosa* (Boiss.) Chowdhuri

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, field and roadsides, 1550 m, 10 vii 1996, Kargioğlu 2220.

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

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya stream banks, 1500 m, 21 vi 1996, Kargioğlu 2089.

S. rhynchocarpa Boiss.

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, rocky slopes, 1900 m, 28 vi 1997, Kargioğlu 2425.

S. compacta Fisch.

B3 Afyon: Sincanlı, Yürükmezarı village, Karapınar district, clearings of *Pinus nigra-Cistus laurifolius* community, 1600 m, 10 vii 1996, Kargioğlu 2233.

S. subconica Friv.

B3 Afyon: Sincanlı, fields and roadsides, 1150 m, 08 v 1996, Kargioğlu 2019.

S. lydia Boiss.

B3 Afyon: Sincanlı, roadsides, 1150 m, 22 v 1996, Kargioğlu 2029.

E. Medit. element.

S. conoidea L.

B3 Afyon: Sincanlı, field and roadsides, 1200 m, 13 vi 1998, Kargioğlu 2596.

Agrostemma githago L.

B3 Afyon: Hocalar, around Yağcı village, fields, 1200 m, 13 vi 1998, Kargioğlu 2603.

ILLECEBRACEAE

Herniaria incana Lam.

B3 Afyon: Sincanlı, Kırka town, roadsides, 1300 m, 05 vii 1996, Kargioğlu 2208.

Paronychia chionaea Boiss. subsp. *chionaea*

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1800 m, 16 vii 1998, Kargioğlu 2734. Endemic. "LR (nt)"

P. dudleyi Chaudhri

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, stony slopes, 1800 m, 16 vii 1998, Kargioğlu 2735. Endemic, Ir.-Tur. element. "LR (cd)"

P. carica Chaudhri

B3 Afyon: Sincanlı, Tazlar village, Yellice hill, rocky places 1400 m, 26 vii 1996, Kargioğlu 2267. Endemic. "LR (nt)"

POLYGONACEAE

Polygonum lapathifolium L.

B3 Afyon: Sincanlı, Kırka town, damp meadows, 1300 m, 05 vii 1996, Kargioğlu 2205.

P. bellardii All.

B3 Afyon: Sincanlı, Kırka town, damp places, 1300 m, 05 vii 1996, Kargioğlu 2204.

Rumex acetosella L.

B3 Afyon: Sincanlı, south-east of Tazlar village, waste places, 1500 m, 01 vi 1997, Kargioğlu 2380.

R. scutatus L.

B3 Afyon: Sincanlı, Tazlar village, Yellice hill, rocky places, 1500 m, 28 vi 1997, Kargioğlu 2409.

R. crispus L.

B3 Afyon: Sincanlı, Çayhisar village, waste places 1250 m, 10 vii 1996, Kargioğlu 2215.

R. pulcher L.

B3 Afyon: Sincanlı, Tazlar village, Yellice hill, rocky places, 1500 m, 28 vi 1997, Kargioğlu 2408.

R. nepalensis Spreng.

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, clearings of *Pinus nigra* forest, 1550 m, 10 vii 1996, Kargioğlu 2227.

CHENOPODIACEAE

Chenopodium botrys L.

B3 Afyon: Sincanlı, Çobanözü village, roadsides, 1600 m, 14 ix 1997, Kargioğlu 2484.

C. foliosum (Moench) Asch.

B3 Afyon: Sincanlı, around Yürükmezarı village, clear places, 1400 m, 04 ix 1996, Kargioğlu 2299.

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

B3 Afyon: Sincanlı, cultivated land, 1100 m, 04 ix 1996, Kargioğlu 2307.

AMARANTHACEAE

Amaranthus albus L.

B3 Afyon: Sincanlı, Yürükmezarı village, cultivated land, 1400 m, 26 vii 1996, Kargioğlu 2238.

TAMARICACEAE

Tamarix smyrnensis Bunge

B3 Afyon: Hocalar, Yağcı village, Ortadere banks, 1200 m, 28 vi 1998, Kargioğlu 2003.

Myricaria germanica (L.) Desv.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya stream banks, 1400 m, 04 ix 1996, Kargioğlu 2304.

GUTTIFERAE (HYPERICACEAE)

Hypericum confertum Choisy subsp. *confertum*

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, clearings of *Pinus nigra* forest, 1700 m, 12 vi 1996, Kargioğlu 2081.

H. orientale L.

B3 Afyon: Sincanlı, Kırka town, Hisar hill, clearings of *Cistus laurifolius* shrubs, 1340 m, 28 vi 1998, Kargioğlu 2657.

H. origanifolium Willd.

B3 Afyon: Sincanlı, Kınık village, Karata? hill, clearings of *Quercus cerris* forest, 1310 m, 14 vii 1998, Kargioğlu 2691.

H. aviculariifolium Jaub. & Spach subsp. *depilatum* (Freyn & Bornm.) N. Robson var. *depilatum*

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1650 m, 16 vii 1998, Kargioğlu 2766. Endemic, Ir.-Tur. element. "LR (lc)"

Subsp. *depilatum* (Freyn & Bornm.) N. Robson var. *bourgaei* (Boiss.) N. Robson

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, clearings of *Pinus nigra* forest, 1450 m, 21 vi 1996, Kargioğlu 2118. Endemic. "LR (lc)"

H. tetrapterum Fr.

B3 Afyon: Sincanlı, around Tazlar village, wet places, 1400 m, 27 viii 2000, Kargioğlu 2807.

H. perforatum L.

B3 Afyon: Sincanlı, Kınık village, Karata? hill, clearings of *Quercus cerris* forest, 1310 m, 14 vii 1998, Kargioğlu 2692.

MALVACEAE

Malva sylvestris L.

B3 Afyon: Sincanlı, fields, 1200 m, 27 viii 2000, Kargioğlu 2811.

M. neglecta Wallr.

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2633.

Alcea pallida Waldst. & Kit.

B3 Afyon: Sincanlı, roadsides, 1200 m, 27 viii 2000, Kargioğlu 2810.

TILIACEAE

Tilia rubra DC. subsp. *caucasica* (Rupr.) V. Engl.

B3 Afyon: Hocalar, Yağcı village, north of Fındıklı hill, rocky slopes, 1250 m, 31 v 1998, Kargioğlu 2543. Euxine element.

LINACEAE

Linum hirsutum L. subsp. *pseudoanatolicum* P.H. Davis

B3 Afyon: Sincanlı, Tazlar village, Yellice hill, rocky places, 1500 m, 28 vi 1997, Kargioğlu 2407. Endemic, Ir.-Tur. element. "LR (lc)"

L. tenuifolium L.

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2632.

GERANIACEAE

Geranium purpureum Vill.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya stream banks, 1400-1500 m, 03 vii 1996, Kargioğlu 2146.

G. rotundifolium L.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya stream banks, 1400 m, 22 vii 1997, Kargioğlu 2446.

G. molle L. subsp. *molle*

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, stony slopes, 1400 m, 31 v 1998, Kargioğlu 2511.

G. pusillum Burm.

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1450 m, 12 vi 1996, Kargioğlu 2066.

G. tuberosum L. subsp. *tuberosum*

B3 Afyon: Sincanlı, fallow fields, 1150 m, 08 v 1996, Kargioğlu 2021.

G. macrostylum Boiss.

B3 Afyon: Sincanlı, Tazlar village, Yellice hill, slopes, 1500 m, 01 vi 1997, Kargioğlu 2376. E. Medit. (mt.) element.

Erodium ciconium (L.) L'Her.

B3 Afyon: Sincanlı, field and roadsides, 1150 m, 08 v 1996, Kargioğlu 2020.

E. cicutarium (L.) L'Her. subsp. *cicutarium*

B3 Afyon: Hocalar, Yağcı village, fallow fields, 1250 m, 31 v 1997, Kargioğlu 2353.

ZYGOPHYLLACEAE

Zygophyllum fabago L.

B3 Afyon: Sincanlı, waste places, 1100 m, 10 vii 1996, Kargioğlu 2237. Ir.-Tur. element.

ACERACEAE

Acer platanoides L.

B3 Afyon: Hocalar, Yağcı village, north slopes of Fındıklı hill, 1300 m, 31 v 1998, Kargioğlu 2526. Euro-Sib. element.

ANACARDIACEAE

Pistacia terebinthus L. subsp. *terebinthus*

B3 Afyon: Sincanlı, Çobanözü village, Tahtalık stream banks, rocky places, 1500 m, 28 vi 1997, Kargioğlu 2398. Medit. element.

CELASTRACEAE

Euonymus latifolius (L.) Mill. subsp. *latifolius*

B3 Afyon: Sincanlı, Tazlar village, Yellice hill, rocky places, 1500 m, 28 vi 1997, Kargioğlu 2400. Euro-Sib. element.

LEGUMINOSAE (FABACEAE)

Chamaecytisus hirsutus (L.) Link

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya streamsides, 1400 m, 03 vii 1996, Kargioğlu 2145.

Genista tinctoria L.

B3 Afyon: Sincanlı, Kırka town, Koru hill, clearings of *Cistus laurifolius* shrubs, 1480 m, 14 vii 1998, Kargioğlu 2679. Euro-Sib. element.

G. burdurensis Gibbs

B3 Afyon: Sincanlı, Güvercinlik hill, clearings of *Pinus nigra*-*Populus tremula* community, 1600 m, 10 vii 1996, Kargioğlu 2223. Endemic, Ir.-Tur. element. "LR (cd)"

Colutea melanocalyx Boiss. & Heldr. subsp. *melanocalyx*

B3 Afyon: Hocalar, west of Yağcı village, with *Cistus laurifolius*, 1200 m, 13 vi 1998, Kargioğlu 2569. Endemic, E. Medit. element. "EN"

Astragalus hamosus L.

B3 Afyon: Sincanlı, Yürükmezarı village, roadsides, 1200 m, 01 vi 1997, Kargioğlu 2389.

A. oxytropifolius Boiss.

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1500 m, 25 v 1996, Kargioğlu 2056. Ir.-Tur. element.

A. microcephalus Willd.

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, steppe. 1720 m, 16 vii 1998, Kargioğlu 2723. Ir.-Tur. element.

A. strictispinis Boiss.

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, clearings of *Pinus nigra* forest, 1550 m, 16 vii 1998, Kargioğlu 2726. Endemic. "LR (nt)"

A. baibutensis Bunge

B3 Afyon: Sincanlı, Küçükhacet hill, clearings of *Pinus nigra* forest, 1560 m, 16 vii 1988, Kargioğlu 2722. Endemic, Ir.-Tur. element. "LR (lc)"

A. ponticus Pall.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya streamsides, 1400 m, 22 vii 1997, Kargioğlu 2434.

A. odoratus Lam.

B3 Afyon: Sincanlı, Yürükmezarı village, around Küppinari, 1500 m, 12 vi 1996, Kargioğlu 2077.

A. lydus Boiss.

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia*, 900 m, 14 vi 1998, Kargioğlu 2594. Endemic, Ir.-Tur. element. "LR (lc)"

A. macrocephalus Willd. subsp. *finitimus* (Bunge) Chamb.

B3 Afyon: Hocalar, west of Yağcı village, clearings of *Cistus laurifolius* shrubs, 1200 m, 13 vi 1998, Kargioğlu 2565. Ir.-Tur. element.

A. paecilanthus Boiss. & Heldr.

B3 Afyon: Hocalar, Yağcı village, Ortadere district, clearings of *Cistus laurifolius* shrubs, 1400 m, 28 vi 1998, Kargioğlu 2677. Endemic. "LR (nt)"

A. squalidus Boiss. & Noe

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1650 m, 31 v 1998, Kargioğlu 2510. Endemic. "LR (nt)"

A. acmonotrichus Fenzl

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, stony slopes, 1700 m, 08 v 1996, Kargioğlu 2023. Endemic, E. Medit. element. "LR (lc)"

A. campylosema Boiss. subsp. *campylosema*

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia*, 900 m, 14 vi 1998, Kargioğlu 2608. Endemic, Ir.-Tur. element. "LR (lc)"

A. angustifolius Lam. subsp. **angustifolius** var. **angustifolius**

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, steppe. 1750 m, 03 vii 1996, Kargioğlu 2168.

Subsp. **pungens** (Willd.) Hayek

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1550 m, 03 vii 1996, Kargioğlu 2162.

A. vulnerariae DC.

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia*, 900 m, 14 vi 1998, Kargioğlu 2612. Endemic. "LR (lc)"

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

B3 Afyon: Sincanlı, Yürükmezari village, Çataloluk district, clearings of *Pinus nigra* forest, 1450 m, 21 vi 1996, Kargioğlu 2117.

V. cracca L. subsp. **stenophylla** Velen.

B3 Afyon: Sincanlı, Yürükmezari village, Merdivenkaya stream banks, 1400 m, 21 vi 1996, Kargioğlu 2094.

V. villosa Roth subsp. **dasycarpa** (Ten.) Cav.

B3 Afyon: Sincanlı, Çayhisar village, clearings of *Quercus cerris* forest, 1380 m, 16 vii 1998, Kargioğlu 2778.

V. hirsuta (L.) Gray

B3 Afyon: Sincanlı, Kırka town, Hisar hill, clearings of *Cistus laurifolius* shrubs, 1380 m, 28 vi 1998, Kargioğlu 2672.

V. hybrida L.

B3 Afyon: Hocalar, east of Yağcı village, fields, 1200 m, 13 vi 1998, Kargioğlu 2604.

V. lathyroides L.

B3 Afyon: Sincanlı, Tazlar village, Yellice hill, rocky slopes, 1500 m, 01 vi 1997, Kargioğlu 2390.

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

B3 Afyon. Sincanlı, Yürükmezari village, Merdivenkaya stream banks, damp meadows, 1450 m, 12 vi 1996, Kargioğlu 2065.

V. sativa L. subsp. **nigra** (L.) Ehrh. var. **segetalis** (Thuill.) Ser. ex DC.

B3 Afyon: Sincanlı, Yürükmezari village, Merdivenkaya stream banks, 1400 m, 21 vi 1996, Kargioğlu 2096.

V. narbonensis L. var. **narbonensis**

B3 Afyon: Sincanlı, field and roadsides, 1200 m, 13 vi 1998, Kargioğlu 2599.

Lathyrus digitatus (M.Bieb.) Fiori

B3 Afyon: Hocalar, Yağcı village, around Karagöl, clearings of *Pinus nigra* forest, 1500 m, 31 v 1998, Kargioğlu 2535. E. Medit. element.

L. pratensis L.

B3 Afyon: Sincanlı, Yürükmezari village, Merdivenkaya streamsides, 05 vii 1996, Kargioğlu 2199. Euro-Sib. element.

L. laxiflorus (Desf.) Kuntze subsp. **laxiflorus**

B3 Afyon: Sincanlı, Kırka town, Hisar hill, clearings of *Cistus laurifolius* shrubs, 1380 m, 28 vi 1998, Kargioğlu 2670.

L. inconspicuus L.

B2 Afyon: Hocalar, west of Yağcı village, clearings of *Cistus laurifolius* shrubs, 1200 m, 13 vi 1998, Kargioğlu 2571.

L. sativus L.

B3 Afyon: Hocalar, west of Yağcı village, clearings of *Cistus laurifolius* shrubs, 1200 m, 13 vi 1998, Kargioğlu 2572.

L. nissolia L.

B3 Afyon: Sincanlı, Yürükmezari village, Merdivenkaya stream banks, 1400 m, 21 vi 1996, Kargioğlu 2092.

Ononis adenotricha Boiss. var. **adenotricha**

B3 Afyon: Hocalar, west of Yağcı village, clearings of *Cistus laurifolius* shrubs, 1200 m, 13 vi 1998, Kargioğlu 2575. E. Medit. element.

O. pusilla L.

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1650 m, 16 vii 1998, Kargioğlu 2761. Medit. element.

O. spinosa L. subsp. **leiosperma** (Boiss.) Sirj.

B3 Afyon: Sincanlı, Yürükmezari village, Merdivenkaya streamsides, 1400 m, 22 vii 1997, Kargioğlu 2445.

Trifolium nigrescens Viv. subsp. **petrisavii** (Clementi) Holmboe

B3 Afyon: Hocalar, Yağcı village, around Karagöl, clearings of *Pinus nigra* forest, 1500 m, 31 v 1998, Kargioğlu 2536.

T. speciosum Willd.

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2622.

T. campestre Schreb.

B3 Afyon: Hocalar, west of Yağcı village, clearings of *Cistus laurifolius* shrubs, 1200 m, 13 vi 1998, Kargioğlu 2576.

T. dubium Sibth.

B3 Afyon: Sincanlı, Kırka town, Koru hill, clearings of *Cistus laurifolius* shrubs, 1340 m, 28 vi 1998, Kargioğlu 2655.

T. physodes Steven ex M.Bieb. var. **physodes**

B3 Afyon: Sincanlı, Kırka town, Koru hill, clearings of *Cistus laurifolius* shrubs, 1340 m, 28 vi 1998, Kargioğlu 2656. Medit. element.

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

B3 Afyon: Sincanlı, Yürükmezari village, Merdivenkaya stream banks, 1400 m, 21 vi 1996, Kargioğlu 2093.

T. medium L. var. **medium**

B3 Afyon: Hocalar, west of Yağcı village, clearings of *Cistus laurifolius* shrubs, 1200 m, 13 vi 1998, Kargioğlu 2577.

T. ochroleucum Huds.

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, rocky places, 1900 m, 28 vi 1997, Kargioğlu 2427.

T. caudatum Boiss.

B3 Afyon: Hocalar, Yağcı village, around Karagöl, clearings of *Pinus nigra* forest, 1400 m, 13 vi 1998, Kargioğlu 2552. Endemic. "LR (lc)"

T. alpestre L.

B3 Afyon: Sincanlı, Kınık village, Karataş hill, clearings of *Quercus cerris* forest, 1310 m, 14 vii 1998, Kargioğlu 2688. Euro-Sib. element.

T. lucanicum Gasp.

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, rocky places, 1600 m, 28 vi 1997, Kargioğlu 2426. Medit. element.

T. arvense L. var. **arvense**

B3 Afyon: Sincanlı, Yürükmezari village, Çataloluk district, grassy places, 1550 m, 14 iv 1996, Kargioğlu 2008.

Melilotus officinalis (L.) Desr.

B3 Afyon: Sincanlı, Çayhisar village, cultivated fields, 1100 m, 26 vii 1996, Kargioğlu 2274.

Trigonella brachycarpa (Fisch.) Moris

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2624. Ir.-Tur. element.

T. lunata Boiss.

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2625. Ir.-Tur. element.

T. velutina Boiss.

B3 Afyon: Hocalar, west of Yağcı village, clearings of *Cistus laurifolius* shrubs, 1200 m, 13 vi 1998, Kargioğlu 2579. Ir.-Tur. element.

T. aurantiaca Boiss.

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2623. Ir.-Tur. element.

T. fischeriana Ser.

B3 Afyon: Hocalar, west of Yağcı village, clearings of *Cistus laurifolius* shrubs, 1200 m, 13 vi 1998, Kargioğlu 2578. Ir.-Tur. element.

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

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2626. Ir.-Tur. element.

T. monspeliaca L.

B3 Afyon: Sincanlı, south-east of Tazlar village, fallow fields, 1500 m, 01 vi 1997, Kargioğlu 2375. Medit. element.

Medicago orbicularis (L.) Bart.

B3 Afyon: Sincanlı, fallow fields, 1200 m, 13 vi 1998, Kargioğlu 2597.

M. lupulina L.

B3 Afyon: Sincanlı, south-east of Tazlar village, grassy places, 1500 m, 01 vi 1997, Kargioğlu 2374.

M. sativa L. subsp. **sativa**

B3 Afyon: Sincanlı, Yürükmezari village, Çataloluk district, field and roadsides, 1550 m, 10 vii 1996, Kargioğlu 2225.

M. x varia Martyn

B3 Afyon: Hocalar, north-east of Yağcı village, Ortadere district, meadows, 1300 m, 28 vi 1998, Kargioğlu 2665.

M. minima (L.) Bart. var. **minima**

B3 Afyon: Hocalar, west of Yağcı village, fields, 1200 m, 13 vi 1998, Kargioğlu 2574.

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

B3 Afyon: Sincanlı, field and roadsides, 1200 m, 13 vi 1998, Kargioğlu 2598.

Dorycnium pentaphyllum Scop. subsp. **anatolicum** (Boiss.) Gams

B3 Afyon: Sincanlı, Kırka town, Hisar hill, clearings of *Cistus laurifolius* shrubs, 1380 m, 28 vi 1998, Kargioğlu 2679.

Lotus corniculatus L. var. **corniculatus**

B3 Afyon: Sincanlı, Kırka town, Koru hill, clearings of *Cistus laurifolius* shrubs, 1340 m, 28 vi 1998, Kargioğlu 2653.

L. corniculatus L. var. **tenuifolius** L.

B3 Afyon: Hocalar, north-east of Yağcı village, Ortadere district, stream banks, 1300 m, 28 vi 1998, Kargioğlu 2664.

L. corniculatus L. var. **alpinus** Ser.

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, rocky slopes, 1650 m, 04 ix 1996, Kargioğlu 2288.

Tetragonolobus maritimus (L.) Roth

B3 Afyon: Sincanlı, Yürükmezari village, Karapınar district, wet places. 1650 m, 11 ix 1999, Kargioğlu 2786.

Anthyllis vulneraria L. subsp. **boissieri** (Sagorski) Bornm.

B3 Afyon: Hocalar, Yağcı village, clearings of *Cistus laurifolius* shrubs, 1200 m, 13 vi 1998, Kargioğlu 2566.

A. vulneraria L. subsp. **pulchella** (Vis.) Bornm.

B3 Afyon: Sincanlı, Yürükmezari village, Karapınar district, grassy places, 1650 m, 11 ix 1999, Kargioğlu 2785.

Coronilla scorpioides (L.) Koch

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2619.

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

B3 Afyon: Sincanlı, Yürükmezari village, Çataloluk district, field margins, 1500 m, 03 vii 1996, Kargioğlu 2184.

Hedysarum varium Willd.

B3 Afyon: Hocalar, north-east of Yağcı village, Ortadere district, clearings of *Cistus laurifolius* shrubs, 1300 m, 28 vi 1998, Kargioğlu 2663. Ir.-Tur. element.

Onobrychis pisidica Boiss.

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1450 m, 26 vii 1996, Kargioğlu 2265. Endemic, Ir.-Tur. element. "LR (nt)"

O. montana DC. subsp. **cadmea** (Boiss.) P.W.Ball

B3 Afyon: Sincanlı, Yürükmezari village, Çataloluk district, field margins, 1500 m, 03 vii 1996, Kargioğlu 2185.

O. hypargyrea Boiss.

B3 Afyon: Sincanlı, Çayhisar village, clearings of *Quercus cerris* forest, 1380 m, 16 vii 1998, Kargioğlu 2777.

ROSACEAE

Prunus divaricata Ledeb. subsp. **divaricata**

B3 Afyon: Sincanlı, Yürükmezari village, Merdivenkaya streamsides, 1400 m, 26 vii 1996, Kargioğlu 2255.

Filipendula vulgaris Moench

B3 Afyon: Sincanlı, Yürükmezari village, Karapınar district, around spring, moist places, 1650 m, 03 vii 2000, Kargioğlu 2794. Euro-Sib. element.

Rubus caesius L.

B3 Afyon: Sincanlı, Yürükmezari village, Karapınar district, clearings of *Pinus nigra* forest, 1650 m, 11 ix 1999, Kargioğlu 2791.

R. canescens DC. var. **canescens**

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, stony slopes, 1650 m, 04 ix 1996, Kargioğlu 2291.

Potentilla rupestris L.

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, rocky places, 1800 m, 14 vi 1998, Kargioğlu 2648. Euro-Sib. element.

P. argentea L.

B3 Afyon: Sincanlı, Kırka town, Hisar hill, clearings of *Cistus laurifolius* shrubs, 1380 m, 28 vi 1998, Kargioğlu 2673.

P. recta L.

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2641.

P. kotschyana Fenzl

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, stony slopes, 1450 m, 21 vi 1996, Kargioğlu 2122. E. Medit. element.

P. reptans L.

B3 Afyon: Sincanlı, Kırka town, Hisar hill, around spring, 1380 m, 28 vi 1998, Kargioğlu 2674.

Fragaria vesca L.

B3 Afyon: Hocalar, Yağcı village, Karagöl district, moist places in *Pinus nigra* forest, 1500 m, 13 vi 1998, Kargioğlu 2548.

Geum urbanum L.

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, clearings of *Pinus nigra* forest, 1500 m, 21 vi 1996, Kargioğlu 2121. Euro-Sib. element.

Agrimonia eupatoria L.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya stream banks, damp meadows, 1400 m, 03 vii 1996, Kargioğlu 2148.

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

B3 Afyon: Sincanlı, Yürükmezarı village, clearings of *Pinus nigra* forest, 1500 m, 21 vi 1996, Kargioğlu 2111.

Alchemilla bursensis Pawl.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya stream banks, 1400 m, 22 vii 1997, Kargioğlu 2450. Endemic, Euxine element. "EN"

Rosa hemisphaerica Herrm.

B3 Afyon: Hocalar, west of Yağcı village, clear places, 1200 m, 13 vi 1998, Kargioğlu 2582. Ir.-Tur. element.

R. pulverulenta M.Bieb.

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, stony slopes, 1650 m, 04 ix 1996, Kargioğlu 2290.

R. canina L.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya stream banks, 1400 m, 21 vi 1996, Kargioğlu 2103.

Pyracantha coccinea Roem.

B3 Afyon: Sincanlı, Çobanözü village, Tahtalık stream banks, rock slopes, 1350 m, 14 ix 1997, Kargioğlu 2476.

Sorbus umbellata (Desf.) Fritsch var. *umbellata*

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, rocky places, 1900 m, 28 vi 1997, Kargioğlu 2432.

Malus sylvestris Mill. subsp. *orientalis* (Uglitzk.) Browicz var. *orientalis*

B3 Afyon: Sincanlı, Yürükmezarı village, Karapınar district, around spring 1650 m, 11 ix 1999, Kargioğlu 2790.

Pyrus elaeagnifolia Pall. subsp. *elaeagnifolia*

B3 Afyon: Sincanlı, Yürükmezarı village, edge of *Pinus nigra* forest, 1300 m, 04 ix 1996, Kargioğlu 2300.

LYTHRACEAE

Lythrum salicaria L.

B3 Afyon: Sincanlı, south of Çobanözü village, clearings of *Pinus nigra* forest, dry pool bed, 1600 m, 14 ix 1997, Kargioğlu 2485. Euro-Sib. element.

ONAGRACEAE

Epilobium angustifolium L.

B3 Afyon: Sincanlı, Yürükmezarı village, Karapınar district, clearings of *Cistus laurifolius* shrubs, 1650 m, 10 vii 1996, Kargioğlu 2234.

E. dodonaei Vill.

B3 Afyon: Sincanlı, Yürükmezarı village, stony slopes, 1250 m, 10 vii 1996, Kargioğlu 2213. Euro-Sib. element.

E. hirsutum L.

B3 Afyon: Sincanlı, Yürükmezarı village, around Küppınarı, wet places, 1650 m, 04 ix 1996, Kargioğlu 2285.

E. montanum L.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya streamsides, 1400 m, 22 vii 1997, Kargioğlu 2448. Euro-Sib. element.

E. lanceolatum Seb. & Mauri

B3 Afyon: Sincanlı, Kırka town, Güvercinlik hill, clearings of *Pinus nigra*-*Populus tremula* community, 1560 m, 15 vii 1998, Kargioğlu 2712.

CRASSULACEAE

Sedum amplexicaule DC.

B3 Afyon: Sincanlı, Tazlar village, Yellice hill, rocky places, 1500 m, 28 vi 1997, Kargioğlu 2402. Medit. element.

S. laconicum Boiss. & Heldr.

B3 Afyon: Sincanlı, Ahırdağı, Büyükkaşak hill, in *Astragalus microcephalus* steppe, 1650 m, 22 vii 1997, Kargioğlu 2461. E. Medit. element.

S. pallidum M.Bieb. var. *pallidum*

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2617.

S. pallidum M.Bieb. var. *bithynicum* (Boiss.) Chamb.

B3 Afyon: Sincanlı, Kırka town, Güvercinlik hill, clearings of *Pinus nigra*-*Populus tremula* community, 1560 m, 15 vii 1998, Kargioğlu 2706. Euxine element.

SAXIFRAGACEAE

Saxifraga sibirica L. subsp. *sibirica*

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, rocky places, 1800 m, 31 v 1998, Kargioğlu 2524.

PARNASSIACEAE

Parnassia palustris L.

B3 Afyon: Sincanlı, Yürükmezarı village, around Küppınarı, wet meadows, 1700 m, 14 ix 1997, Kargioğlu 2490.

UMBELLIFERAE (APIACEAE)

Eryngium campestre L. var. *virens* Link

B3 Afyon: Sincanlı, Tazlar village, disturbed steppe, 1400 m, 27 viii 2000, Kargioğlu 2801.

Scandix iberica M.Bieb.

B3 Afyon: Hocalar, west of Yağcı village, clearings of *Cistus laurifolius* shrubs, 1200 m, 13 vi 1998, Kargioğlu 2560.

S. pecten-veneris L.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya stream banks, 1400 m, 21 vi 1996, Kargioğlu 2084.

S. macrorhyncha C.A.Mey.

B3 Afyon: Sincanlı, Ahırdağı, Büyükkaşak hill, in *Astragalus microcephalus* steppe, 1800 m, 16 vii 1998, Kargioğlu 2718.

Bunium microcarpum (Boiss.) Freyn
subsp. **microcarpum**

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1450 m, 12 vi 1996, Kargioğlu 2072. E. Medit. element.

Pimpinella tragium Vill. subsp. **lithophila** (Schischk.) Tutin

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1450 m, 26 vii 1996, Kargioğlu 2260.

Subsp. **polyclada** (Boiss. & Heldr.) Tutin

B3 Afyon: Sincanlı, Güvercinlik hill, clearings of *Pinus nigra*-*Populus tremula* community, 1600 m, 10 vii 1996, Kargioğlu 2235.

Seseli tortuosum L.

B3 Afyon: Sincanlı, Tazlar village, disturbed steppe, 1400 m, 27 viii 2000, Kargioğlu 2803.

Falcaria vulgaris Bernh.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya streamsides, 1400 m, 26 vii 1996, Kargioğlu 2240.

Ferulago macrosciadia Boiss. & Bal.

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1650 m, 16 vii 1998, Kargioğlu 2753. Endemic, E. Medit. element. "LR (lc)"

F. aucheri Boiss.

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1450 m, 26 vii 1996, Kargioğlu 2258. Endemic. "LR (lc)"

Pastinaca sativa L. subsp. **urens** (Req. ex Godr.) Celak

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya streamsides, 1400 m, 22 vii 1997, Kargioğlu 2436.

Malabaila secacul Banks & Sol.

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1450 m, 26 vii 1996, Kargioğlu 2259.

Heracleum platytaenium Boiss.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya streamsides, 1400 m, 22 vii 1997, Kargioğlu 2435. Endemic. "LR (lc)"

Torilis ucranica Spreng.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya streamsides, 1400 m, 26 vii 1996, Kargioğlu 2243.

T. leptophylla (L.) Reichb.

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, field margins, 1500 m, 03 vii 1996, Kargioğlu 2178.

Caucalis platycarpus L.

B3 Afyon: Hocalar, west of Yağcı village, clearings of *Cistus laurifolius* shrubs, 1200 m, 13 vi 1998, Kargioğlu 2559.

Turgenia latifolia (L.) Hoffm.

B3 Afyon: Sincanlı, cultivated places, 1200 m, 28 vi 1997, Kargioğlu 2413.

Daucus carota L.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya streamsides, 1400 m, 22 vii 1997, Kargioğlu 2433.

CORNACEAE

Cornus sanguinea L. subsp. **australis** (C.A.Mey.) Jav.

B3 Afyon: Sincanlı, Çobanözü village, Tahtalık stream banks, rocky slopes, 1350 m, 14 ix 1997, Kargioğlu 2474. Euro-Sib. element.

CAPRIFOLIACEAE

Sambucus ebulus L.

B3 Afyon: Sincanlı, west of Çobanözü village, roadside banks in valley, 1350 m, 14 ix 1997, Kargioğlu 2472. Euro-Sib. element.

S. nigra L.

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, edge of *Pinus nigra* forest, 1500 m, 27 viii 2000, Kargioğlu 2805. Euro-Sib. element.

Viburnum lantana L.

B3 Afyon: Sincanlı, Tazlar village, Yellice hill, rocky slopes, 1500 m, 01 vi 1997, Kargioğlu 2388. Euro-Sib. element.

V. opulus L.

B3 Afyon: Sincanlı, Çobanözü village, Tahtalık stream banks, rocky slopes, 1350 m, 27 vii 2000, Kargioğlu 2806. Euro-Sib. element.

Lonicera caucasica Pall. subsp. **orientalis** (Lam.) Chamb. & Long

B3 Afyon: Sincanlı, Tazlar village, Yellice hill, rocky places, 1500 m, 28 vi 1997, Kargioğlu 2397. Endemic. "LR (lc)"

L. etrusca Santi var. **etrusca**

B3 Afyon: Sincanlı, Çobanözü village, Tahtalık stream banks, rocky slopes, 1350 m, 14 ix 1997, Kargioğlu 2471. Medit. element.

VALERIANACEAE

Valerianella coronata (L.) DC.

B3 Afyon: Sincanlı, Çayhisar village, field and roadsides, 1200 m, 21 vi 1996, Kargioğlu 2105.

V. glomerata Boiss. & Bal.

B3 Afyon: Sincanlı, south-east of Tazlar village, fields, 1300 m, 01 vi 1997, Kargioğlu 2381. Endemic, Ir.-Tur. element. "LR (lc)"

V. vesicaria (L.) Moench

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2645.

MORINACEAE

Morina persica L.

B3 Afyon: Sincanlı, roadsides, 1200 m, 27 viii 2000, Kargioğlu 2812.

Ir.-Tur. element.

DIPSACACEAE

Dipsacus laciniatus L.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya stream banks, 1400 m, 04 ix 1996, Kargioğlu 2302.

Scabiosa argentea L.

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, field and roadsides, 1550 m, 10 vii 1996, Kargioğlu 2221.

S. rotata M.Bieb.

B3 Afyon: Sincanlı-Yürükmezarı road, roadsides, 1200 m, 31 v 1997, Kargioğlu 2361.

Ir.-Tur. element.

COMPOSITAE (ASTERACEAE)

Xanthium strumarium L. subsp. **strumarium**

B3 Afyon: Sincanlı, around Yürükmezarı village, clearings, 1400 m, 04 ix 1996, Kargioğlu 2297.

Inula salicina L.

B3 Afyon: Sincanlı, Yürükmezarı village, moist ground by Merdivenkaya stream, 1400 m, 26 vii 1996, Kargioğlu 2246. Euro-Sib. element.

I. oculus-christi L.

B3 Afyon: Sincanlı, Yürükmezarı village, Karapınar district, clearings of *Pinus nigra-Cistus laurifolius* community, 1600 m, 10 vii 1996, Kargioğlu 2232.

Euro-Sib. element.

Pulicaria dysenterica (L.) Bernh.

B3 Afyon: Sincanlı, Çobanözü village, Tahtalık stream, edge of water, 1550 m, 16 vii 1998, Kargioğlu 2752.

Helichrysum plicatum DC. subsp. plicatum

B3 Afyon: Sincanlı, Tazlar village, Yellice hill, rocky slopes, 1500 m, 28 vi 1997, Kargioğlu 2411.

Logfia arvensis (L.) Holub

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1800 m, 16 vii 1998, Kargioğlu 2720.

Erigeron acer L. subsp. pycnotrichus (Vierh.) Grierson

B3 Afyon: Sincanlı, Yürükmezarı village, moist ground by Merdivenkaya stream, 1400 m, 22 vii 1997, Kargioğlu 2440. Euro-Sib. element.

Bellis perennis L.

B3 Afyon: Sincanlı, Yürükmezarı-Yağcı villages road, Çavdarlı district, wet stream bed, 1500 m, 25 v 1996, Kargioğlu 2055. Euro-Sib. element.

Doronicum orientale Hoffm.

B3 Afyon: Hocalar, Yağcı village, shady places in *Pinus nigra* forest, 1600 m, 31 v 1997, Kargioğlu 2354.

Senecio castagneanus DC.

B3 Afyon: Sincanlı, Kırka town, Güvercinlik hill, clearings of *Pinus nigra-Populus tremula* community, 1560 m, 15 vii 1998, Kargioğlu 2701.

Endemic, E. Medit. element. "LR (lc)"

S. vernalis Waldst. & Kit.

B3 Afyon: Sincanlı, around Çayırhisar village, rocky slopes, 1300 m, 04 v 1997, Kargioğlu 2337.

Tussilago farfara L.

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, moist places, 1550 m, 14 iv 1996, Kargioğlu 2007. Euro-Sib. element.

Anthemis aciphylla Boiss. var. aciphylla

B3 Afyon: Sincanlı, south-east of Tazlar village, clearings, 1500 m, 01 vi 1997, Kargioğlu 2365. Endemic, E. Medit. element. "LR (lc)"

A. tinctoria L. var. tinctoria

B3 Afyon: Sincanlı, Kınık village, Karataş hill, clearings of *Quercus cerris* forest, 1310 m, 14 vii 1998, Kargioğlu 2681.

A. coelopoda Boiss. var. bourgaei Boiss.

B3 Afyon: Sincanlı, south of Çobanözü village, fields, 1200 m, 14 ix 1997, Kargioğlu 2470.

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

B3 Afyon: Sincanlı, south-east of Tazlar village, clearings, 1500 m, 01 vi 1997, Kargioğlu 2366. Endemic. "LR (lc)"

Achillea teretifolia Willd.

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1750 m, 03 vii 1996, Kargioğlu 2165. Endemic, Ir.-Tur. element. "LR (lc)"

A. millefolium L. subsp. millefolium

B3 Afyon: Sincanlı, Yürükmezarı village, moist ground by Merdivenkaya stream, 1400 m, 26 vii 1996, Kargioğlu 2244. Euro-Sib. element.

A. setacea Waldst. & Kit.

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, fallow fields, 1500 m, 03 vii 1996, Kargioğlu 2179. Euro-Sib. element.

A. coarctata Poir.

B3 Afyon: Sincanlı, Kırka town, roadsides, 1300 m, 05 vii 1996, Kargioğlu 2207.

A. biebersteinii Afan.

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, field and roadsides, 1550 m, 10 vii 1996, Kargioğlu 2216. Ir.-Tur. element.

Tanacetum parthenium (L.) Sch. Bip.

B3 Afyon: Hocalar, Yağcı village, north of Fındıklı hill, shady places, 1300 m, 28 vi 1998, Kargioğlu 2651.

T. armenum (DC.) Sch. Bip.

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, clearings of *Pinus nigra* forest, 1700 m, 12 vi 1996, Kargioğlu 2080.

Tripleurospermum sevannense (Manden.) Pobed.

B3 Afyon: Sincanlı-Çayhisar road, moist meadows, 1100 m, 26 vii 1996, Kargioğlu 2272.

Artemisia campestris L.

B3 Afyon: Sincanlı-Çayhisar village road, sandy places, 1100 m, 04 ix 1996, Kargioğlu 2305.

Arctium minus (Hill) Bernh. subsp. pubens (Bab.) Arenes

B3 Afyon: Sincanlı, Çobanözü village, around Tahtalık stream, clearings of *Pinus nigra* forest, 1500 m, 14 ix 1997, Kargioğlu 2478. Euro-Sib. element.

Onopordum anatolicum (Boiss.) Eig

B3 Afyon: Sincanlı-Çayhisar road, roadsides, 1100 m, 26 vii 1996, Kargioğlu 2276.

Endemic, Ir.-Tur. element. "LR (lc)"

Cirsium vulgare (Savi) Ten.

B3 Afyon: Sincanlı, Yürükmezarı village, clear places, 1400 m, 04 ix 1996, Kargioğlu 2296.

C. creticum (Lam.) d' Urv. subsp. creticum

B3 Afyon: Sincanlı, Yürükmezarı village, around Küppinari, 1700 m, 14 ix 1997, Kargioğlu 2487. E. Medit. element.

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

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya streamsides, 1400 m, 22 vii 1997, Kargioğlu 2438.

Jurinea consanguinea DC.

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2607.

J. pontica Hausskn. & Freyn ex Hausskn.

B3 Afyon: Sincanlı, Yürükmezarı village-Yağcı village road, roadsides, 1550 m, 03 vii 1996, Kargioğlu 2166. Endemic, Ir.-Tur. element. "LR (lc)"

Centaurea cariensis Boiss. subsp. **maculiceps** (O.Schwarz) Wagenitz

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1400 m, 26 vii 1996, Kargioğlu 2245. Endemic, E. Medit. element. "LR (lc)"

Subsp. **microlepis** (Boiss.) Wagenitz

B3 Afyon: Sincanlı-Yürükmezarı village road, roadsides 1250 m, 10 vii 1996, Kargioğlu 2209. Endemic, E. Medit. element. "LR (nt)"

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

B3 Afyon: Sincanlı-Çayhisar road, roadsides, 1100 m, 26 vii 1996, Kargioğlu 2275.

C. urvillei DC. subsp. **stepposa** Wagenitz

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2607. Ir.-Tur. element.

C. reuterana Boiss. var. **reuterana**

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, steppe, 1750 m, 25 v 1996, Kargioğlu 2034.

C. pichleri Boiss. subsp. **pichleri**

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, steppe, 1750 m, 25 v 1996, Kargioğlu 2033.

C. triumfettii All.

B3 Afyon: Sincanlı, around Çöğürlü plateau, clearings of *Pinus nigra-Cistus laurifolius* community, 1650 m, 22 vi 1996, Kargioğlu 2127.

C. depressa M.Bieb.

B3 Afyon: Sincanlı, field and roadsides, 1200 m, 13 vi 1998, Kargioğlu 2592.

Xeranthemum annuum L.

B3 Afyon: Sincanlı-Yürükmezarı village road, roadsides 1250 m, 10 vii 1996, Kargioğlu 2212.

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

B3 Afyon: Sincanlı, fallow fields, 1100 m, 26 vii 1996, Kargioğlu 2281.

Scolymus hispanicus L.

B3 Afyon: Sincanlı-Çayhisar road, roadsides, 1100 m, 26 vii 1996, Kargioğlu 2277.

Medit. element.

Cichorium intybus L.

B3 Afyon: Sincanlı-Yürükmezarı village road, roadsides 1250 m, 10 vii 1996, Kargioğlu 2210.

Scorzonera cana (C.A.Mey.) Hoffm. var. **cana**

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1500 m, 25 v 1996, Kargioğlu 2042.

S. eriophora DC.

B3 Afyon: Hocalar, north-east of Yağcı village, Ortadere district, clearings of *Cistus laurifolius* shrubs, 1300 m, 28 vi 1998, Kargioğlu 2659. Endemic. "LR (lc)"

Tragopogon latifolius Boiss. var. **latifolius**

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, field and roadsides, 1550 m, 10 vii 1996, Kargioğlu 2218.

T. latifolius Boiss. var. **angustifolius** Boiss.

B3 Afyon: Sincanlı, field and roadsides, 1200 m, 13 vi 1998, Kargioğlu 2593.

Ir.-Tur. element.

Leontodon asperrimus (Willd.) Ball

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1800 m, 16 vii 1998, Kargioğlu 2719. Ir.-Tur. element.

L. crispus Vill. subsp. **asper** (Waldst. & Kit.) Rohlena var. **asper**

B3 Afyon: Hocalar, west of Yağcı village, clearings of *Cistus laurifolius* shrubs, 1200 m, 13 vi 1998, Kargioğlu 2561.

Picris strigosa M.Bieb.

B3 Afyon; Sincanlı-Yürükmezarı village road, roadsides 1250 m, 10.07.1996, Kargioğlu 2211. Ir.-Tur. element.

Rhagadiolus angulosus (Jaub. & Spach.) Kupicha

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya stream banks, 1400 m, 21 vi 1996, Kargioğlu 2085. Ir.-Tur. element.

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

B3 Afyon: Sincanlı, Çobanözü village, around Tahtalık stream, clearings of *Pinus nigra* forest, 1600 m, 14 ix 1997, Kargioğlu 2482.

Hieracium labillardierei Arv.-Touv.

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1450 m, 12 vi 1996, Kargioğlu 2073.

H. pannosum Boiss.

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1450 m, 26 vii 1996, Kargioğlu 2263. E. Medit. element.

Pilosella hoppeana (Schult.) C.H. & F.W.Schultz subsp. **troica** (Zahn) P.D.Sell & West

B3 Afyon: Sincanlı, around Çöğürlü plateau, clearings of *Cistus laurifolius* shrubs, 1480 m, 14 vii 1998, Kargioğlu 2678.

P. piloselloides (Vill.) Sojak subsp. **megalomastix** (NP.) P.D.Sell & West

B3 Afyon: Sincanlı, Kırka town, Hisar hill, clearings of *Cistus laurifolius* shrubs, 1380 m, 28 vi 1998, Kargioğlu 2670.

Scariola viminea (L.) F.W.Schmidt

B3 Afyon: Sincanlı, south-east of Çayhisar, clearings of *Quercus cerris* community, 1380 m, 27 viii 2000, Kargioğlu 2804.

Lapsana communis L. subsp. **adenophora** (Boiss.) Rech.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya streamsides, 1400 m, 22 vii 1997, Kargioğlu 2441.

Taraxacum bessarabicum (Hornem.) Hand.-Mazz. subsp. **bessarabicum**

B3 Afyon: Sincanlı, west of Afyon, Aellen 1967: 1008!

T. serotinum (Waldst. & Kit.) Poir.

B3 Afyon: Sincanlı, Yürükmezarı village, Karapınar district, dry places, 1500 m, 01 xi 1996, Kargioğlu 2311.

T. buttleri Soest

B3 Afyon: Sincanlı, Güvercinlik hill, stony places, 1900 m, 31 v 1997, Kargioğlu 2346.

Chondrilla juncea L. var. **acantholepis** (Boiss.) Boiss.

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1650 m, 22 vii 1997, Kargioğlu 2457.

Crepis foetida L. subsp. **rheoadifolia** (M.Bieb.) Celak.

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, field and roadsides, 1550 m, 10 vii 1996, Kargioğlu 2217.

C. sancta (L.) Babc.

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1500 m, 25 v 1996, Kargioğlu 2041.

CAMPANULACEAE

Campanula iconia Phitos

B3 Afyon: Sincanlı, Tazlar village, Yellice hill, rocky places, 1500 m, 28 vi 1997, Kargioğlu 2395. Endemic, Ir.-Tur. element. "EN"

C. lyrata Lam. subsp. *lyrata*

B3 Afyon: Sincanlı, Kınık village, Karata? hill, clearings of *Quercus cerris* forest, 1310 m, 14 vii 1998, Kargioğlu 2683. Endemic. "LR (lc)"

C. cymbalaria Sm.

B3 Afyon: Sincanlı, Tazlar village, Yellice hill, rocky places, 1500 m, 01 vi 1997, Kargioğlu 2387. E. Medit. (mt.) element.

Asyneuma limonifolium (L.) Janchen subsp. *limonifolium*

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1800 m, 16 vii 1998, Kargioğlu 2724.

Subsp. *pestalozzae* (Boiss.) Damboldt

B3 Afyon: Hocalar, north-east of Yağcı village, Ortadere district, clearings of *Cistus laurifolius* shrubs, 1300 m, 28 vi 1998, Kargioğlu 2661. Endemic. "LR (lc)"

Legousia speculum-veneris (L.) Chaix

B2 Afyon: Hocalar, west of Yağcı village, clearings of *Cistus laurifolius* shrubs, 1200 m, 13 vi 1998, Kargioğlu 2567. Medit. element.

L. pentagonia (L.) Thell.

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2611. E. Medit. element.

ERICACEAE

Pyrola chlorantha Sw.

B3 Afyon: Hocalar, Yağcı village, around Karagöl, *Pinus nigra* forest, 1500 m, 13 vi 1998, Kargioğlu 2562.

PRIMULACEAE

Primula vulgaris Huds. subsp. *vulgaris*

B3 Afyon: Sincanlı, Yürükmezari village, Karapınar district, clearings of *Pinus nigra* forest, 1650 m, 01 v 1997, Kargioğlu 2327. Euro-Sib. element.

Androsace maxima L.

B3 Afyon: Sincanlı, west of Çayırhisar village, fallow fields, 1300 m, 04 v 1997, Kargioğlu 2341.

Cyclamen coum Mill. var. *coum*

B3 Afyon: Hocalar, Ahırdağı, Ardıçlı hill, clearings of *Quercus cerris-Cistus laurifolius* community, 1400 m, 18 iv 1988, Kargioğlu 2497.

Lysimachia punctata L.

B3 Afyon: Sincanlı, Çobanözü village, around Tahtalık stream, clearings of *Pinus nigra* forest, dry pool beds, 1600 m, 14 ix 1997, Kargioğlu 2486. Euro-Sib. element.

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

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2640.

OLEACEAE

Jasminum fruticans L.

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2635. Medit. element.

Ligustrum vulgare L.

B3 Afyon: Sincanlı, south of Çobanözü village, moist places in valley, 1350 m, 14 ix 1997, Kargioğlu 2475. Euro-Sib. element.

ASCLEPIADACEAE

Vincetoxicum fuscatum (Hornem.) Reichb. subsp. *fuscatum*

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2606.

GENTIANACEAE

Centaurium erythraea Rafn subsp. *turcicum* (Velen.) Melderis

B3 Afyon: Sincanlı, south-east of Tazlar village, damp meadows, 1500 m, 01 vi 1997, Kargioğlu 2382.

CONVOLVULACEAE

Convolvulus arvensis L.

B3 Afyon: Sincanlı, Kırka town, Hisar hill, clearings of *Cistus laurifolius* shrubs, 1380 m, 28 vi 1998, Kargioğlu 2676.

CUSCUTACEAE

Cuscuta palaestina Boiss. subsp. *balansae* (Yunck.) Plitmann

B3 Afyon: Sincanlı, Yürükmezari village, around Küppinari, on *Sambucus ebulus*, 1700 m, 14 ix 1997, Kargioğlu 2489.

C. brevistyla A. Braun

B3 Afyon: Sincanlı, Yürükmezari village, Merdivenkaya streamsides, on *Vicia sp.*, 1400 m, 22 vii 1997, Kargioğlu 2444.

BORAGINACEAE

Lappula barbata (M.Bieb.) Gürke

B3 Afyon: Hocalar, west of Yağcı village, field margins, 1200 m, 13 vi 1998, Kargioğlu 2546. Ir.-Tur. element.

Rochelia cancellata Boiss. & Bal.

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, stony places, 1800 m, 31 v 1998, Kargioğlu 2538. Ir.-Tur. element.

R. disperma (L.f.) K.Koch var. *disperma*

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1800 m, 22 vii 1997, Kargioğlu 2465.

Myosotis ramosissima Rochel ex Schult. subsp. *ramosissima*

B2 Afyon: Hocalar, Yağcı village, Fındıklı hill, stony places, 1250 m, 31 v 1998, Kargioğlu 2539.

M. stricta Link ex Roem. & Schult.

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1700 m, 31 v 1998, Kargioğlu 2502. Euro-Sib. element.

M. refracta Boiss. subsp. *refracta*

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1500 m, 25 v 1996, Kargioğlu 2043. Medit. element.

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

B3 Afyon: Sincanlı, Kırka town, around Çözürlü plateau, stony dry stream bed, clearings of *Pinus nigra* forest, 1550 m, 22 vi 1996, Kargioğlu 2136.

M. lithospermifolia (Willd.) Hornem.

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1650-1700 m, 31 v 1998, Kargioğlu 2501.

Cynoglossum creticum Mill.

B3 Afyon: Hocalar, west of Yağcı village, clearings of *Cistus laurifolius* shrubs, 1200 m, 13 vi 1998, Kargioğlu 2564.

Buglossoides arvensis (L.) Johnston

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, rocky places, 1900 m, 28 vi 1997, Kargioğlu 2416.

Echium orientale L.

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, rocky places, 1900 m, 28 vi 1997, Kargioğlu 2419. Endemic, Euxine element. "LR (lc)"

E. italicum L.

B3 Afyon: Sincanlı-Çayhisar road, roadsides, 1100 m, 26 vii 1996, Kargioğlu 2278.

Medit. element.

Onosma tauricum Pall. ex Willd. var. **tauricum**

B2 Afyon: Hocalar, north-east of Yağcı village, Ortadere district, clearings of *Cistus laurifolius* shrubs, 1300 m, 28 vi 1998, Kargioğlu 2660.

O. aucheranum DC.

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1500 m, 01 vi 1997, Kargioğlu 2367. E. Medit. element.

Cerintho minor L. subsp. **auriculata** (Ten.) Domac

B3 Afyon: Hocalar, west of Yağcı village, clearings of *Cistus laurifolius* shrubs, 1200 m, 13 vi 1998, Kargioğlu 2563.

Anchusa undulata L. subsp. **hybrida** (Ten.) Cout.

B3 Afyon: Hocalar, Yağcı village, field margins, 1500 m, 31 v 1998, Kargioğlu 2525.

Medit. element.

A. azurea Mill. var. **azurea**

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, field margins, 1550 m, 10 vii 1996, Kargioğlu 2219.

Alkanna tinctoria (L.) Tausch subsp. **glandulosa** Hub.-Mor.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya stream banks, 1400 m, 21 vi 1996, Kargioğlu 2086. Endemic, E. Medit. element. "LR (cd)"

SOLANACEAE

Solanum nigrum L. subsp. **nigrum**

B3 Afyon: Sincanlı, cultivated ground, 1100 m, 04 ix 1996, Kargioğlu 2309.

Hyoscyamus niger L.

B3 Afyon: Hocalar, Yağcı village, roadsides, 1500 m, 31 v 1998, Kargioğlu 2528.

SCROPHULARIACEAE

Verbascum adenocarpum Hub.-Mor.

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1580 m, 15 vii 1988, Kargioğlu 2708. Endemic, Ir.-Tur. element. "VU"

V. phrygium Bornm.

B3 Afyon: Sincanlı, Çobanözü village, Tahtalık stream banks, 1340 m, 16 vii 1998, Kargioğlu 2729. Endemic, Ir.-Tur. element. "LR (cd)"

V. krauseanum Murb.

B3 Afyon: Sincanlı, Çayhisar village, stony slopes, 1400 m, 31 v 1997, Kargioğlu 2363.

Endemic, Ir.-Tur. element. "LR (nt)"

V. varians Freyn & Sint. var. **varians**

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1650 m, 22 vii 1997, Kargioğlu 2456.

V. stenostachyum Hub.-Mor.

B3 Afyon: Sincanlı, Çobanözü village, around Tahtalık stream, clearings of *Pinus nigra* forest, 1500 m, 14 ix 1997, Kargioğlu 2481. Endemic, Ir.-Tur. element. "LR (nt)"

V. uschakense (Murb.) Hub.-Mor.

B3 Afyon: Hocalar, Yağcı village, Aletdüzen farm, roadsides, 1340 m, 16 vii 1998, Kargioğlu 2755. Endemic, Ir.-Tur. element. "LR (lc)"

V. lasianthum Boiss. ex Benth.

B3 Afyon: Sincanlı, Tazlar village, Yellice hill, rocky places, 1500 m, 01 vi 1997, Kargioğlu 2386.

V. insulare Boiss. & Heldr.

B3 Afyon: Sincanlı, Çobanözü village, around Tahtalık stream, clearings of *Pinus nigra* forest, 1350 m, 16 vii 1998, Kargioğlu 2754. Endemic, Ir.-Tur. element. "LR (lc)"

Scrophularia scopoli (Hoppe ex) Pers. var. **scopoli**

B3 Afyon: Sincanlı, Kırka town, around Çözürlü plateau, moist stony places, clearings of *Pinus nigra* forest, 1550 m, 22 vi 1996, Kargioğlu 2138.

S. umbrosa Dumort.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya stream banks, 1400 m, 22 vii 1997, Kargioğlu 2453. Euro-Sib. element.

Chaenorhinum minus (L.) Lange subsp. **minus**

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2620.

Linaria genistifolia (L.) Mill. subsp. **confertiflora** (Boiss.) P.H.Davis

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya streamsides, 1400 m, 22 vii 1997, Kargioğlu 2452. Ir.-Tur. element.

L. grandiflora Desf.

B3 Afyon: Sincanlı, field and roadsides, 1200 m, 13 vi 1998, Kargioğlu 2595.

Ir.-Tur. element.

L. corifolia Desf.

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2643. Endemic, Ir.-Tur. element. "LR (lc)"

L. simplex (Willd.) DC.

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2644. Medit. element.

Digitalis ferruginea L. subsp. *ferruginea*

B3 Afyon: Sincanlı, around Küppinari, clearings of *Pinus nigra* forest, 1650 m, 04 ix 1996, Kargioğlu 2292. Euro-Sib. element.

Veronica bozakmanii M.A.Fisch.

B3 Afyon: Hocalar, around Yağcı village, clearings of *Pinus nigra* forest, 1500 m, 31 v 1998, Kargioğlu 2537. Ir.-Tur. element.

V. triphyllus L.

B3 Afyon: Sincanlı, Yürükmezarı village, Karapınar district, clearings of *Pinus nigra* forest, 1600 m, 01 vi 1997, Kargioğlu 2393.

V. triloba (Opiz) Kerner

B3 Afyon: Sincanlı, Çobanözü village, around Tahtalık stream, clearings in *Pinus nigra*, 1300 m, 18 iv 1988, Kargioğlu 2499.

V. hederifolia L.

B2 Afyon: Hocalar, Yağcı village, Fındıklı hill, shady rocky places, 1250 m, 31 v 1998, Kargioğlu 2542.

V. anagallis-aquatica L.

B3 Afyon: Sincanlı, Tazlar village, springs, 1400 m, 27 viii 2000, Kargioğlu 2814.

V. chamaedrys L.

B3 Afyon: Sincanlı, Kınık village, Karata? hill, clearings of *Quercus cerris* forest, 1310 m, 14 vii 1998, Kargioğlu 2698. Euro-Sib. element.

V. pectinata L. var. *glandulosa* Riek ex M.A.Fisch.

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1600 m, 16 vii 1998, Kargioğlu 2747.

V. multifida L.

B2 Afyon: Hocalar, west of Yağcı village, clearings of *Cistus laurifolius* shrubs, 1200 m, 13 vi 1998, Kargioğlu 2584. Endemic, Ir.-Tur. element. "LR (lc)"

Euphrasia pectinata Ten.

B3 Afyon: Sincanlı, Kırka town, around Çöğürlü plateau, clearings of *Cistus laurifolius* shrubs, 1480 m, 14 vii 1998, Kargioğlu 2680. Euro-Sib. element.

Odontites verna (Bellardi) Dumort. subsp. *serotina* (Dumort.) Corb.

B3 Afyon: Sincanlı, Yürükmezarı village, damp meadows, 1450 m, 04 ix 1996, Kargioğlu 2293. Euro-Sib. element.

Pedicularis comosa L. var. *acmodonta* (Boiss.) Boiss.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya stream banks, damp meadows, 1400 m, 12 vi 1996, Kargioğlu 2070.

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

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya streamsides, damp meadows, 1400 m, 12 vi 1996, Kargioğlu 2074.

OROBANCHACEAE

Orobanche mutellii Schultz

B3 Afyon: Sincanlı, on *Lycopersicum* sp., 1100 m, 04 ix 1996, Kargioğlu 2308.

O. minor Sm.

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, on *Lathyrus* sp., 1650 m, 16 vii 1998, Kargioğlu 2769.

ACANTHACEAE

Acanthus hirsutus Boiss.

B3 Afyon: Sincanlı, fallow fields, 1150 m, 22 v 1996, Kargioğlu 2030.

Endemic. "LR (lc)"

GLOBULARIACEAE

Globularia orientalis L.

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2628. Ir.-Tur. element.

G. trichosantha Fisch. & C.A.Mey.

B3 Afyon: Sincanlı, south-east of Tazlar village, grassy slopes, 1500 m, 01 vi 1997, Kargioğlu 2377.

VERBENACEAE

Verbena officinalis L.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya streamsides, 1400 m, 22 vii 1997, Kargioğlu 2455.

LABIATAE (LAMIACEAE)

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

B3 Afyon: Sincanlı, south-east of Tazlar village, fallow fields, 1500 m, 01 vi 1997, Kargioğlu 2378.

Subsp. *mesogitana* (Boiss.) Bornm.

B3 Afyon: Sincanlı, around Çobanözü village, rock slopes, 1400-1450 m, 12 vi 1996, Kargioğlu 2067. E. Medit. (mt.) element.

A. bombycina Boiss.

B3 Afyon: Sincanlı, around Çobanözü village, rock slopes, 1350 m, 25 v 1996, Kargioğlu 2051. Endemic, E. Medit. element. "LR (nt)"

Teucrium orientale L. var. *glabrescens* Hausskn. ex Bornm.

B3 Afyon: Sincanlı, south of Çobanözü village, clearings of *Pinus nigra* forest, 1500 m, 14 ix 1997, Kargioğlu 2468. Ir.-Tur. element.

T. scordium L. subsp. *scordium*

B3 Afyon: Sincanlı, Çobanözü village, around Tahtalık stream, clearings of *Pinus nigra* forest, moist places, 1600 m, 14 ix 1997, Kargioğlu 2483. Euro-Sib. element.

T. chamaedrys L. subsp. *chamaedrys*

B3 Afyon: Sincanlı, Tazlar village, Yellice hill, rocky places, 1500 m, 28 vi 1997, Kargioğlu 2406. Euro-Sib. element.

T. chamaedrys L. subsp. *tauricolum* Rech.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya streamsides, 1400 m, 26 vii 1996, Kargioğlu 2253. Endemic, E. Medit. element. "LR (lc)"

T. chamaedrys L. subsp. *sypsiense* (K.Koch) Rech.

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1650 m, 26 vii 1996, Kargioğlu 2268. Ir.-Tur. element.

Scutellaria albida L. subsp. *albida*

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1450 m, 04 ix 1996, Kargioğlu 2303. E. Medit. element.

Phlomis armeniaca Willd.

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1800 m, 16 vii 1998, Kargioğlu 2739. Endemic, Ir.-Tur. element. "LR (lc)"

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

B3 Afyon: Sincanlı, Ahırdağı, around Tahtalık stream, shady banks, 1700 m, 31 v 1998, Kargioğlu 2512.

L. amplexicaule L.

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1750 m, 03 vii 1996, Kargioğlu 2172. Euro-Sib. element.

L. purpureum L. var. **purpureum**

B3 Afyon: Sincanlı, south-east of Tazlar village, waste places, 1500 m, 01 vi 1997, Kargioğlu 2379. Euro-Sib. element.

L. moschatum Mill. var. **moschatum**

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, rocky slopes, 1700 m, 31 v 1998, Kargioğlu 2513. E. Medit. element.

Wiedemannia orientalis Fisch. & C.A.Mey.

B3 Afyon: Hocalar, east of Yağcı village, fields, 1200 m, 13 vi 1998, Kargioğlu 2605.

Endemic, Ir.-Tur. element. "LR (lc)"

Marrubium anisodon K.Koch

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1800 m, 16 vii 1998, Kargioğlu 2737.

M. astracanicum Jacq. subsp. **macrodon** (Bornm.) P.H.Davis

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1800 m, 16 vii 1998, Kargioğlu 2738. Endemic. "LR (lc)"

Sideritis montana L. subsp. **montana**

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2630. Medit. element.

S. montana L. subsp. **remota** (d'Urv.) P.W.Ball ex Heywood

B3 Afyon: Sincanlı, Yürükmezarı village, fallow fields, 1400 m, 21 vi 1996, Kargioğlu 2097. E. Medit. element.

Stachys tmolea Boiss.

B3 Afyon: Sincanlı, Tazlar village, Yellice hill, rocky places, 1500 m, 28 vi 1997, Kargioğlu 2405. Endemic, E. Medit. element. "LR (lc)"

S. cretica L. subsp. **anatolica** Rech.

B3 Afyon: Hocalar, Yağcı village, roadsides, 1550 m, 03 vii 1996, Kargioğlu 2159.

Endemic, Ir.-Tur. element. "LR (lc)"

S. byzantina K.Koch

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya streamsides, 1400 m, 26 vii 1996, Kargioğlu 2271. Euro-Sib. element.

S. iberica M.Bieb. subsp. **iberica** var. **iberica**

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, stony slopes, 1900 m, 28 vi 1997, Kargioğlu 2430. Ir.-Tur. element.

Subsp. **iberica** var. **densipilosa** R.Bhattacharjee

B3 Afyon: Sincanlı, Tazlar village, Yellice hill, rocky places, 1500 m, 28 vi 1997, Kargioğlu 2404. Endemic, Ir.-Tur. element. "LR (lc)"

S. annua (L.) L. subsp. **annua** var. **lycaonica** R.Bhattacharjee

B3 Afyon: Hocalar, west of Yağcı village, clearings of *Cistus laurifolius* shrubs, 1200 m, 13 vi 1998, Kargioğlu 2580. Ir.-Tur. element.

Nepeta nuda L. subsp. **albiflora** (Boiss.) Gams

B3 Afyon: Sincanlı, Kınık village, Karata? hill, clearings of *Quercus cerris* forest, 1310 m, 14 vii 1998, Kargioğlu 2693.

Prunella vulgaris L.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya stream banks, 1400 m, 26 vii 1996, Kargioğlu 2251. Euro-Sib. element.

P. laciniata (L.) L.

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1650 m, 16 vii 1998, Kargioğlu 2768. Euro-Sib. element.

Origanum sipyleum L.

B3 Afyon: Sincanlı, Çobanözü village, around Tahtalık stream, clearings of *Pinus nigra* forest, 1500 m, 14 ix 1997, Kargioğlu 2480. Endemic, E. Medit. element. "LR (lc)"

O. vulgare L. subsp. **hirtum** (Link) Letsw.

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, rocky slopes, 1700 m, 08 v 1996, Kargioğlu 2010. E. Medit. element.

Calamintha grandiflora (L.) Moench

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1650 m, 16 vii 1998, Kargioğlu 2767. Euro-Sib. element.

Clinopodium vulgare L. subsp. **vulgare**

B3 Afyon: Hocalar, Yağcı village, around Karagöl, clearings of *Pinus nigra* forest, 1400 m, 22 vii 1997, Kargioğlu 2447.

Acinos rotundifolius Pers.

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1800 m, 16 vii 1998, Kargioğlu 2736.

Micromeria cristata (Hampe) Griseb. subsp. **phrygia** P.H.Davis

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, on limestone rock and cliff, 1650 m, 22 vii 1997, Kargioğlu 2462. Endemic, E. Medit. (mt.) element. "LR (lc)"

Thymus zygoides Griseb. var. **lycaonicus** (Celak.) Ronniger

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1650 m, 22 vii 1997, Kargioğlu 2463.

Endemic, E. Medit. element. "LR (lc)"

T. sipyleus Boiss. subsp. **sipyleus** var. **sipyleus**

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1800 m, 16 vii 1998, Kargioğlu 2741. Endemic. "LR (lc)"

T. longicaulis C.Presl subsp. **longicaulis** var. **subisophyllus** (Borbas) Jalas

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, rocky slopes, 1800 m, 16 vii 1998, Kargioğlu 2740.

Subsp. **chaubardii** (Boiss. & Heldr. ex Reichb.) Jalas var. **alternatus** Jalas

B3 Afyon: Sincanlı, Güvercinlik hill, clearings of *Pinus nigra*-*Populus tremula* community, 1560 m, 15 vii 1998, Kargioğlu 2711.

Subsp. **chaubardii** (Boiss. & Heldr. ex Reichb.) Jalas var. **antalyanus** (Klokov) Jalas

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1650 m, 26 vii 1996, Kargioğlu 2269. Endemic. "LR (nt)"

Mentha aquatica L.

B3 Afyon: Sincanlı, around Çayhisar village, damp banks, 1100 m, 26 vii 1996, Kargioğlu 2273.

M. longifolia (L.) Huds. subsp. *longifolia*

B3 Afyon: Sincanlı, Yürükmezari village, around Küppınarı, wet places, 1650 m, 04 ix 1996, Kargioğlu 2284.

Subsp. *typhoides* (Briq.) Harley var. *typhoides*

B3 Afyon: Sincanlı, Yürükmezari village, Merdivenkaya streamsides, 1400 m, 26 vii 1996, Kargioğlu 2250.

Lycopus europaeus L.

B3 Afyon: Sincanlı, Yürükmezari village, Merdivenkaya streamsides, 1400 m, 26 vii 1996, Kargioğlu 2249. Euro-Sib. element.

Ziziphora tenuior L.

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1800 m, 16 vii 1998, Kargioğlu 2743. Ir.-Tur. element.

Z. taurica M.Bieb. subsp. *cleonioides* (Boiss.) P.H.Davis

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2631. Endemic, E. Medit. element. "LR (cd)"

Salvia tomentosa Mill.

B3 Afyon: Sincanlı, Güvercinlik hill, clearings of *Pinus nigra*-*Populus tremula* community, 1600 m, 10 vii 1996, Kargioğlu 2236. Medit. element.

S. cadmica Boiss.

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1700 m, 31 v 1997, Kargioğlu 2345. Endemic. "LR (lc)"

S. sclarea L.

B3 Afyon: Sincanlı, Yürükmezari village, Merdivenkaya streamsides, 1400 m, 26 vii 1996, Kargioğlu 2252.

S. ceratophylla L.

B3 Afyon: Sincanlı, south-east of Tazlar village, fallow fields, 1750 m, 25 v 1996, Kargioğlu 2038. Ir.-Tur. element.

S. virgata Jacq.

B3 Afyon: Hocalar, Aletdüzen farm, roadsides 1300 m, 16 vii 1998, Kargioğlu 2725.

Ir.-Tur. element.

PLUMBAGINACEAE

Acantholimon acerosum (Willd.) Boiss. var. *acerosum*

B3 Afyon: Sincanlı, Çobanözü village, around Tahtalık stream, clearings of *Pinus nigra* forest, 1360 m, 16 vii 1998, Kargioğlu 2721. Ir.-Tur. element.

A. puberulum Boiss. & Bal. var. *puberulum*

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, with *Astragalus microcephalus*, 1650 m, 26 vii 1996, Kargioğlu 2270. Ir.-Tur. element.

A. ulicinum (Willd. ex Schult.) Boiss. var. *ulicinum*

B3 Afyon: Sincanlı, Çobanözü village, around Tahtalık stream, clearings of *Pinus nigra* forest, 1360 m, 16 vii 1998, Kargioğlu 2727.

PLANTAGINACEAE

Plantago major L. subsp. *intermedia* (Gilib.) Lange

B3 Afyon: Sincanlı, around Kırka town, damp meadow, 1300 m, 05 vii 1996, Kargioğlu 2203.

P. holosteam Scop.

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1800 m, 22 vii 1997, Kargioğlu 2467. Medit. element.

P. lanceolata L.

B3 Afyon: Sincanlı, Yürükmezari village, Merdivenkaya streamsides, 1800 m, 16 vii 1998, Kargioğlu 2744.

P. lagopus L.

B3 Afyon: Sincanlı, Çobanözü village, damp meadows, 1450 m, 12 vi 1996, Kargioğlu 2068. Medit. element.

THYMELAEACEAE

Thymelaea passerina (L.) Coss. & Germ.

B3 Afyon: Sincanlı, Yürükmezari village, Merdivenkaya stream banks, 1400 m, 12 vi 1996, Kargioğlu 2071.

LORANTHACEAE

Viscum album L. subsp. *album*

B3 Afyon: Sincanlı, around Tazlar village, on *Pinus nigra*, 1400 m, 27 viii 2000, Kargioğlu 2809.

ARISTOLOCHIACEAE

Aristolochia pallida Willd.

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, rocky slopes, 1750 m, 31 v 1998, Kargioğlu 2517.

EUPHORBIACEAE

Euphorbia stricta L.

B3 Afyon: Sincanlı, Yürükmezari village, Merdivenkaya stream banks, 1500 m, 21 vi 1996, Kargioğlu 2091. Euro-Sib. element.

E. falcata L. subsp. *falcata* var. *falcata*

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2618.

E. anacampseros Boiss. var. *anacampseros*

B3 Afyon: Sincanlı, Yürükmezari village, Merdivenkaya stream banks, 1400 m, 21 vi 1996, Kargioğlu 2090. Endemic. "LR (lc)"

E. macroclada Boiss.

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1650 m, 16 vii 1998, Kargioğlu 2757. Ir.-Tur. element.

E. seguieriana Neck. subsp. *seguieriana*

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1800 m, 16 vii 1998, Kargioğlu 2732. Euro-Sib. element.

URTICACEAE

Urtica dioica L.

B3 Afyon: Sincanlı, Yürükmezari village, Merdivenkaya streamsides, 1400 m, 03 vii 1996, Kargioğlu 2151. Euro-Sib. element.

ULMACEAE

Ulmus glabra Huds.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya streamsides, 1400 m, 26 vii 1996, Kargioğlu 2256. Euro-Sib. element.

JUGLANDACEAE

**Juglans regia* L.

B3 Afyon: Sincanlı, Yürükmezarı village, garden, 1400 m, 27 viii 2000, Kargioğlu 2808.

FAGACEAE

Quercus vulcanica (Boiss. & Heldr. ex Kotschy

B3 Afyon: Sincanlı, around Çayhisar village, with *Quercus cerris*, 1380 m, 16 vii 1998, Kargioğlu 2780. Endemic, E. Medit. (mt.) element. "LR (nt)"

Q. cerris L. var. *cerris*

B3 Afyon: Sincanlı, around Çayhisar village, 1380 m, 16 vii 1998, Kargioğlu 2779.

Medit. element.

Q. ithaburensis Decne. subsp. *macrolepis* (Kotschy) Hedge & Yalt.

B2 Afyon: Around Hocalar, south slopes, with *Pinus brutia*, 900 m, 14 vi 1998, Kargioğlu 2627. E. Medit. element.

CORYLACEAE

Corylus colurna L.

B3 Afyon: Hocalar, Yağcı village, north of Fındıklı hill, rocky slopes, 1250 m, 31 v 1998, Kargioğlu 2541. Euro-Sib. element.

C. avellana L. var. *avellana*

B3 Afyon: Sincanlı, Tazlar village, Yellice hill, rocky places, 1500 m, 28 vi 1997, Kargioğlu 2401. Euro-Sib. element.

SALICACEAE

Salix alba L.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya streamsides, 1500 m, 31 v 1997, Kargioğlu 2362. Euro-Sib. element.

Populus tremula L.

B3 Afyon: Sincanlı, around Karapınar, mixed *Pinus nigra*, 1600 m, 22 vi 1996, Kargioğlu 2142. Euro-Sib. element.

RUBIACEAE

Crucianella latifolia L.

B3 Afyon: Sincanlı, Yürükmezarı village, Karapınar district, grassy places 1650 m, 03 vii 2000, Kargioğlu 2795. Medit. element.

Asperula lilaciflora Boiss. subsp. *phrygia* (Bornm.) Schönb.-Tem.

B3 Afyon: Sincanlı, Yürükmezarı village, around Küppınarı, stony slopes, 1400 m, 14 ix 1997, Kargioğlu 2492. Endemic. "LR (lc)"

A. involucrata Wahlenb.

B3 Afyon: Sincanlı, Çayhisar village, clearings of *Quercus cerris* forest, 1250 m, 31 v 1997, Kargioğlu 2347. Euxine element.

A. arvensis L.

B3 Afyon: Hocalar, around Yağcı village, fields, 1200 m, 13 vi 1998, Kargioğlu 2583.

Medit. element.

Galium verum L. subsp. *verum*

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, waste places, 1550 m, 10 vii 1996, Kargioğlu 2230. Euro-Sib. element.

G. incanum Sm. subsp. *elatius* (Boiss.) Ehrend.

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1800 m, 16 vii 1998, Kargioğlu 2745. Ir-Tur. element.

G. spurium L. subsp. *spurium*

B3 Afyon: Hocalar, Yağcı village, waste places, 1400 m, 13 vi 1998, Kargioğlu 2555.

Euro-Sib. element.

G. aparine L.

B3 Afyon: Sincanlı, Yürükmezarı village, cultivated ground, 1400-1500 m, 21 vi 1996, Kargioğlu 2104.

G. tricornutum Dandy

B3 Afyon: Sincanlı, field and roadsides, 1200 m, 13 vi 1998, Kargioğlu 2602.

Medit. element.

G. peplidifolium Boiss.

B3 Afyon: Sincanlı, Kınık village, Karata? hill, clearings of *Quercus cerris* forest, 1310 m, 14 vii 1998, Kargioğlu 2697. E. Medit. element.

G. floribundum Sm. subsp. *floribundum*

B3 Afyon: Sincanlı, Kırka town, Koru hill, clearings of *Cistus laurifolius* shrubs, 1380 m, 28 vi 1998, Kargioğlu 2675.

G. verticillatum Danthoine ex Lam.

B3 Afyon: Sincanlı, Kırka town, Koru hill, stony slopes, 1380 m, 28 vi 1998, Kargioğlu 2676. Medit. element.

Callipeltis cucullaria (L.) Steven

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2642. Ir.-Tur. element.

MONOCOTYLEDONES

LEMNACEAE

Lemna trisulca L.

B3 Afyon: Hocalar, west of Yağcı village, salmon production farm, on ponds 1200 m, 13 vi 1998, Kargioğlu 2588.

LILIACEAE

Polygonatum orientale Desf.

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, rocky slopes, 1750 m, 31 v 1998, Kargioğlu 2523. Euxine element.

Asphodeline lutea (L.) Rchb.

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, rocky slopes, 1800 m, 14 vi 1998, Kargioğlu 2650. Medit. element.

Allium paniculatum L. subsp. *paniculatum*

B3 Afyon: Sincanlı, Karapınar district, clearings of *Pinus nigra* forest, 1650 m, 03 vii 2000, Kargioğlu 2798. Medit. element.

A. stamineum Boiss.

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1650 m, 16 vii 1998, Kargioğlu 2773. E. Medit. element.

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

B3 Afyon: Sincanlı, Yürükmezari village, Merdivenkaya streamsides, 1400 m, 03 vii 1996, Kargioğlu 2156. *Medit. element.*

A. guttatum Steven subsp. **sardoum** (Moris) Stearn

B3 Afyon: Sincanlı, Güvercinlik hill, clearings of *Pinus nigra*-*Populus tremula* community, 1560 m, 15 vii 1998, Kargioğlu 2709. *Medit. element.*

Scilla bifolia L.

B3 Afyon: Sincanlı, Yürükmezari village, Karapınar district, clearings of *Pinus nigra* forest, 1650 m, 01 v 1997, Kargioğlu 2329. *Medit. element.*

S. autumnalis L.

B3 Afyon: Sincanlı, Tazlar village, clearings of *Pinus nigra* forest, 1400 m, 27 viii 2000, Kargioğlu 2815. *Medit. element.*

Ornithogalum oligophyllum E.D.Clarke

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, stony slopes, 1700 m, 08 v 1996, Kargioğlu 2014.

O. montanum Cyr.

B3 Afyon: Hocalar, west of Yağcı village, clearings of *Cistus laurifolius* shrubs, 1200 m, 13 vi 1998, Kargioğlu 2591. *E. Medit. element.*

O. plathyphyllum Boiss.

B3 Afyon: Sincanlı, Yürükmezari village, Çataloluk district, damp places, 1450 m, 21 vi 1996, Kargioğlu 2106. *Ir.-Tur. element.*

O. armeniacum Baker

B3 Afyon: Sincanlı, Yürükmezari village, Çataloluk district, clearings of *Pinus nigra* forest, 1700 m, 12 vi 1996, Kargioğlu 2082. *E. Medit. element.*

O. nutans L.

B3 Afyon: Sincanlı, Yürükmezari village, Karapınar district, meadows, 1600 m, 01 vi 1997, Kargioğlu 2394. *E. Medit. element.*

Muscari comosum (L.) Mill.

B3 Afyon: Hocalar, west of Yağcı village, clearings of *Cistus laurifolius* shrubs, 1200 m, 13 vi 1998, Kargioğlu 2590. *Medit. element.*

M. tenuiflorum Tausch

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, rocky slopes, 1750 m, 31 v 1998, Kargioğlu 2521.

M. neglectum Guss.

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, rocky slopes, 1900 m, 25 v 1996, Kargioğlu 2053.

Fritillaria pinardii Boiss.

B3 Afyon: Sincanlı, Ahırdağı, Ardıçlı hill, rocky slopes, 1600 m, 08 v 1996, Kargioğlu 2012. *Ir.-Tur. element.*

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

B3 Afyon: Sincanlı, Yürükmezari village, Çataloluk district, clearings of *Pinus nigra* forest, 1650 m, 04 v 1997, Kargioğlu 2333.

G. foliosa (J. & C. Presl) Schult. & Schult.f.

B3 Afyon: Sincanlı, Yürükmezari village, Karapınar district, clearings of *Pinus nigra* forest, 1650 m, 01 v 1997, Kargioğlu 2328.

G. granatellii (Parl.) Parl.

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, stony slopes, 1800 m, 14 iv 1996, Kargioğlu 2004. *Medit. element.*

Colchicum triphyllum Kunze

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, stony slopes, 1800 m, 14 iv 1996, Kargioğlu 2002. *Medit. element.*

C. burtii Meikle

B3 Afyon: Sincanlı, Güvercinlik hill, stony slopes, 1550 m, 15 vii 1998, Kargioğlu 2716. *Endemic, E. Medit. element. "LR (lc)"*

Merendera attica (Spruner) Boiss. & Spruner

B3 Afyon: Sincanlı, around Çataloluk, clearings of *Pinus nigra* forest, 1550 m, 09 iii 1997, Kargioğlu 2317. *E. Medit. element.*

AMARYLLIDACEAE

Galanthus gracilis Celak.

B3 Afyon: Hocalar, Yağcı village, north of Fındıklı hill, rocky slopes, 1250 m, 18 iv 1998, Kargioğlu 2496. *E. Medit. element.*

IRIDACEAE

Crocus chrysanthus (Herb.) Herb.

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1500 m, 09 iii 1997, Kargioğlu 2314.

C. biflorus Mill. subsp. **isauricus** (Siehe ex Bowles) B.Mathew

B3 Afyon: Sincanlı, Yürükmezari village, Karapınar district, clearings of *Pinus nigra* forest, 1650 m, 01 v 1997, Kargioğlu 2330.

Endemic, E. Medit. element. "LR (lc)"

C. flavus Weston subsp. **dissectus** T.Baytop & B.Mathew

B3 Afyon: Sincanlı, Çobanözü village, around Tahtalık stream, clearings in *Pinus nigra*, 1300 m, 18 iv 1988, Kargioğlu 2500.

Endemic. "VU"

C. pallasi Goldb. subsp. **dispathaceus** (Bowles) B.Mathew

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, stony places, 1800 m, 01 xi 1996, Kargioğlu 2310.

ORCHIDACEAE

Cephalanthera rubra (L.) Rich.

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1650 m, 16 vii 1998, Kargioğlu 2774.

C. damasonium (Mill.) Druce

B3 Afyon: Hocalar, north-east of Yağcı village, Ortadere district, clearings of *Cistus laurifolius* shrubs, 1300 m, 28 vi 1998, Kargioğlu 2668. *Euro-Sib. element.*

Epipactis helleborine (L.) Crantz

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1650 m, 16 vii 1998, Kargioğlu 2775.

Limodorum abortivum (L.) Sw.

B3 Afyon: Hocalar, north-east of Yağcı village, Ortadere district, clearings of *Cistus laurifolius* shrubs, 1300 m, 28 vi 1998, Kargioğlu 2669.

Orchis mascula (L.) L. subsp. **pinetorum** (Boiss. & Kotschy) Camus

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1550 m, 25 v 1996, Kargioğlu 2050. *E. Medit. element.*

O. pallens L.

B3 Afyon: Sincanlı, Yürükmezari village, clearings of *Pinus nigra* forest, 1450 m, 12 vi 1996, Kargioğlu 2079. *Euro-Sib. element.*

O. palustris Jacq.

B3 Afyon: Sincanlı, Yürükmezarı village, around Küppınarı, moist meadows, 1700 m, 14 ix 1997, Kargioğlu 2494.

Dactylorhiza iberica (M.Bieb. ex Willd.) Soo

B3 Afyon: Sincanlı, Yürükmezarı village, Karapınar district, moist meadows, 1650 m, 03 vii 2000, Kargioğlu 2799. E. Medit. element.

TYPHACEAE

Typha angustifolia L.

B3 Afyon: Hocalar, Yağcı village, Karagöl, 1350 m, 13 vi 1998, Kargioğlu 2558.

JUNACEAE

Juncus inflexus L.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya streamsides, 1400 m, 03 vii 1996, Kargioğlu 2155.

Luzula forsteri (Sm.) DC.

B3 Afyon: Sincanlı, Güvercinlik hill, clearings of *Pinus nigra*-*Populus tremula* community, 1560 m, 15 vii 1998, Kargioğlu 2715. Euro-Sib. element.

CYPERACEAE

Schoenoplectus lacustris (L.) Palla subsp. *lacustris*

B3 Afyon: Sincanlı, Çobanözü village, around Tahtalık stream, clearings of *Pinus nigra* forest, dry pool beds, 1600 m, 14 ix 1997, Kargioğlu 2477.

Scirpoides holoschoenus (L.) Sojak

B3 Afyon: Sincanlı, Kırka town, wet meadows, 1300 m, 15 vii 2000, Kargioğlu 2797.

Carex panicea L.

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1650 m, 16 vii 1998, Kargioğlu 2771.

POACEAE (GRAMINEAE)

Brachypodium sylvaticum (Huds.) P. Beauv.

B3 Afyon: Hocalar, west of Yağcı village, clearings of *Cistus laurifolius* shrubs, 1200 m, 13 vi 1998, Kargioğlu 2587. Euro-Sib. element.

Aegilops umbellulata Zhuk. subsp. *umbellulata*

B3 Afyon: Hocalar, west of Yağcı village, clearings of *Cistus laurifolius* shrubs, 1200 m, 13 vi 1998, Kargioğlu 2586. Ir.-Tur. element.

Ae. triuncialis L. subsp. *triuncialis*

B3 Afyon: Hocalar, west of Yağcı village, fallow fields, 1200 m, 13 vi 1998, Kargioğlu 2585.

Hordeum murinum L. subsp. *glaucum* (Steud.) Tzvelev

B3 Afyon: Sincanlı, around Kınık village, cultivated fields, 1310 m, 14 vii 1998, Kargioğlu 2700.

H. bulbosum L.

B3 Afyon: Sincanlı, Ahırdağı, Asar hill, clearings of *Pinus nigra* forest, 1450 m, 16 vii 1998, Kargioğlu 2772.

Taeniatherum caput-medusae (L.) Nevski subsp. *crinitum* (Schreb.) Melderis

B3 Afyon: Hocalar, west of Yağcı village, clearings of *Cistus laurifolius* shrubs, 1200 m, 13 vi 1998, Kargioğlu 2589. Ir.-Tur. element.

Bromus japonicus Thunb. subsp. *japonicus*

B3 Afyon: Sincanlı, Çayhisar village, field margins, 1200 m, 03 vii 1996, Kargioğlu 2188.

B. squarrosus L.

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1800 m, 16 vii 1998, Kargioğlu 2749.

B. scoparius L.

B3 Afyon: Hocalar, Yağcı village, cultivated fields, 1200 m, 13 vi 1998, Kargioğlu 2549.

B. tectorum L.

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1700 m, 16 vii 1998, Kargioğlu 2750.

B. sterilis L.

B3 Afyon: Sincanlı, around Kırka town, moist meadows, 1300 m, 05 vii 1996, Kargioğlu 2206.

B. tomentellus Boiss.

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1750 m, 03 vii 1996, Kargioğlu 2173. Ir.-Tur. element.

Avena fatua L. var. *fatua*

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya streamsides, 1400 m, 21 vi 1996, Kargioğlu 2108.

Arrhenatherum elatius (L.) P.Beauv. ex J. & C.Presl subsp. *elatius*

B3 Afyon: Sincanlı, Kınık village, Karata? hill, clearings of *Quercus cerris* forest, 1310 m, 14 vii 1998, Kargioğlu 2699. Euro-Sib. element.

Calamagrostis pseudophragmites (Haller f.) Koeler

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya stream banks, 1400 m, 03 vii 1996, Kargioğlu 2154. Euro-Sib. element.

Apera intermedia Hack.

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, field margins, 1500 m, 03 vii 1996, Kargioğlu 2187. Ir.-Tur. element.

Alopecurus arundinaceus Poir.

B3 Afyon: Sincanlı, Yürükmezarı village, Karapınar district, wet meadows, 1700 m, 03 vii 2000, Kargioğlu 2796. Euro-Sib. element.

Phleum montanum K.Koch subsp. *serrulatum* (Boiss.) Dogan

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1750 m, 03 vii 1996, Kargioğlu 2176. E. Medit. element.

P. phleoides (L.) H.Karst.

B3 Afyon: Sincanlı, Kartalpınarı district, *Astragalus* steppe, 1700 m, 03 vii 1996, Kargioğlu 2197. Euro-Sib. element.

P. exaratum Hochst. ex Griseb. subsp. *exaratum*

B3 Afyon: Sincanlı, Yürükmezarı village, Çataloluk district, field margins, 1500 m, 03 vii 1996, Kargioğlu 2189.

Festuca valesiaca Schleich. ex Gaudin

B3 Afyon: Sincanlı, Ahırdağı, Büyükkavuşak hill, in *Astragalus microcephalus* steppe, 1750 m, 03 vii 1996, Kargioğlu 2174.

Poa pratensis L.

B3 Afyon: Sincanlı, Yürükmezarı village, clearings of *Pinus nigra* forest, 1400 m, 21 vi 1996, Kargioğlu 2124.

P. nemoralis L.

B3 Afyon: Sincanlı, Karapınar district, moist meadows, 1700 m, 16 vii 1998, Kargioğlu 2751.

P. bulbosa L.

B3 Afyon: Sincanlı, Kartalpınarı district, *Astragalus* steppe, 1700 m, 03 vii 1996, Kargioğlu 2196.

Nephelochloa orientalis Boiss.

B3 Afyon: 3.2 km from Sincanlı to Dumlupınar, 1200 m, Coode & Jones 2347!

Endemic, E. Medit. element. "VU"

Catabrosa aquatica (L.) P.Beauv.

B3 Afyon: Hocalar, Yağcı village, around Karagöl, clearings of *Pinus nigra* forest, water meadows, 1500 m, 13 vi 1998, Kargioğlu 2550.

Dactylis glomerata L. subsp. *hispanica* (Roth) Nyman

B3 Afyon: Sincanlı, Yürükmezarı village, clearings of *Pinus nigra* forest, 1500 m, 21 vi 1996, Kargioğlu 2109.

Cynosurus cristatus L.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya streamsides, moist meadows, 1600 m, 22 vii 1997, Kargioğlu 2464. Euro-Sib. element.

Briza media L.

B3 Afyon: Sincanlı, Yürükmezarı village, Merdivenkaya streamsides, 1500 m, 03 vii 1996, Kargioğlu 2153.

B. humilis M.Bieb.

B2 Afyon: Around Hocalar, south slopes, clearings of *Pinus brutia* forest, 900 m, 14 vi 1998, Kargioğlu 2646.

Stipa holosericea Trin.

B3 Afyon: Sincanlı, Kartalpınarı district, *Astragalus* steppe, 1700 m, 03 vii 1996, Kargioğlu 2198. Ir.-Tur. element.

Phragmites australis (Cav.) Trin. ex Steud.

B2 Afyon: Hocalar, Yağcı village, Karagöl, 1350 m, 13 vi 1998, Kargioğlu 2557.

Euro-Sib. element.

Setaria viridis (L.) P.Beauv.

B3 Afyon: Sincanlı, Yürükmezarı village, Karapınar district, moist meadows, 1650 m, 03 vii 2000, Kargioğlu 2797.