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Subalpine and Alpine Flora of Altındere Valley (Maçka, Trabzon)

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Abstract: The subalpine and alpine flora of Altındere Valley (Maçka, Trabzon) was investigated during 2000-2002. The study area is situated in the Colchis sector of the Euro-Siberian floristic area of the Holarctic region with regard to plant geography. In this area, 384 plant taxa belonging to 61 families and 190 genera were determined. The largest family is *Asteraceae* (39; 10%), and the second largest is *Rosaceae* (35; 9%). The rates of the taxa belonging to certain phytogeographical regions are as follows: 50.27% Euro-Siberian, 5.99% Irano-Turanian and 1.04% Mediterranean. Moreover, phytogeographically unknown taxa are 42.70%. Thirty-two endemic (8.3%) and 9 rare (2.3%) taxa were determined in the study area. Endemic and rare plants were classified according to IUCN threat categories.

Key Words: Flora, Subalpine, Alpine, Trabzon, Altındere Valley

Altındere Vadisi (Maçka-Trabzon) Subalpin ve Alpin Florası

Özet: Bu çalışmada, 2000-2002 yılları arasında Maçka (Trabzon) Altındere Vadisi'nin subalpin ve alpin florası araştırılmıştır. Çalışma alanı, bitki coğrafyası yönünden; Holarktik Bölgenin Avrupa-Sibirya Flora alanının Kolşik (Colchis) kesiminde kalmaktadır. Çalışma alanında, 61 familya ve 190 cinsine ait toplam 384 bitki taksonu saptanmıştır. Çalışma alanında içerdiği tür sayısına göre en büyük familya *Asteraceae* (39; %10), ikincisi ise *Rosaceae*'dir (35; %9). Türlerin fitocoğrafik bölgelere göre dağılımı şöyledir: %50,27'si Avrupa-Sibirya elementi, %5,99'u İran-Turan elementi ve %1,04'ü Akdeniz elementidir. Ayrıca taksonların %42,70'inin fitocoğrafik bölgesi bilinmemektedir. Çalışma alanında 32 adet endemik (%8,3) ve 9 adet nadir (%2,3) bitki taksonu saptanmıştır. Alanda saptanan endemik ve nadir bitkilerin IUCN tehlike kategorilerine göre durumları belirtilmiştir.

Anahtar Sözcükler: Flora, Alpin, Subalpin, Trabzon, Altındere Vadisi

Introduction

The aim of this study was to determine the subalpine and alpine flora as well as the endemic and rare plant taxa of Altındere Valley, situated in the Eastern Black Sea region of the Euro-Siberian floristic area. It is a part of Trabzon province popular with tourists because this area is a national park and includes Sumela (Meryemana) Monastery, which is an important spiritual tourism site.

The study area is in the A7 Trabzon and A7 Gümü?hane square according to Davis's (1971) grid system. The altitude of the study area varies from 1600 to 3063 m. The area is situated at latitude 40° 43' 30" - 40° 32' 00" N and longitude 39° 44' 30" -39° 37' 30" and covers about 8851 ha.

The study area, comprising subalpine bushes and alpine meadows, is bounded by Karaağaç, İspendamos and İskobel Yaylas to the north, and Deveboynu ridge (2717 m), İskoper hill (2720 m) and Çakırgöl Mountain (3063 m) the highest part of the study area to the south. Furthermore, a crater lake, which is the fountain-head of the Meryemana stream, is situated on the lower slopes of Çakırgöl Mountain.

There is no meteorological station in the study area. Therefore, temperature (°C) and rainfall (mm) averages were obtained from the nearest meteorological stations and estimated by interpolation. The annual average rainfall is 1429 mm and the average temperature is 6.4 °C in the area. The climate type of the area is very humid (Çepel, 1995).

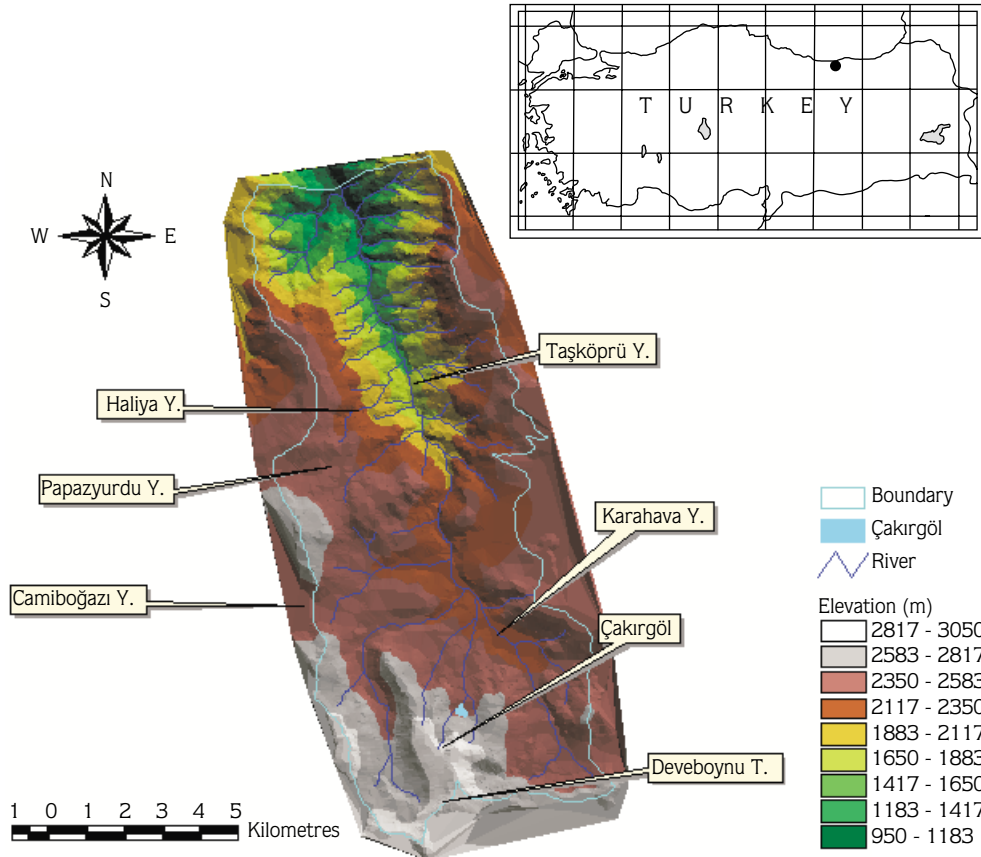


Figure 1. Study area.

The study area is located in the Northern Zone of the Eastern Pontides. Seven different formations crop out in the study area. These are from low altitude to summit:

- Hamurkesen Formation
- Berdiga Formation
- Mescitli Formation
- Çatak Formation
- Çağlayan Formation
- Alibaba Formation
- Kaçkar Granitoid I (MTAGM, 1997)

The Eastern Black Sea region has 8 major soil groups; the study area is in the Podzolic soil group (TGM, 1981).

The soil structure of the study area changes depending on elevation. The area has grey-brown podzolic soil between 1600 and 1750 m and high mountain meadow soils between 1750 and 2000 m (Öztan, 1980).

Materials and Methods

Research materials were collected during 2000-2002, between March and October in each year. One thousand one hundred plant specimens, which had different appearances during different vegetation periods, were collected. Efforts were made to collect both flowering and fruiting specimens. The plant samples were prepared according to established herbarium techniques. The *Flora of Turkey and the East Aegean Islands* (Davis 1965-85; Davis et al., 1988; Güner et al., 2000) was used as a main source for the identification of the plant specimens. 'Trabzon-Meryemana Araştırma Ormanı Florası ve Saf Ladin Meşcerelerinde Floristik Araştırmalar' (Anşin, 1979), *Flora USSR* (Komarov, 1934-78), plant atlases with illustrations and photographs (Bonnier, 1912-1934; Clapham et al., 1965; Polunin, 1969; Hegi et al., 1977; Godet, 1991; Wright, 1992; Phillips, 1994; Lanzara et al., 1997; Fitter & Blamey, 2000), and plant dictionaries (Harrington, 1957; Davis & Cullen, 1989; Baytop, 1998) were also used. These identifications were carried out in

the Herbarium of the Forestry Faculty (KATO), Karadeniz Technical University, Trabzon. All plant samples are kept in KATO.

The flora is listed in the appendix. The list of plants is presented according to the sequence given in the *Flora of Turkey* (Davis, 1965-85; Davis et al., 1988). Since the whole research area was situated within the A7 grid square, this information was not repeated after the taxon names. After the name of every species in the floristic list, the geographical location, habitat of plant, altitude, collection date, herbarium record number, collector name and number, endemism, IUCN threat categories, and phytogeographical region are given. Abbreviations of the authors of plant names are given according to Brummitt & Powell (1992). The endemic and rare non-endemic plants in the study area are classified according to IUCN threat categories (Ekim et al., 2000).

Abbreviations

The abbreviations used in the text and in the floristic list are as follows: Cosm: Cosmopolitan, DD: Data Deficient, EN: Endangered, Euro-Sib. el.: Euro-Siberian element, Eux. el.: Euxine element, Hyr-Eux. el.: Hyrcano-Euxine element, Ir-Tur. el.: Irano-Turanian element, LR: Lower Risk, (lc: least concern, cd: conservation dependent, nt: near threatened), m: metre, Medit. el.: Mediterranean element, mt: mountain, SP: Seyran Palabaş, V: Valley, VU: Vulnerable, and Y: Yaylası.

Results and Discussion

A total of 384 taxa from 61 families and 190 genera were identified. Of these, 373 belonged to

Spermatophyta, which included 3 taxa from the *Gymnospermae* and 370 taxa from the *Angiospermae*, and the remaining 11 taxa belonged to *Pteridophyta*. The *Angiospermae* also included 301 taxa from the *Magnoliopsida* and 69 taxa from the *Liliopsida*. The dispersion of the plant taxa that were defined in the study area according to the large taxonomical groups is shown in Table 1.

This study was compared with the other research performed in nearby areas (Anşin, 1983; Küçük, 1998) in terms of phytogeographical regions, endemism ratio, total taxa number and the richest families.

After the identification of all taxa, the phytogeographical distributions of 220 taxa were determined. The percentages of the phytogeographical origins of these 220 taxa were 193 (50.27%) Euro-Siberian, 23 (5.99%) Irano-Turanian, and 4 (1.04%) Mediterranean. The other 164 taxa (42.70%) are either multi-area elements or single elements which have not yet been accepted as members of any phytogeographical area. The endemism rate of the study area is 8.3% (32 taxa). This rate is low compared with the average endemism rate of the flora of Turkey (30%) because the endemism rate of the Euro-Siberian phytogeographical region is lower than that of the other 2 phytogeographical regions. A comparison of the distribution of species according to their phytogeographical regions and endemism rates is given in Table 2.

The 10 largest families according to number of species in this study are given below.

Table 1. The dispersion of taxa according to the large taxonomical groups.

	Number of Families	Number of Genera	Number of Taxa
<i>Pteridophyta</i>	6	8	11
<i>Gymnospermae</i>	2	3	3
<i>Dicotyledones</i>	46	144	301
<i>Monocotyledones</i>	7	35	69
Total	61	190	384

Table 2. Comparison of the distribution of taxa according to their phytogeographical regions and endemism rates.

Phytogeographical regions	Present study		Anşin (1983)		Küçük (1998)	
	Num.	(%)	Num.	(%)	Num.	(%)
Euro-Siberian	193	50.27	412	19.7	216	39.80
Irano-Turanian	23	5.99	166	7.93	52	9.6
Mediterranean	4	1.04	57	2.72	9	1.7
Endemism	32	8.3	145	6.5	77	14.2
Total number of taxa	384		2092		543	

The family *Asteraceae* (39 taxa), which is represented by the highest number of species throughout the world and also within Turkey, is the largest family in this study. The family *Rosaceae* is the second largest family, with 35 taxa. The family *Poaceae* can be seen third, and the other largest families are listed in Table 3.

Acknowledgements

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Table 3. Numerical and dispersion rates of 10 families containing the most taxa identified in the study area.

Families	Number of taxa	Rates
<i>Asteraceae</i>	39	10
<i>Rosaceae</i>	35	9
<i>Poaceae</i>	29	8
<i>Scrophulariaceae</i>	24	6
<i>Fabaceae</i>	23	6
<i>Caryophyllaceae</i>	15	4
<i>Liliaceae</i>	15	4
<i>Ranunculaceae</i>	14	4
<i>Lamiaceae</i>	12	3
<i>Campanulaceae</i>	11	3
<i>Subtotal</i>	217	57
<i>Others</i>	167	43
Total	384	100

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APPENDIX

FLORISTIC LIST

PTERIDOPHYTA

EQUISETACEAE

Equisetum hyemale L.

Altındere V., Manikli Y., subalpine vegetation, 1950 m, 09.06.2002, 15222, SP 387.

E. palustre L.

Altındere V., Manikli Y., alpine vegetation, streamside, 2000 m, 30.06.2002, 15223, SP 470.

OPHIOGLOSSACEAE

Botrychium lunaria (L.) Sw.

Altındere V., Taşköprü Y., subalpine vegetation, 1780 m, 09.06.2002, 15221, SP 388.

DENNSTAEDTIACEAE

Pteridium aquilinum (L.) Kuhn

Altındere V., Aksu Y., subalpine vegetation, 1650 m, 21.06.2002, 15224, SP 428.

ASPLENIACEAE

Asplenium viride Huds.

Altındere V., Cevlik Y., subalpine vegetation, 1800 m, 09.06.2002, 15225, SP 389.

A. trichomanes L.

Altındere V., Ermeni Y., alpine vegetation, 2000 m, 24.07.2001, 15226, SP 163.

ATHYRIACEAE

Athyrium fragilis (L.) Schott

Altındere V., Ermeni Y., alpine vegetation, 2000 m, 26.05.2002, 15227, SP 375.

Cystopteris fragilis (L.) Bernh.

Altındere V., Aksu Y., subalpine vegetation, rocky crevices, 1650 m, 09.06.2002, 15228, SP 390.

ASPIDIACEAE

Dryopteris filix-mas (L.) Schott

Altındere V., Manikli Y., stony slope, 1900 m, 12.09.2001, 15229, SP 335.

Polystichum aculeatum (L.) Roth

Altındere V., Cevlik Y., subalpine vegetation, 1800 m, 09.06.2002, 15230, SP 391.

P. lonchitis (L.) Roth

Altındere V., Taşköprü Y., stony slope, 1700 m, 05.05.2002, 15231, SP 357.

SPERMATOPHYTA

GYMNOSPERMAE

PINACEAE

Picea orientalis (L.) Link

Altındere V., Cevlik Y., subalpine vegetation, timberline, 1800 m, 07.09.2001, 15232, SP 311, Eux. el.

Pinus sylvestris L.

Altındere V., Manikli Y., subalpine vegetation, rocky places, 1950 m, 07.09.2001, 15233, SP 312, Euro-Sib. el.

CUPRESSACEAE

Juniperus communis L. subsp. *alpina* (Sm.) Celak.

Altındere V., Haliya Y., alpine vegetation, 1935 m, 07.09.2001, 15234, SP 313; Manikli Y., subalpine vegetation, 1938 m, 12.09.2001, 15235, SP 336.

ANGIOSPERMAE

DICOTYLEDONEAE

RANUNCULACEAE

Trollius ranunculinus (Smith) Stearn

Altındere V., Küçükyurt Y., moist meadow, 1860 m, 20.05.2001, 15236, SP 20; Manikli Y., subalpine vegetation, 1900 m, 14.05.2002, 15237, SP 361.

Caltha polypetala Hochst. ex Lorentz

Altındere V., Üçevler Y., alpine vegetation, moist meadow, 2150 m, 08.06.2001, 15238, SP 46; Dilaver Y., alpine vegetation, streamside, 2200 m, 14.05.2002, 15239, SP 362.

Aconitum nasutum Fisch. ex Rchb.

Altındere V., Manikli Y., subalpine vegetation, 1900 m, 12.09.2001, 15240, SP 337, Eux. el.

Delphinium formosum Boiss. & Huet

Altındere V., Manikli Y., subalpine vegetation, streamside, 1980 m, 24.07.2001, 15241, SP 164, Eux. el., Endemic, LR (lc).

Anemone narcissiflora L. subsp. *narcissiflora*

Altındere V., Cevlik Y., subalpine vegetation, stony slope, 1800 m, 26.05.2002, 15242, SP 376, Euro-Sib. el.

A. blanda Schott & Kotschy

Altındere V., Aksu Y., subalpine vegetation, 1650 m, 14.05.2002, 15243, SP 363.

Ranunculus cappadocicus Willd

Altındere V., Taşkoprü Y., subalpine vegetation, streamside, 1720 m, 09.06.2002, 15244, SP 392, Eux. el.

R. brutius Ten.

Altındere V., Cevlik Y., subalpine vegetation, 1850 m, 09.06.2002, 15245, SP 393, Euro-Sib. el.

R. brachylobus Boiss. & Hohen. subsp. *brachylobus*

Altındere V., Eşkaya Y., alpine vegetation, 2075 m, 24.07.2001, 15246, SP 165; Haliya Y., alpine vegetation, 2000 m, 07.09.2001, 15247, SP 314, Hyr-Eux. (mt.) el.

R. dissectus M.Bieb. subsp. *huetii* (Boiss.) P.H.Davis

Altındere V., Eşkaya Y., stony slope, 2200 m, 26.05.2001, 15248, SP 31, Endemic, LR (lc).

R. polyanthemus L.

Altındere V., İskobel Y., alpine vegetation, 2280 m, 08.06.2001, 15249, SP 45; Haliya Y., alpine vegetation, 2100 m, 19.06.2001, 15250 SP 65; Haliya Y., alpine vegetation, streamside, 2100 m, 13.07.2001, 15251, SP 147; Taşkoprü Y., subalpine vegetation, streamside, 1700 m, 09.06.2002, 15252, SP 394.

R. constantinopolitanus (DC.) d'Urv.

Altındere V., Ermeni Y., alpine vegetation, 1960 m, 21.04.2001, 15253, SP 7; Karahava Y., alpine vegetation, 2250 m, 20.05.2001, 15254, SP 21.

Aquilegia olympica Boiss.

Altındere V., Haliya Y., alpine vegetation, 1900 m, 19.06.2001, 15255, SP 66; Taşkoprü Y., subalpine vegetation, 1680 m, 28.06.2001, 15256, SP 103; Cevlik Y., subalpine vegetation, 1800 m, 21.06.2002, 15257, SP 429.

Thalictrum foetidum L.

Altındere V., Taşkoprü Y., subalpine vegetation, erosion area, 1650 m, 21.06.2002, 15258, SP 430, Euro-Sib. el.

PAPAVERACEAE

Papaver lateritium Koch

Altındere V., Küçükyurt Y., alpine vegetation, 1830 m, 28.06.2001, 15259, SP 104; Taşkoprü Y., subalpine vegetation, erosion area, 1730 m, 21.06.2002, 15260, SP 431, Eux. el.; Endemic, VU.

Corydalis caucasica DC.

Altındere V., Aksu Y., subalpine vegetation, damp shady slope, 1630 m, 17.04.2002, 15261, SP 350, Eux. el.

URTICACEAE

Urtica dioica L.

Altındere V., Taşkoprü Y., subalpine vegetation, 1720 m, 30.06.2002, 15262, SP 471, Euro-Sib. el.

BETULACEAE

Corylus avellana L. var. *avellana*

Altındere V., Aksu Y., subalpine

vegetation, 1680 m, 09.06.2002, 15263, SP 395, Euro-Sib. el.

Betula pendula Roth

Altındere V., Manikli Y., subalpine vegetation, 1900 m, 30.06.2002, 15264, SP 472.

B. litwinowii Doluch.

Altındere V., Haliya Y., subalpine vegetation, 1930 m, 19.06.2001, 15265, SP 67; Manikli Y., subalpine vegetation, 1938 m, 12.09.2001, 15266, SP 338, Eux. el.

Alnus glutinosa (L.) Gaertn. subsp. *barbata* (C.A.Mey.) Yalt.

Altındere V., Aksu Y., subalpine vegetation, streamside, 1650 m, 19.06.2001, 15267, SP 68.

CARYOPHYLLACEAE

Minuartia hirtusa (M.Bieb.) Hand. Mazz. subsp. *falcata* (Gris) Mattf.

Altındere V., Üçevler Y., alpine vegetation, 2157 m, 24.08.2001, 15268, SP 309; Manikli Y., alpine vegetation, 2100 m, 12.09.2001, 15269, SP 339.

M. recurva (All.) Schinz & Thell. subsp. *oreina* (Mattf.) McNeill

Altındere V., Haliya Y., alpine vegetation, 1945 m, 13.07.2001, 15270 SP 148; Haliya Y., alpine vegetation, 2063 m, 07.08.2001, 15271, SP 214.

Stellaria holostea L.

Altındere V., Aksu Y., subalpine vegetation, 1650 m, 26.05.2002, 15272, SP 377, Euro-Sib. el.

Cerastium anomalum Waldst. & Kit.

Altındere V., Dilaver Y., alpine vegetation, 2150 m, 12.09.2001, 15273, SP 340.

C. lazicum Boiss.

Altındere V., Üçevler Y., alpine vegetation, 2150 m, 24.07.2001, 15274, SP 166, Eux. (mt.) el.; Endemic, LR (cd).

C. armeniacum Gren.

Altındere V., Çakırgöl environs, alpine vegetation, 2340 m, 30.06.2002, 15275, SP 473, Endemic, LR (lc).

C. gnaphalodes Fenzl

Altındere V., Ermeni Y., alpine vegetation, 1900 m, 20.05.2001, 15276, SP 22, Endemic, LR (lc).

C. purpurascens Adams

Altındere V., Ermeni Y., alpine vegetation, 1900 m, 20.05.2001, 15277, SP 23, Eux. (mt.) el.

C. longifolium Willd

Altındere V., Ermeni Y., alpine vegetation, stony slope, 1900 m, 20.05.2001, 15278, SP 24, Ir-Tur. el.

Petrohragia saxifraga (L.) Link

Altındere V., Küçükyurt Y., alpine vegetation, 1830 m, 28.06.2001, 15279, SP 105, Euro-Sib. el.

Gypsophila silenoides Rupr.

Altındere V., Taşkoprü Y., subalpine vegetation, roadside, sandy soil, 1650 m, 21.06.2002, 15280, SP 432, Eux. (mt.) el.

Silene saxatilis Sims.

Altındere V., Taşkoprü Y., subalpine vegetation, 1680 m, 28.06.2001, 15281, SP 106; Eşkiya Y., alpine vegetation, 2100 m, 13.07.2001, 15282, SP 149; Üçevler Y., alpine vegetation, 2100 m, 24.07.2001, 15283, SP 167.

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

Altındere V., Eşkiya Y., alpine vegetation, 2047 m, 07.09.2001, 15284, SP 315.

S. alba (Mill.) Krause subsp. *divaricata* (Rchb.) Walters

Altındere V., Eşkiya Y., alpine vegetation, 2100 m, 13.07.2001, 15285, SP 150; Selboğazı Y., alpine vegetation, 2150 m, 21.08.2001, 15286, SP 268.

Scleranthus uncinatus Schur

Altındere V., Taşkoprü Y., subalpine vegetation, 1740 m, 14.06.2002, 15287, SP 427; Karahava Y., alpine vegetation, 2260 m, 30.06.2002, 15288, SP 474.

POLYGONACEAE

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

Altındere V., Ermeni Y., alpine vegetation, 1980 m, 28.06.2001, 15289, SP 107; Üçevler Y., alpine vegetation, 2100 m, 13.07.2001, 15290, SP 151; Eşkiya Y., alpine vegetation, 2150 m, 21.08.2001, 15291, SP 269, Eux. (mt.) el.

Rumex acetosella L.

Altındere V., Küçükyurt Y., alpine vegetation, sandy soil on roadside, 1830 m, 28.06.2001, 15292, SP 108, Cosm.

R. scutatus L.

Altındere V., Taşkoprü Y., subalpine vegetation, sandy soil on roadside, 1650 m, 21.06.2002, 15293, SP 433.

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

Altındere V., Haliya Y., alpine vegetation, streamside, 1900 m, 07.09.2001, 15294, SP 316, Ir-Tur. el.

R. alpinus L.

Altındere V., Üçevler Y., alpine vegetation, fieldside, 2120 m, 28.06.2001, 15295, SP 109.

R. crispus L.

Altındere V., Taşkoprü Y., subalpine vegetation, streamside, 1700 m, 21.06.2002, 15296, SP 434, Cosm.

CLUSIACEAE (GUTTIFERAE)

Hypericum linarioides Bosse

Altındere V., Eşkiya Y., alpine vegetation, 2130 m, 13.07.2001, 15297, SP 152; Papazyurt Y., alpine vegetation, 2365 m, 07.08.2001, 15298, SP 215; İskobel Y., alpine vegetation, 2265 m, 24.07.2001, 15299, SP 168.

H. bithynicum Boiss.

Altındere V., Küçükyurt Y., alpine vegetation, 1800 m, 28.06.2001, 15300, SP 110; Üçevler Y., alpine vegetation, 2078 m, 24.07.2001, 15301, SP 169; Üçevler Y., alpine vegetation, 2150 m, 21.08.2001, 15302, SP 270; Taşkoprü Y., subalpine vegetation, 1770 m, 21.08.2001, 15303, SP 271, Eux. el.

H. orientale L.

Altındere V., Ermeni Y., alpine vegetation, 2000 m, 24.07.2001, 15304, SP 170; Taşkoprü Y., subalpine vegetation, 1700 m, 24.07.2001, 15305, SP 171.

H. perforatum L.

Altındere V., Haliya Y., alpine vegetation, 2000 m, 07.09.2001, 15306, SP 317.

CISTACEAE

Helianthemum nummularium (L.) Mill. subsp. *nummularium*

Altındere V., Haliya Y., alpine vegetation, stony slope, 1940 m, 19.06.2001, 15307, SP 69.

H. nummularium (L.) Mill. subsp. *tomentosum* (Scop.) Schinz & Thell.

Altındere V., Eşkiya Y., alpine vegetation, rocky place, 2063 m, 07.08.2001, 15308, SP 216; Haliya Y., alpine vegetation, stony slope, 1992 m, 07.09.2001, 15309, SP 318.

VIOLACEAE

Viola odorata L.

Altındere V., Aksu Y., subalpine vegetation 1650 m, 05.05.2002, 15310, SP 358.

V. sieheana Becker

Altındere V., Eşkiya Y., alpine vegetation, 2100 m, 08.06.2001, 15311, SP 46; Haliya Y., alpine vegetation, 1940 m, 19.06.2001, 15312, SP 70.

V. altaica Ker Gawl. subsp. *oreades* (M.Bieb.) Becker

Altındere V., Ermeni Y., alpine vegetation, 1960 m, 21.04.2001, 15313, SP 8; Papazyurt Y., alpine vegetation, 2300 m, 26.05.2001, 15314, SP 32; Dilaver Y., alpine vegetation, 2065 m, 14.05.2002, 15315, SP 364.

SALICACEAE

Salix caprea L.

Altındere V., Manikli Y., subalpine vegetation, 1935 m, 07.09.2001, 15316, SP 319, Euro-Sib. el.

Populus tremula L.

Altındere V., Manikli Y., alpine vegetation, 2000 m, 30.06.2002, 15317, SP 475, Euro-Sib. el.

BRASSICACEAE (CRUCIFERAE)

Thlaspi perfoliatum L.

Altındere V., Üçevler Y., alpine vegetation, 2050 m, 08.06.2001, 15318, SP 47.

Capsella bursa-pastoris (L.) Medik.

Altındere V., Aksu Y., subalpine vegetation, damp place, 1700 m, 07.09.2001, 15319, SP 320; Taşkoprü Y., subalpine vegetation, damp meadows, 1700 m, 21.06.2002, 15320, SP 435, Cosm.

Draba rigida Willd. var. *rigida*

Altındere V., Papazyurt Y., alpine vegetation, rocky area, 2300 m, 26.05.2001, 15321, SP 33, Endemic, LR (lc).

D. hispida Willd.

Altındere V., Ermeni Y., alpine vegetation, 2150 m, 21.08.2001, 15322, SP 272, Eux. (mt.) el.

D. siliquosa M.Bieb.

Altındere V., Üçevler Y., alpine vegetation, stony slope, 2100 m, 21.04.2001, 15323, SP 9; Eşkya Y., alpine vegetation, stony slope, 2100 m, 26.05.2001, 15324, SP 34, Hyr-Eux. (mt.) el.

Barbarea integrifolia DC.

Altındere V., Dilaver Y., alpine vegetation, streamside, 2150 m, 30.06.2002, 15325, SP 476, Endemic, EN.

Cardamine raphanifolia Pourr. subsp. *acris* (Gris) O.E.Schulz

Altındere V., Ermeni Y., alpine vegetation, streamside, 1900 m, 20.05.2001, 15326, SP 25; Üçevler Y., alpine vegetation, streamside, 2050 m, 08.06.2001, 15327, SP 48, Euro-Sib. el.

C. impatiens L. var. *impatiens*

Altındere V., Taşkoprü Y., subalpine vegetation, damp meadow, 1650 m, 21.06.2002, 15328, SP 436; Cevlik Y., subalpine vegetation, streamside, 1800 m, 21.06.2002, 15329, SP 437, Euro-Sib. el.

Erysimum pulchellum (Willd.) J.Gay

Altındere V., Dilaver Y., alpine vegetation, 2100 m, 30.06.2002, 15330, SP 477.

RESEDACEAE

Reseda lutea L. var. *lutea*

Altındere V., Taşkoprü Y., subalpine vegetation, 1710 m, 24.07.2001, 15331, SP 172.

ERICACEAE

Rhododendron luteum Sweet

Altındere V., Taşkoprü Y., subalpine vegetation, 1700 m, 17.08.2001, 15332, SP 265.

R. ponticum L. subsp. *ponticum* var. *ponticum*

Altındere V., Taşkoprü Y., subalpine vegetation, 1700 m, 17.08.2001, 15333, SP 266; Cevlik Y., subalpine vegetation, 1650 m, 17.08.2001, 15334, SP 267, Eux. el.

R. x sochadzeae Kharadze & Davlian.

Altındere V., Taşkoprü Y., subalpine vegetation, 1780 m, 09.06.2002, 15335, SP 396.

Vaccinium myrtillus L.

Altındere V., Eşkya Y., alpine vegetation, 2100 m, 08.06.2001, 15336, SP 49; Haliya Y., alpine vegetation, 1950 m, 07.08.2001, 15337, SP 217; Selboğazi Y., alpine vegetation, 2170 m, 21.08.2001, 15338, SP 305, Euro-Sib. el.

V. uliginosum L.

Altındere V., Eşkya Y., alpine vegetation, 2177 m, 07.08.2001, 15339, SP 218.

V. arctostaphylos L.

Altındere V., Haliya Y., 1900 m, 19.06.2001, 15340, SP 71; Eşkya Y., streamside, 2165 m, 07.09.2001, 15341, SP 321; Taşkoprü Y., 1700 m, subalpine vegetation, 09.06.2002, 15342, SP 397, Eux. el.

PRIMULACEAE

Primula vulgaris Huds. subsp. *vulgaris*

Altındere V., Taşkoprü Y., alpine vegetation, 1700m., 17.04.2002, 15343, SP 351; Aksu Y., subalpine vegetation, 1620 m, 17.04.2001, 15344, SP 5, Euro-Sib. el.

P. veris L. subsp. *columnae* (Ten.) Lüdi

Altındere V., Taşkoprü Y., subalpine vegetation, among *Rhododendron luteum* bushes, 1720 m, 17.04.2002, 15345, SP 352; Aksu Y., subalpine vegetation, 1650 m, 05.05.2002, 15346, SP 359, Euro-Sib. el.

P. elatior (L.) Hill subsp. *pallasii* (Lehm.) W.W.Sm. & Forrest

Altındere V., Cevlik Y., alpine vegetation, 1850 m, 26.05.2002, 15347, SP 378, Euro-Sib. el.

P. auriculata Lam.

Altındere V., Ermeni Y., alpine vegetation, damp meadow, 2000 m, 08.06.2001, 15348, SP 50; Üçevler Y., alpine vegetation, damp meadow, 2120 m, 28.06.2001, 15349, SP 111, Ir-Tur. el.

Cyclamen parviflorum Pobed.

Altındere V., Papazyurdu Y., alpine vegetation, 2300 m, 26.03.2001, 15350, SP 1, Eux. el.; Endemic, LR (lc).

GROSSULARIACEAE

Ribes biebersteinii Berl. ex DC.

Altındere V., Taşkoprü Y., subalpine vegetation, 1730 m, 09.06.2002, 15351, SP 398, Eux. el.

CRASSULACEAE

Sedum spurium M.Bieb.

Altındere V., Üçevler Y., alpine vegetation, 2078 m, 24.07.2001, 15352, SP 173; Haliya Y., alpine vegetation, 1980 m, 07.08.2001, 15353, SP 219, Hyr-Eux. el.

S. stoloniferum Gmel.

Altındere V., Taşkoprü Y., subalpine vegetation, 1770 m, 24.07.2001, 15354, SP 174, Hyr-Eux. el.

S. alpestre Vill.

Altındere V., Karahava Y., alpine vegetation, rocky area, 2200 m, 30.06.2002, 15355, SP 478, Euro-Sib. el.

S. tenellum M.Bieb.

Altındere V., Haliya Y., rocky area, 2000 m, 19.06.2001, 15356, SP 72; above Haliya Y., stony slope, 2378 m, 07.08.2001, 15357, SP 220; Camiboğazi Y., rocky area, 2300 m, 30.06.2002, 15358, SP 479, Hyr-Eux. el.

S. gracile C.A.Mey.

Altındere V., İskopel Y., stony slope, 2266 m, 24.07.2001, 15359, SP 175; İskopel Y., stony slope, 2268 m, 07.08.2001, 15360, SP 221, Hyr-Eux. (mt.) el.

S. pilosum M.Bieb.

Altındere V., Dilaver Y., alpine vegetation, 2130 m, 30.06.2002, 15361, SP 480, Hyr-Eux. el.

Sempervivum minus Turrill var. *glabrum* Wale

Altındere V., İskobel Y., alpine vegetation, rocky area, 2150 m, 21.08.2001, 15362, SP 273, Eux. (mt.) el.; Endemic, LR (nt).

SAXIFRAGACEAE

Saxifraga paniculata Mill. subsp. *paniculata*

Altındere Vadisi, Dilaver Y., alpine vegetation, 2150 m, 30.06.2002, 15363, SP 481, Euro-Sib. el.

S. rotundifolia L.

Altındere V., Manikli Y., rocky area, 1903 m, 12.09.2001, 15364, SP 341, Euro-Sib. el.

S. sibirica L. subsp. *mollis* (Sm.) Matthews

Altındere V., Eşkya Y., alpine vegetation, streamside, 2100 m, 19.06.2001, 15365, SP 73.

S. cymbalaria L. var. *cymbalaria*

Altındere V., Üçevler Y., rocky area, alpine vegetation, 2150 m, 21.08.2001, 15366, SP 274.

S. cymbalaria L. var. *huetiana* (Boiss.) Engl. & Irmisch.

Altındere V., Taşkoprü Y., subalpine vegetation, rocky area, 1680 m, 13.04.2001, 15367, SP 2.

Parnassia palustris L.

Altındere V., Üçevler Y., alpine vegetation, damp meadow, 2160 m, 21.08.2001, 15368, SP 275.

ROSACEAE

Aruncus vulgaris Rafin.

Altındere V., Taşkoprü Y., subalpine vegetation, streamside, 1730 m, 09.06.2002, 15369, SP 399, Euro-Sib. el.

Prunus divaricata Ledeb. subsp. *divaricata*

Altındere V., Aksu Y., bushy place, 1650 m, 05.05.2002, 15370, SP 360.

Rubus idaeus L.

Altındere V., Manikli Y., alpine vegetation, 2000 m, 30.06.2002, 15371, SP 482.

Potentilla crantzii (Crantzow) Beck ex Fritsch var. *crantzii*

Altındere V., Taşkoprü Y., subalpine vegetation, 1730 m, 21.06.2002, 15372, SP 438, Euro-Sib. el.

P. humifusa Willd.

Altındere V., Eşkya Y., alpine vegetation, damp meadow, 2100 m, 26.05.2001, 15373, SP 35, Euro-Sib. el.

P. cappadocica Boiss.

Altındere V., Taşkoprü Y., subalpine vegetation, 1730 m, 21.06.2002, 15374, SP 439, Eux. (mt.) el.; Endemic, LR (nt).

P. erecta (L.) Raeusch.

Altındere V., Taşkoprü Y., subalpine vegetation, 1750 m, 20.05.2001, 15375, SP 26; Eşkya Y., alpine vegetation, 2100 m, 08.06.2001, 15376, SP 51; Üçevler Y., alpine vegetation, 2100 m, 24.07.2001, 15377, SP 176.

P. elatior Willd. ex Schltr.

Altındere V., Papazyurdu Y., alpine vegetation, 2166 m, 07.08.2001, 15378, SP 222; Taşkoprü Y., subalpine vegetation, 1710 m, 21.08.2001, 15379, SP 276, Eux. el.

P. speciosa Willd. var. *speciosa*

Altındere V., Taşkoprü Y., subalpine vegetation, 1700 m, 19.05.2001, 15380, SP 17; Eşkya Y., alpine vegetation, 2100 m, 19.06.2001, 15381, SP 74.

P. micrantha Ramond ex DC.

Altındere V., Aksu Y., subalpine vegetation, damp meadow, 1650 m, 17.04.2001, 15382, SP 6, Euro-Sib. el.

Fragaria vesca L.

Altındere V., Taşkoprü Y., subalpine vegetation, 1730 m, 09.06.2002, 15383, SP 400.

Sibbaldia parviflora Willd. var. *parviflora*

Altındere V., Aksu Y., subalpine vegetation, 1650 m, 17.04.2002, 15384, SP 353; Eşkya Y., alpine vegetation, 2100 m, 19.06.2001, 15385, SP 75.

Geum coccineum Sm.

Altındere V., Haliya Y., alpine vegetation, 1940 m, 19.06.2001, 15386, SP 76; Manikli Y., alpine vegetation, 1950 m, 26.05.2002, 15387, SP 379, Euro-Sib. el.

G. urbanum L.

Altındere V., Taşkoprü Y., subalpine vegetation, 1700 m, 21.06.2002, 15388, SP 440, Euro-Sib. el.

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

Altındere V., Taşkoprü Y., subalpine vegetation, roadside, 1650 m, 21.06.2002, 15389, SP 441.

Alchemilla sericata Rchb.

Altındere V., Eşkya Y., alpine vegetation, 2150 m, 19.06.2001, 15390, SP 77, Hyr-Eux. (mt.) el.

A. caucasica Buser

Altındere V., Üçevler Y., alpine vegetation, 2150 m, 21.08.2001, 15391, SP 277, Eux. (mt.) el.

A. erythropoda Juz.

Altındere V., Eşkya Y., alpine vegetation, 2100 m, 19.06.2001, 15392, SP 78, Euro-Sib. el.

A. surculosa E.Fröhner

Altındere V., Üçevler Y., alpine vegetation, 2157 m, 24.07.2001, 15393, SP 177, Hyr-Eux. (mt.) el.

A. plicatissima E.Fröhner

Altındere V., Küçükyurt Y., alpine vegetation, 1800 m, 20.05.2001, 15394, SP 27, Hyr-Eux. (mt.) el.

A. lithophila Juz.

Altındere V., İskobel Y., alpine vegetation, 2266 m, 24.07.2001, 15395, SP 178.

A. orthotricha Rothm.

Altındere V., Dilaver Y., alpine vegetation, 2100 m, 20.06.2001, 15396, SP 95; Taşkoprü Y., subalpine vegetation, 1650m, 21.06.2002, 15397, SP 442, Eux. (mt.) el.

A. hirtipedicellata Juz.

Altındere V., Küçükyurt Y., alpine vegetation, 1800 m, 28.06.2001, 15398, SP 112; Taşkoprü Y., subalpine vegetation, 1650 m, 21.06.2002, 15399, SP 443, Eux. (mt.) el.

A. mollis (Buser) Rothm.

Altındere V., Manikli Y., alpine vegetation, damp meadow, 2100 m, 20.06.2001, 15400, SP 96.

A. oriturcica Pawl.

Altındere V., Küçükyurt Y., alpine vegetation, 1800 m, 28.06.2001, 15401, SP 113, Ir-Tur. el.; Endemic, VU.

A. sintenisii Rothm.

Altındere V., Aksu Y., subalpine vegetation, 1650 m, 24.06.2002, 15402, SP 469, Eux. (mt.) el.; Endemic, LR (nt).

A. barbatiflora Juz.

Altındere V., Selboğazı Y., alpine vegetation, 2150 m, 21.08.2001, 15403, SP 278, Eux. el.

A. retinervis Buser

Altındere V., Taşköprü Y., subalpine vegetation, 1730 m, 09.06.2002, 15404, SP 401, Eux.(mt.) el.

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

Altındere V., Haliya Y., alpine vegetation, 1900 m, 07.09.2001, 15405, SP 322.

Cotoneaster nummularia Fisch. & Mey.

Altındere V., Manikli Y., rocky area, 2000 m, 26.05.2002, 15406, SP 380.

Crataegus microphylla C.Koch

Altındere V., Aksu Y., subalpine vegetation, 1600 m, 09.06.2002, 15407, SP 402, Hyr-Eux. el.

Sorbus aucuparia L.

Altındere V., Haliya Y., subalpine vegetation, 1800 m, 07.09.2001, 15408, SP 323, Euro-Sib. el.

S. subfusca (Ledeb.) Boiss.

Altındere V., Manikli Y., subalpine vegetation, 1900 m, 30.06.2002, 15409, SP 483, Eux. el.

Pyrus communis L. subsp. *sativa* (DC.) Hegi

Altındere V., Aksu Y., subalpine vegetation, 1680 m, 09.06.2002, 15410, SP 403.

P. communis L. subsp. *caucasica* (Fed.) Browicz.

Altındere V., Aksu Y., subalpine vegetation, 1680 m, 09.06.2002, 15411, SP 404.

FABACEAE (PAPILIONACEAE)

Genista albida Willd.

Altındere V., Eşkiya Y., alpine vegetation, 2120 m, 19.06.2001, 15412, SP 79; Aksu Y., subalpine vegetation, 1680 m, 09.06.2001, 15413, SP 62.

Astragalus lineatus Lam. var. *jildisianus* (Bornm.) Matthews

Altındere V., Taşköprü Y., subalpine vegetation, rocky area, 1750 m, 09.06.2002, 15414, SP 405, Endemic, LR (nt).

A. lineatus Lam. var. *longidens* (Frey) Matthews

Altındere V., Taşköprü Y., subalpine vegetation, 1750 m, 09.06.2002, 15415, SP 406, Ir-Tur. el.

A. fragrans Willd.

Altındere V., Karahava Y., alpine vegetation, 2260 m, 30.06.2002, 15416, SP 484, Ir-Tur. el.

Vicia cracca L. subsp. *cracca*

Altındere V., Eşkiya Y., alpine vegetation, 2066 m, 24.07.2001, 15417, SP 179, Euro-Sib. el.

V. villosa Roth subsp. *villosa*

Altındere V., Üçevler Y., alpine vegetation, 2100 m, 28.06.2001, 15418, SP 114.

V. balansae Boiss.

Altındere V., Manikli Y., alpine vegetation, damp meadow, 1950 m, 09.06.2002, 15419, SP 407, Eux. el.

Pisum sativum L. subsp. *elatius* (M.Bieb.) Asch. & Graebn. var. *elatius*

Altındere V., Aksu Y., subalpine vegetation, 1700 m, 30.06.2001, 15420, SP 142, Medit. el.

Trifolium rytidosemium Boiss. & Hohen. var. *rytidosemium*.

Altındere V., Manikli Y., alpine meadow, 2000 m, 21.08.2001, 15421, SP 279, Hyr-Eux (mt.) el.

T. polyphyllum C.A.Mey.

Altındere V., Eşkiya Y., alpine vegetation, 2150 m, 19.06.2001, 15422, SP 80; Üçevler Y., alpine vegetation, 2100 m, 28.06.2001, 15423, SP 115, Eux. (mt.) el.

T. repens L. var. *repens*

Altındere V., Üçevler Y., alpine meadow, 2150 m, 21.08.2001, 15424, SP 280.

T. spadiceum L.

Altındere V., Eşkiya Y., alpine vegetation, 2078 m, 24.07.2001, 15425, SP 180; Haliya Y., alpine vegetation, 1980 m, 07.08.2001, 15426, SP 223, Euro-Sib. el.

T. aureum Pollich

Altındere V., Ermeni Y., alpine vegetation, 1960 m, 12.09.2001, 15427, SP 342, Euro-Sib. el.

T. pratense L. var. *pratense*

Altındere V., Haliya Y., alpine vegetation, 1900 m, 07.09.2001, 15428, SP 324.

T. pratense L. var. *sativum* Schreb.

Altındere V., Eşkiya Y., alpine vegetation, 2077 m, 07.08.2001, 15429, SP 224.

T. ochroleucum Huds.

Altındere V., Selboğazı Y., alpine vegetation, 2200 m, 28.06.2001, 15430, SP 116; Taşköprü Y., subalpine vegetation, erosion area, 1650 m, 21.06.2002, 15431, SP 444.

T. canescens Willd.

Altındere V., Haliya Y., alpine vegetation, 2000 m, 19.06.2001, 15432, SP 81, Hyr-Eux. el.

T. pannonicum Jacq. subsp. *elongatum* (Willd.) Zohary

Altındere V., Eşkiya Y., alpine vegetation, 2075 m, 24.07.2001, 15433, SP 181, Endemic, LR (lc).

Medicago falcata L.

Altındere V., Karahava Y., alpine vegetation, 2250 m, 30.06.2002, 15434, SP 485.

Lotus corniculatus L. var. *corniculatus*

Altındere V., Selboğazı Y., alpine vegetation, 2200 m, 22.06.2001, 15435, SP 102.

L. corniculatus L. var. *alpineus* Ser.

Altındere V., Papazyurdu Y., alpine vegetation, 2200 m, 07.08.2001, 15436, SP 225.

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

Altındere V., Papazyurdu Y., alpine vegetation, 2166 m, 07.08.2001, 15437, SP 226.

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

Altındere V., Haliya Y., alpine vegetation, 1945 m, 13.07.2001, 15438, SP 153.

THYMELACEAE

Daphne mezereum L.

Altındere V., Aksu Y., subalpine vegetation, damp meadow, 1680 m, 17.04.2002, 15439, SP 354; Manikli Y., subalpine vegetation, 1900 m, 30.06.2002, 15440, SP 486, Euro-Sib. el.

D. pontica L.

Altındere V., Aksu Y., subalpine vegetation, 1650 m, 09.06.2002, 15441, SP 408, Eux. el.

D. glomerata Lam.

Altındere V., Taşköprü Y., subalpine vegetation, damp meadow, 1700 m, 19.05.2001, 15442, SP 18; Haliya Y., subalpine vegetation, 1980 m, 07.08.2001, 15443, SP 227, Eux. el.

ONAGRACEAE

Epilobium angustifolium L.

Altındere V., Haliya Y., stony slope, 2050 m, 07.08.2001, 15444, SP 228; Haliya Y., stony slope, 1950 m, 07.09.2001, 15445, SP 325.

E. montanum L.

Altındere V., Haliya Y., alpine vegetation, streamside, 1935 m, 13.07.2001, 15446, SP 154, Euro-Sib. el.

E. minutiflorum Hausskn.

Altındere V., Üçevler Y., alpine vegetation, 2120 m, 21.08.2001, 15447, SP 281, Ir-Tur. el.

E. ponticum Hausskn.

Altındere V., Aksu Y., subalpine vegetation, streamside, 1700 m, 19.06.2001, 15448, SP 82.

E. gemmascens C.A.Mey.

Altındere V., Haliya Y., alpine vegetation, streamside, 1900 m, 07.09.2001, 15449, SP 326.

SANTALACEAE

Thesium alpinum L.

Altındere V., Cevlik Y., subalpine vegetation, 1850 m, 21.06.2002, 15450, SP 445, Euro-Sib. el.

CELASTRACEAE

Euonymus europaeus L.

Altındere V., Aksu Y., subalpine vegetation, 1680 m, 09.06.2002, 15451, SP 409.

AQUIFOLIACEAE

Ilex colchica Pojark.

Altındere V., Aksu Y., subalpine vegetation, 1680 m, 09.06.2002, 15452, SP 410, Eux. el.

EUPHORBIACEAE

Euphorbia djimilensis Boiss.

Altındere V., Manikli Y., alpine vegetation, 2000 m, 09.06.2002, 15453, SP 411, Eux. el.; Endemic, LR (nt).

E. amygdaloides L. var. *amygdaloides*

Altındere V., Ermeni Y., alpine vegetation, 2050 m, 08.06.2001, 15454, SP 52, Euro-Sib. el.

LINACEAE

Linum hypericifolium Salisb.

Altındere V., Manikli Y., subalpine vegetation, 1900 m, 30.06.2002, 15455, SP 487.

POLYGALACEAE

Polygala supina Boiss.

Altındere V., Ermeni Y., alpine vegetation, 1980 m, 07.08.2001, 15456, SP 229, Ir-Tur. el.

P. papilionacea Schreb.

Altındere V., Eşkiya Y., alpine vegetation, 2100 m, 19.06.2001, 15457, SP 83, Ir-Tur. el.

P. comosa Schkuhr

Altındere V., Taşköprü Y., subalpine vegetation, 1730 m, 21.06.2002, 15458, SP 446.

P. alpestris Rchb.

Altındere V., Yeşilyurt Y., alpine vegetation, 2280 m, 08.06.2001, 15459, SP 53; Papazyurdu Y., alpine vegetation, 2230 m, 13.07.2001, 15460, SP 155; Haliya Y., alpine vegetation, 1860 m, 20.05.2001, 15461, SP 28, Euro-Sib. el.

ACERACEAE

Acer trautvetteri Medw.

Altındere V., Manikli Y., subalpine vegetation, in bushy areas, 1900 m, 30.06.2002, 15462, SP 488, Eux. el.

OXALIDACEAE

Oxalis acetosella L.

Altındere V., Taşköprü Y., in subalpine bushes, shady area, 1700 m, 14.05.2002, 15463, SP 365.

GERANIACEAE

Geranium sylvaticum L.

Altındere V., Eşkiya Y., alpine vegetation, 2100 m, 13.07.2001, 15464, SP 156; Haliya Y., alpine vegetation, 1900 m, 19.06.2001, 15465, SP 84; Papazyurdu Y., alpine vegetation, 2200 m, 07.08.2001, 15466, SP 230; Taşköprü Y., subalpine vegetation, streamside, 1700 m, 21.06.2002, 15467, SP 447, Euro-Sib. el.

G. asphodeloides Burm. subsp. *asphodeloides*

Altındere V., Yeni Y., alpine vegetation, 2356 m, 13.07.2001, 15468, SP 157; Eşkiya Y., alpine vegetation, 2380 m, 07.08.2001, 15469, SP 231, Euro-Sib. el.

G. asphodeloides Burm. subsp. *sintensisii* (Freyn) P.H.Davis

Altındere V., Ermeni Y., alpine vegetation, 1970 m, 28.06.2001, 15470, SP 117; Ermeni Y., alpine vegetation, 2120 m, 28.06.2001, 15471, SP 118; Üçevler Y., alpine vegetation, 2150 m, 21.08.2001, 15472, SP 282, Eux. el.; Endemic, LR (lc).

G. pyrenaicum Burm.

Altındere V., Taşköprü Y., subalpine vegetation, streamside, 1720 m, 21.06.2002, 15473, SP 448.

G. cinereum Cav. subsp. *subcaulescens* (L'Hér. ex DC.) Hayek var. *ponticum* P.H.Davis & Roberts

Altındere V., Camiboğazı Y., alpine meadows, 2300 m, 30.06.2002, 15474, SP 489, Eux. (mt.) el.; Endemic, LR (lc).

G. ibericum Cav. subsp. *jubatium* (Hand.-Mazz.) P.H.Davis

Altındere V., Papazyurdu Y., alpine vegetation, 2230 m, 13.07.2001, 15475, SP 158; Üçevler Y., alpine vegetation, 2067 m, 24.07.2001, 15476, SP 182; Eşkiya Y., alpine vegetation, 2166 m, 07.08.2001, 15477, SP 232, Eux. (mt.) el.; Endemic, LR (lc).

APIACEAE (UMBELLIFERAE)

Astrantia maxima Pall. subsp. *maxima*

Altındere V., Haliya Y., alpine vegetation, 1945 m, 07.08.2001, 15478, SP 233; Selboğazı Y., alpine vegetation, 2160 m, 21.08.2001, 15479, SP 283, Eux. el.

Eryngium giganteum M.Bieb.

Altındere V., Aksu Y., subalpine vegetation, 1650 m, 24.07.2001, 15480, SP 183, Eux. el.

Chaerophyllum aureum L.

Altındere V., Taşköprü Y., subalpine vegetation, 1700 m, 21.06.2002, 15481, SP 449.

Carum meifolium (M.Bieb.) Boiss.

Altındere V., İskobel Y., alpine vegetation, 2254 m, 24.07.2001, 15482, SP 184; Manikli Y., subalpine vegetation, 1900 m, 09.06.2002, 15483, SP 412.

Chamaescadium acaule (M.Bieb.) Boiss.

Altındere V., İskobel Y., alpine vegetation, rocky area, 2266 m, 24.07.2001, 15484, SP 185, Hyr-Eux. el.

Pimpinella rhodantha Boiss.

Altındere V., Haliya Y., alpine vegetation, 1945 m, 07.08.2001, 15485, SP 234.

Cnidium silaifolium (Jacq.) Simonk. subsp. *orientale* (Boiss.) Tutin

Altındere V., Haliya Y., alpine vegetation, 1990 m, 07.08.2001, 15486, SP 235.

Peucedanum longifolium Waldst. & Kit.

Altındere V., Manikli Y., alpine vegetation, 1900 m, 09.06.2002, 15487, SP 413, Euro-Sib. el.

Heracleum plathytaenium Boiss.

Altındere V., Taşkoprü Y., subalpine vegetation, erosion area, 1650 m, 21.06.2002, 15488, SP 450; Cevlik Y., subalpine vegetation, erosion area, 1800 m, 30.06.2002, 15489, SP 490, Eux. el., Endemic, LR (lc).

GENTIANACEAE

Gentiana asclepiadea L.

Altındere V., Taşkoprü Y., subalpine vegetation, 1710 m, 21.08.2001, 15490, SP 284, Euro-Sib. el.

G. aquatica L.

Altındere V., Taşkoprü Y., subalpine vegetation, damp meadow, 1720 m, 17.04.2002, 15491, SP 355.

G. pyrenaica L.

Altındere V., Eşkiya Y., alpine vegetation, 2100 m, 26.05.2001, 15492, SP 36; Papazyurdu Y., alpine vegetation, 2150 m, 19.06.2001, 15493, SP 85; Dilaver Y., alpine vegetation, 2100 m, 12.09.2001, 15494, SP 343, Euro-Sib. el.

G. septemfida Pall.

Altındere V., Selboğazı Y., alpine vegetation, 2200 m, 21.08.2001, 15495, SP 285, Hyr-Eux (mt.) el.

G. verna L. subsp. *pontica* (Soltok.) Hayek

Altındere V., Eşkiya Y., alpine vegetation, 2150 m, 26.05.2001, 15496, SP 37; Eşkiya Y., alpine vegetation, 2100 m, 08.06.2001, 15497, SP 54; Eşkiya Y., alpine vegetation, 2100 m, 09.06.2001, 15498, SP 63; Dilaver Y., alpine vegetation, 2100 m, 14.05.2002, 15499, SP 366, Hyr-Eux. (mt.) el.

Gentiana caucasea (G.Lodd. ex Sims) Holub

Altındere V., Üçevler Y., alpine vegetation, 2100 m, 21.08.2001, 15500, SP 286; Haliya Y., alpine vegetation, 1900 m, 07.09.2001, 15501, SP 327, Eux. (mt.) el.

SOLANACEAE

Atropa belladonna L.

Altındere V., Taşkoprü Y., subalpine vegetation, 1650 m, 21.08.2001, 15502, SP 287, Euro-Sib. el.

Hyoscyamus niger L.

Altındere V., Taşkoprü Y., subalpine vegetation, in bushy areas, 1700 m, 09.06.2002, 15503, SP 414.

BORAGINACEAE

Myosotis alpestris F.W.Schmidt subsp. *alpestris*

Altındere V., Ermeni Y., alpine vegetation, 2000 m, 24.07.2001, 15504, SP 186.

M. olympica Boiss.

Altındere V., Eşkiya Y., alpine vegetation, erosion area, 2120 m, 28.06.2001, 15505, SP 119, Eux. (mt.) el.

Arnebia pulchra (Roem. & Schult.) Edmondson

Altındere V., Üçevler Y., alpine vegetation, damp meadow, 2100 m, 28.06.2001, 15506, SP 120; Cevlik Y., subalpine vegetation, damp meadow, 1800 m, 21.06.2001, 15507, SP 101, Hyr-Eux. (mt.) el.

Echium vulgare L.

Altındere V., Manikli Y., alpine vegetation, 1950 m, 15508, SP 310, Euro-Sib. el.

Symphytum asperum Lepech.

Altındere V., Cevlik Y., subalpine vegetation, damp meadow, 1800 m, 24.07.2001, 15509, SP 187, Hyr-Eux. el.

S. longipetiolatum Wickens

Altındere V., Üçevler Y., alpine vegetation, damp meadow, 2066 m, 24.07.2001, 15510, SP 188, Eux. el.; Endemic, VU.

LAMIACEAE (LABIATAE)

Ajuga orientalis L.

Altındere V., Taşkoprü Y., subalpine vegetation, 1710 m, 21.04.2001, 15511, SP 10; Ermeni Y., alpine vegetation, 1950 m, 21.04.2001, 15512, SP 11; Manikli Y., alpine vegetation, 1950 m, 14.05.2002, 15513, SP 367.

Stachys macrantha (C.Koch) Stearn

Altındere V., Haliya Y., alpine vegetation, 1900 m, 19.06.2001, 15514, SP 86; Ermeni Y., alpine vegetation, 2030 m, 24.07.2001, 15515, SP 189; Haliya Y., alpine vegetation, 1945 m, 07.08.2001, 15516; Aksu Y., alpine vegetation, 1680 m, 21.08.2001, 15517, SP 288, Eux. el.

Prunella vulgaris L.

Altındere V., Taşkoprü Y., subalpine vegetation, 1760 m, 24.07.2001, 15518, SP 190; Cevlik Y., subalpine vegetation, 1800 m, 24.07.2001, 15519, SP 191, Euro-Sib. el.

Origanum vulgare L. subsp. *vulgare*

Altındere V., Manikli Y., subalpine vegetation, roadside stony soil, 1900 m, 07.09.2001, 15520, SP 328, Euro-Sib. el.

Clinopodium vulgare L. var. *vulgare*

Altındere V., Eşkiya Y., alpine vegetation, 2050 m, 07.09.2001, 15521, SP 329.

C. vulgare L. subsp. *arundanum* (Boiss.) Nyman

Altındere V., Taşkoprü Y., subalpine vegetation, 1710 m, 21.08.2001, 15522, SP 289.

Thymus praecox Opiz subsp. *skorpilii* (Velen.) Jalas var. *skorpilii*

Altındere V., İskobel Y., alpine vegetation, stony slope, 2254 m, 24.07.2001, 15523, SP 192.

T. praecox Opiz subsp. *grossheimi* (Ronniger) Jalas var. *grossheimi*

Altındere V., Taşkoprü Y., subalpine vegetation, roadside, 1700 m, 19.05.2001, 15524, SP 19.

T. pubescens Boiss. & Kotschy ex. Celak.

Altındere V., Haliya Y., alpine vegetation, 2000 m, 07.08.2001, 15525, SP 237.

T. pseudopulegioides Klokov & Des.-Shost.

Altındere V., Haliya Y., subalpine vegetation, 1945 m, 07.08.2001, 15526, SP 238; Manikli Y., subalpine vegetation, 1938 m, 12.09.2001, 15527, SP 344, Eux. (mt.) el.

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

Altındere V., Taşkoprü Y., subalpine vegetation, 1710 m, 21.08.2001, 15528, SP 290, Eux. el.

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

Altındere V., Taşkoprü Y., subalpine vegetation, 1710 m, 21.08.2001, 15529, SP 291.

PLANTAGINACEAE

Plantago major L. subsp. *major*

Altındere V., Cevlik Y., streamside, 1800 m, 09.06.2002, 15530, SP 415.

P. lanceolata L.

Altındere V., Taşkoprü Y., subalpine vegetation, roadside, 1650 m, 21.06.2002, 15531, SP 451.

SCROPHULARIACEAE

Verbascum pyramidatum M.Bieb.

Altındere V., Ermeni Y., alpine vegetation, stony slope, 1950 m, 28.06.2001, 15532, SP 121, Hyr-Eux. el.

V. gnaphalodes M.Bieb.

Altındere V., Aksu Y., subalpine vegetation, 1650 m, 09.06.2002, 15533, SP 416, Eux. el.

Scrophularia chrysantha Jaub. & Spach

Altındere V., Dilaver Y., alpine vegetation, rocky area, 2200 m, 14.05.2002, 15534, SP 368, Eux. el.

S. scopolii Hoppe ex Pers. var. *adenocalyx* Sommier & Levier

Altındere V., Aksu Y., subalpine vegetation, 1650 m, 31.05.2001, 15535, SP 43; Taşkoprü Y., subalpine vegetation, 1700 m, 21.06.2002, 15536, SP 452, Eux. el.

S. cinerascens Boiss.

Altındere V., Küçükyurt Y., alpine vegetation, 1860 m, 28.06.2001, 15537, SP 122.

S. canina L. subsp. *bicolor* (Sm.) Greuter

Altındere V., Taşkoprü Y., subalpine vegetation, 1700 m, 09.06.2002, 15538, SP 417, Medit. el.

Digitalis ferruginea L. subsp. *schischkinii* (Ivan.) Werner

Altındere V., Taşkoprü Y., subalpine vegetation, 1700 m, 07.09.2001, 15539, SP 330, Eux. el.

Veronica gentianoides Vahl.

Altındere V., Küçükyurt Y., alpine vegetation, 1866 m, 12.09.2001, 15540, SP 345; Manikli Y., alpine vegetation, 2060 m, 30.06.2002, 15541, SP 491, Hyr-Eux. (mt.) el.

V. polita Fr.

Altındere V., Taşkoprü Y., subalpine vegetation, 1700 m, 20.05.2001, 15542, SP 29, Cosm.

V. beccabunga L.

Altındere V., Üçevler Y., streamside, damp meadow, 2120 m, 28.06.2001, 15543, SP 123; Karahava Y., streamside, 2250 m, 30.06.2002, 15544, SP 492.

V. baranetzki Bordz.

Altındere V., Eşkiya Y., alpine vegetation, wet meadow, 2040 m, 26.05.2001, 15545, SP 38, Hyr-Eux. el.

V. peduncularis M.Bieb.

Altındere V., Taşkoprü Y., subalpine vegetation, 1700 m, 19.06.2001, 15546, SP 87.

Euphrasia rostkoviana Hayne subsp. *rostkoviana*

Altındere V., Haliya Y., alpine vegetation, 1980 m, 07.08.2001, 15547, SP 239, Euro-Sib. el.

E. hirtella Jordan ex Reuter

Altındere V., Papazyurdu Y., alpine vegetation, 2375 m, 07.08.2001, 15548, SP 240, Euro-Sib. el.

E. pectinata Ten.

Altındere V., Haliya Y., alpine vegetation, 1980 m, 07.08.2001, 15549, SP 241, Euro-Sib. el.

E. lebardensis Kem.-Nath.

Altındere V., Haliya Y., alpine vegetation, 1980 m, 07.08.2001, 15550, SP 242, Eux. el.

E. sevanensis Juz.

Altındere V., Haliya Y., alpine vegetation, 1980 m, 07.08.2001, 15551, SP 243, Eux. el.

Pedicularis caucasica L.

Altındere V., Cevlik Y., subalpine vegetation, 1820 m, 09.06.2002, 15552, SP 418, Hyr-Eux. (mt.) el.

P. pontica Boiss.

Altındere V., Eşkiya Y., alpine vegetation, 2100 m, 08.06.2001, 15553, SP 55; Eşkiya Y., alpine vegetation, 2150 m, 19.06.2001, 15554, SP 88; Manikli Y., alpine vegetation, 2000 m, 30.06.2002, 15555, SP 493, Eux. el.

P. condensata M.Bieb.

Altındere V., Üçevler Y., alpine vegetation, 2120 m, 28.06.2001, 15556, SP 124, Eux. (mt.) el.

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

Altındere V., Üçevler Y., alpine vegetation, 2120 m, 28.06.2001, 15557, SP 125.

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

Altındere V., Taşkoprü Y., subalpine vegetation, 1680 m, 28.06.2001, 15558, SP 126.

Rhynchosorys elephas (L.) Griseb. subsp. *elephas*

Altındere V., Taşkoprü Y., subalpine vegetation, 1700 m, 12.07.2001, 15559, SP 145, Euro-Sib. el.

R. stricta (C.Koch) Albov

Altındere V., Taşkoprü Y., subalpine vegetation, 1680 m, 28.06.2001, 15560, SP 127, Eux. el.

GLOBULARIACEAE

Globularia trichosantha Fisch. & C.A.Mey.

Altındere V., Papazyurdu Y., alpine vegetation, 2356 m, 13.07.2001, 15561, SP 159; Selboğazı Y., alpine vegetation, 2160 m, 24.07.2001, 15562, SP 193, Ir-Tur. el.

OROBANCHACEAE

Orobanche nana Noè ex Beck

Altındere V., Aksu Y., on *Alchemilla* sp., 1650 m, 21.06.2002, 15563, SP 453.

LENTIBULARIACEAE

Pinguicula balcanica Casper subsp. *pontica* Casper

Altındere V., Eşkya Y., alpine vegetation, streamside, 2100 m, 08.06.2001, 15564, SP 56; Üçevler Y., alpine vegetation, streamside, 2100 m, 28.06.2001, 15565, SP 128; Cevlik Y., subalpine vegetation, wet meadow, 1800 m, 21.06.2002, 15566, SP 454, Eux. el.

CAMPANULACEAE

Campanula rapunculoides L. subsp. *cordifolia* (C.Koch) Damboldt

Altındere V., Üçevler Y., alpine vegetation, 2075 m, 24.07.2001, 15567, SP 194.

C. glomerata L. subsp. *hispida* (Witasek) Hayek

Altındere V., Taşkoprü Y., subalpine vegetation, 1700 m, 07.08.2001, 15568, SP 244, Eux. el.

C. collina Sims

Altındere V., Üçevler Y., alpine vegetation, 2075 m, 24.07.2001, 15569, SP 195, Eux. el.

C. tridentata Schreb.

Altındere V., Taşkoprü Y., subalpine vegetation, 1750 m, 09.06.2002, 15570, SP 419, Eux. (mt.) el.

C. aucheri A.DC.

Altındere V., Ermeni Y., alpine vegetation, rocky area, 1970 m, 28.06.2001, SP 129, 15571, Eux. (mt.) el.

C. lactiflora M.Bieb.

Altındere V., Cevlik Y., subalpine vegetation, 1834 m, 07.08.2001, 15572, SP 245; Aksu Y., subalpine vegetation, 1720 m, 07.08.2001, 15573, SP 246; Taşkoprü Y., subalpine vegetation, 1700 m, 21.08.2001, 15574, SP 292, Eux. el.

C. stevenii M.Bieb. subsp. *beauverdiana* (Fomin) Rech.

Altındere V., Ermeni Y., alpine vegetation, 1970 m, 28.06.2001, 15575, SP 130, Ir-Tur. el.

C. olympica Boiss.

Altındere V., Üçevler Y., alpine vegetation, 2075 m, 24.07.2001, 15576, SP 196, Eux. el.

C. rapunculus L. var. *rapunculus*

Altındere V., Üçevler Y., alpine vegetation, 2120 m, 28.06.2001, 15577, SP 131,

C. rapunculus L. var. *lambertiana* (A.DC.) Boiss.

Altındere V., Taşkoprü Y., subalpine vegetation, 1700 m, 30.06.2002, 15578, SP 494, Euro-Sib. el.

Jasione supina Sieber subsp. *pontica* (Boiss.) Damboldt

Altındere V., Papazyurdu Y., alpine vegetation, 2356 m, 13.07.2001, 15579, SP 160; Selboğazi Y., alpine vegetation, 2160 m, 24.07.2001, 15580, SP 197, Eux. (mt.) el.; Endemic, VU.

RUBIACEAE

Asperula pontica Boiss.

Altındere V., Üçevler Y., alpine vegetation, 2157 m, 24.07.2001, 15581, SP 198, Eux. (mt.) el.

Galium odoratum (L.) Scop.

Altındere V., Taşkoprü Y., subalpine vegetation, 1700 m, 21.06.2002, 15582, SP 455, Euro-Sib. el.

G. humifusum M.Bieb.

Altındere V., Ermeni Y., alpine vegetation, 2078 m, 24.07.2001, 15583, SP 199.

G. fissurense Ehrend.& Schön.-Tem.

Altındere V., Taşkoprü Y., subalpine vegetation, 1710 m, 21.08.2001, 15584, SP 293, Eux. el.; Endemic, LR (lc).

Cruciata taurica (Pall. ex Willd.) Ehrend.

Altındere V., Eşkya Y., alpine vegetation, marshy area, 2100 m, 08.06.2001, 15585, SP 57; Taşkoprü Y., subalpine vegetation, stony slope, 1680 m, 28.06.2001, 15586, SP 132, Ir-Tur. el.

CAPRIFOLIACEAE

Sambucus ebulus L.

Altındere V., Aksu Y., subalpine bushy area, 1650 m, 21.08.2001, 15587, SP 294, Euro-Sib. el.

S. nigra L.

Altındere V., Aksu Y., subalpine bushy area, 1650 m, 21.08.2001, 15588, SP 295, Euro-Sib. el.

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

Altındere V., Manikli Y., subalpine vegetation, 1900 m, 30.06.2002, 15589, SP 495; Taşkoprü Y., subalpine vegetation, 1730 m, 21.06.2002, 15590, SP 456, Endemic, LR (lc).

VALERIANACEAE

Valeriana alliarifolia Adams

Altındere V., Küçükyurt Y., alpine vegetation, 1830 m, 28.06.2001, 15591, SP 133, Euro-Sib. el.

V. alpestris Stev.

Altındere V., Taşkoprü Y., subalpine vegetation, 1720 m, 12.07.2001, 15592, SP 146, Eux. (mt.) el.

V. leucophaea DC.

Altındere V., Cevlik Y., subalpine vegetation, 1850 m, 09.06.2002, 15593, SP 420, Hyr-Eux. (mt.) el.

DIPSACACEAE

Scabiosa columbaria L. subsp. *columbaria* var. *columbaria*

Altındere V., Haliya Y., alpine vegetation, 1945 m, 07.08.2001, 15594, SP 247.

S. columbaria L. subsp. *columbaria* var. *intermedia* (Post) Matthews

Altındere V., Selboğazi Y., alpine vegetation, 2157 m, 24.07.2001, 15595, SP 200.

S. caucasica M.Bieb.

Altındere V., Selboğazi Y., alpine vegetation, 2160 m, 21.08.2001, 15596, SP 296, Euro-Sib. el.

ASTERACEAE (COMPOSITAE)

Helichrysum plicatum DC. subsp. *plicatum*

Altındere V., Çakırgöl environs, damp meadow, 2450 m, 30.06.2002, 15597, SP 496.

Solidago virgaurea L. subsp. *alpestris* (Waldst. & Kit.) Gaudin

Altındere V., Haliya Y., alpine vegetation, 1900 m, 07.08.2001, 15598, SP 248, Euro-Sib. el.

Bellis perennis L.

Altındere V., Ermeni Y., alpine vegetation, 1960 m, 21.04.2001, 15599, SP 12, Euro-Sib. el.

Senecio racemosus (M.Bieb.) DC.

Altındere V., Manikli Y., alpine vegetation, 2000 m, 30.06.2002, 15600, SP 497, Ir-Tur. el.

S. pseudo-orientalis Schischk.

Altındere V., Taşköprü Y., subalpine vegetation, 1700 m, 28.06.2001, 15601, SP 134; Eşkya Y., alpine vegetation, damp meadow, 2100 m, 24.07.2001, 15602, SP 201, Ir-Tur. el.

S. vernalis Waldst. & Kit.

Altındere V., Dilaver Y., alpine vegetation, 2150 m, 30.06.2002, 15603, SP 498.

Tussilago farfara L.

Altındere V., Ermeni Y., alpine vegetation, roadside, 1930 m, 21.04.2001, 15604, SP 13, Euro-Sib. el.

Petasites albus (L.) Gaertn.

Altındere V., Taşköprü Y., subalpine vegetation, 1717 m, 17.04.2002, 15605, SP 356, Euro-Sib. el.

Anthemis marschallina Willd. subsp. *pectinata* (Boiss.) Grierson

Altındere V., Eşkya Y., alpine vegetation, 2100 m, 19.06.2001, 15606, SP 89; Eşkya Y., alpine vegetation, 2100 m, 13.07.2001, 15607, SP 161; Selboğazı Y., rocky area, 2222 m, 24.07.2001, 15608, SP 202, Eux. (mt.) el.

Achillea millefolium L. subsp. *millefolium*

Altındere V., Manikli Y., alpine vegetation, 1900 m, 21.06.2002, 15609, SP 457, Euro-Sib. el.

A. setacea Waldst. & Kit.

Altındere V., Haliya Y., alpine vegetation, 2000 m, 19.06.2001, 15610, SP 90; Haliya Y., alpine vegetation, 1945 m, 07.08.2001, 15611, SP 249, Euro-Sib. el.

Tripleurospermum oreades (Boiss.) Rech. var. *tchihatchewii* (Boiss.) E.Hossain

Altındere V., Ermeni Y., rocky area, 2200 m, 21.08.2001, 15612, SP 297; Cevlik Y., rocky area, 1800 m, 21.06.2002, 15613, SP 458.

T. transcaucasicum (Manden.) Pobed.

Altındere V., Yeşilyurt Y., damp meadow, 2280 m, 08.06.2001, 15614, SP 58.

T. monticulum (Boiss. & Huet) Bornm.

Altındere V., Üçevler Y., alpine vegetation, 2078 m, 24.07.2001, 15615, SP 203, Endemic, LR (lc).

Cirsium trachylepis Boiss.

Altındere V., Cevlik Y., subalpine vegetation, 1800 m, 21.08.2001, 15616, SP 298, Eux. el.; Endemic, LR (nt).

C. sommieri Petr.

Altındere V., Eşkya Y., alpine vegetation, 2100 m, 21.08.2001, 15617, SP 299, Ir-Tur. el.; Endemic, LR (lc).

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

Altındere V., Selboğazı Y., alpine vegetation, 2260 m, 21.08.2001, 15618, SP 300.

Carduus adpressus C.A.Mey.

Altındere V., Manikli Y., rocky area, 1950 m, 12.09.2001, 15619, SP 346, Eux. el..

Jurinella moschus (Hablitz) Bobrov subsp. *pinnatisecta* (Boiss.) Danin & P.H.Davis

Altındere V., Mezere hill, roadside stony soil, 2400 m, 19.06.2001, 15620, SP 91, Ir-Tur. el.

Centaurea hypoleuca DC.

Altındere V., Papazyurdu Y., alpine vegetation, 2200 m, 21.04.2001, 15621, SP 14, Eux. el.

C. dealbata Willd.

Altındere V., Haliya Y., alpine vegetation, 1980 m, 07.08.2001, 15622, SP 250.

C. nigrifimbria (C.Koch) Sosn.

Altındere V., Üçevler Y., alpine vegetation, 2100 m, 28.06.2001, 15623, SP 135, Eux. (mt.) el.

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

Altındere V., Taşköprü Y., stony soil, 1730 m, 21.06.2002, 15624, SP 459.

S. cana (C.A.Mey.) Hoffm. var. *jacquiniana* (W.Koch) Chamb.

Altındere V., Taşköprü Y., subalpine vegetation, 1730 m, 21.06.2002, 15625, SP 460.

Leontodon hispidus L. var. *hispidus*

Altındere V., Evliya Y., alpine vegetation, 2100 m, 13.07.2001, 15626, SP 162; Evliya Y., alpine vegetation, 2050 m, 07.09.2001, 15627, SP 331; Taşköprü Y., subalpine vegetation, 1650 m, 21.06.2002, 15628, SP 461.

Hieracium sparsum Friv.

Altındere V., Manikli Y., alpine vegetation, rocky place, 2100 m, 12.09.2001, 15629, SP 347.

Pilosella hoppeana (Schult.) Sch.Bip. & F.W.Schultz subsp. *pilisquama* (NP.) Sell & West

Altındere V., Dilaver Y., alpine vegetation, 2180 m, 17.09.2001, 15630, SP 349, Euro-Sib. el.

P. hoppeana (Schult.) Sch.Bip. & F.W.Schultz subsp. *testimonialis* (Nägeli ex Peter) Sell & West

Altındere V., Haliya Y., alpine vegetation, 1980, 07.08.2001, 15631, SP 251.

P. hoppeana (Schult.) Sch.Bip. & F.W.Schultz subsp. *troika* (Zahn) Sell & West

Altındere V., Eşkya Y., alpine vegetation, 2100 m, 21.08.2001, 15632, SP 301.

P. piloselloides (Vill.) Soják subsp. *piloselloides*

Altındere V., Haliya Y., alpine vegetation, 1980 m, 07.08.2001, 15633, SP 252.

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

Altındere V., Haliya Y., alpine vegetation, 1980 m, 07.08.2001, 15634, SP 253.

P. cymosa (L.) Sch.Bip. & F.W.Schultz

Altındere V., Haliya Y., alpine vegetation, 1980 m, 07.08.2001, 15635, SP 254,

Euro-Sib. el.

P. caespitosa (Dum.) Sell. & West subsp. *brevipila* (NP.) Sell. & West

Altındere V., Papazyurdu Y., alpine vegetation, 2363 m, 07.08.2001, 15636, SP 255.

Prenanthes cacaliifolia (M.Bieb.) Beauverd

Altındere V., Taşköprü Y., subalpine vegetation, 1710 m, 21.08.2001, 15637, SP 302, Eux. el.

Mulgedium tataricum (L.) DC.

Altındere V., Küçükyurt Y., subalpine vegetation, damp meadow, 1800 m, 28.06.2001, 15638, SP 136.

Lapsana communis L. subsp. *intermedia* (M.Bieb.) Hayek

Altındere V., Selboğazı Y., alpine vegetation, 2260 m, 21.08.2001, 15639, SP 303.

Taraxacum bithynicum DC.

Altındere V., Dilaver Y., alpine vegetation, 2134 m, 12.09.2001, 15640, SP 348.

T. scaturiginosum G.E.Haglund.

Altındere V., Ermeni Y., alpine vegetation, 1930 m, 13.04.2001, 15641, SP 3.

T. buttleri Soest

Altındere V., Ermeni Y., alpine vegetation, 1930 m, 13.04.2001, 15642, SP 4.

Crepis paludosa (L.) Moench

Altındere V., Haliya Y., alpine vegetation, 2000 m, 07.08.2001, 15643, SP 256, Euro-Sib. el.

MONOCOTYLEDONEAE

ARACEAE

Arum maculatum L.

Altındere V., Taşköprü Y., subalpine vegetation, 1700 m, 26.05.2002, 15644, SP 381.

JUNACEAE

Juncus effusus L.

Altındere V., Cevlik Y., subalpine vegetation, streamside, 1800 m, 09.06.2002, 15645, SP 421; Karahava Y., alpine vegetation, streamside, 2260 m, 30.06.2002, 15646, SP 499, Cosm.

Luzula forsteri (Sm.) DC.

Altındere V., Taşköprü Y., subalpine vegetation, 1720 m, 09.06.2002, 15647, SP 422, Euro-Sib. el.

L. sylvatica (Huds.) Gaudin

Altındere V., Cevlik Y., subalpine vegetation, 1850 m, 26.05.2002, 15648, SP 382, Euro-Sib. el.

L. pseudosudetica (V.I.Krecz.) V.I.Krecz.

Altındere V., İskobel Y., alpine vegetation, 2267 m, 24.07.2001, 15649, SP 204, Eux. (mt.) el.

L. multiflora (Ehrh.ex Retz.) Lej.

Altındere V., Selboğazı Y., alpine vegetation, 2150 m, 21.08.2001, 15650, SP 304; Karahava Y., alpine vegetation, 2250 m, 30.06.2002, 15651, SP 500.

L. campestris (L.) DC.

Altındere V., Küçükyurt Y., subalpine vegetation, 1800 m, 20.05.2001, 15652, SP 30.

CYPERACEAE

Carex pyrenaica Wahlenb.

Altındere V., Çakırgöl environs, alpine vegetation, wet meadow, 2400 m, 30.06.2002, 15653, SP 501.

C. ovalis Good

Altındere V., Karahava Y., alpine vegetation, wet meadow, 2250 m, 30.06.2002, 15654, SP 502, Euro-Sib. el.

C. riparia Curtis

Altındere V., Cevlik Y., subalpine vegetation, stony slope, 1850 m, 26.05.2002, 15655, SP 383, Euro-Sib. el.

C. pallescens L. var. *chalcodeta* (V.I.Krecz.) O.Nilsson

Altındere V., Ermeni Y., alpine vegetation, 2100 m, 28.06.2001, 15656, SP 137; Haliya Y., alpine vegetation, 1990 m, 07.08.2001, 15657, SP 257, Eux. el.

C. nigra (L.) Reichard subsp. *nigra*

Altındere V., Dilaver Y., alpine vegetation, marshy area, 2100 m, 08.06.2001, 15658, SP 59.

C. nigra (L.) Reichard subsp. *alpinea* (Gaudin) Lemke

Altındere V., Dilaver Y., alpine vegetation, marshy area, 2100 m, 08.06.2001, 15659, SP 60, Euro-Sib. el.

POACEAE (GRAMINEAE)

Bromus commutatus Schrad.

Altındere V., Taşköprü Y., subalpine vegetation, 1700 m, 21.06.2002, 15660, SP 462.

B. scoparius L.

Altındere V., Taşköprü Y., subalpine vegetation, 1700 m, 20.06.2001, 15661, SP 97.

B. erectus Huds.

Altındere V., Karahava Y., alpine vegetation, 2250 m, 30.06.2002, 15662, SP 503.

Helictotrichon pubescens (Huds.) Besser ex Schult. & Schult. subsp. *pubescens*

Altındere V., Selboğazı Y., alpine vegetation, 2200 m, 28.06.2001, 15663, SP 138, Euro-Sib. el.

Gaudiniopsis macra (M.Bieb.) Eig subsp. *macra*

Altındere V., Papazyurdu Y., alpine vegetation, 2177 m, 07.08.2001, 15664, SP 258,

Ir-Tur. el.

Trisetum flavescens (L.) P.Beauv.

Altındere V., Dilaver Y., alpine vegetation, 2200 m, 14.06.2001, 15665, SP 64.

Descampsia caespitosa (L.) P.Beauv.

Altındere V., Ermeni Y., alpine vegetation, 2078 m, 24.07.2001, 15666, SP 205; Selboğazı Y., alpine vegetation, 2150 m, 21.08.2001, 15667, SP 306.

Calamagrostis arundinaceae (L.) Roth

Altındere V., Ermeni Y., alpine vegetation, 2078 m, 24.07.2001, 15668, SP 206, Euro-Sib. el.

Agrostis gigantea Roth

Altındere V., Haliya Y., alpine vegetation, 2050 m, 07.09.2001, 15669, SP 332, Euro-Sib. el.

A. capillaris L. var. *capillaris*

Altındere V., İskobel Y., alpine vegetation, 2267 m, 24.07.2001, 15670, SP 207; Papazyurdu Y., alpine vegetation, 2166 m, 07.08.2001, 15671, SP 259, Euro-Sib. el.

A. stolonifera L.

Altındere V., Papazyurdu Y., alpine vegetation, 2166 m, 07.08.2001, 15672, SP 260, Euro-Sib. el.

Anthoxanthum odoratum L. subsp. *alpineum* (A. & D.Löve) B.M.G.Jones & Melderis

Altındere V., İskobel Y., alpine vegetation, 2267 m, 24.07.2001, 15673, SP 208; Papazyurdu Y., alpine vegetation, 2177 m, 07.08.2001, 15674, SP 261, Euro-Sib. el.

Phleum alpineum L.

Altındere V., Selboğazı Y., alpine vegetation, meadow, 2200 m, 28.06.2001, 15675, SP 139; Karahava Y., alpine vegetation, meadow, 2250 m, 30.06.2002, 15676, SP 504, Euro-Sib. el.

Festuca amethystina L. subsp. *orientalis* Krajina var. *turcica* Markgr.-Dann.

Altındere V., Üçevler Y., alpine vegetation, 2100 m, 24.07.2001, 15677, SP 209, Euro-Sib. (mt.) el.; Endemic, LR (cd).

F. djimilensis Boiss. & Bal.

Altındere V., Selboğazı Y., alpine vegetation, 2200 m, 28.06.2001, 15678, SP 140; Selboğazı Y., alpine vegetation, 2157 m, 24.07.2001, 15679, SP 210, Euro-Sib. (mt.) el.

F. chalcophaea V.I.Krecz. Bobrov subsp. *euryphylla* (St.-Yves) Markgr.-Dann.

Altındere V., Selboğazı Y., alpine vegetation, 2200 m, 28.06.2001, 15680, SP 141, Ir-Tur. el.

F. airoides Lam.

Altındere V., İskobel Y., alpine vegetation, 2266 m, 24.07.2001, 15681, SP 211, Euro-Sib. (mt.) el.

Lolium perenne L.

Altındere V., Taşkoprü Y, subalpine vegetation, 1720 m, 20.06.2001, 15682, SP 98, Euro-Sib. el.

Poa annua L.

Altındere V., Aksu Y., subalpine vegetation, 1650 m, 20.06.2001, 15683, SP 99, Cosm.

P. pratensis L.

Altındere V., Deveboyunu Y., alpine vegetation, 2400 m, 30.06.2001, 15684, SP 143; Taşkoprü Y., subalpine vegetation, 1700 m, 30.06.2002, 15685, SP 505.

P. angustifolia L.

Altındere V., Karahava Y., alpine vegetation, 2250 m, 30.06.2002, 15686, SP 506.

P. nemoralis L.

Altındere V., Taşkoprü Y., subalpine vegetation, 1700 m, 21.06.2002, 15687, SP 463.

P. alpinea L. subsp. *fallax* F.Herm.

Altındere V., Karahava Y., alpine vegetation, 2200 m, 30.06.2002, 15688, SP 507.

P. bulbosa L.

Altındere V., Karahava Y., alpine vegetation, 2250 m, 30.06.2002, 15689, SP 508.

Dactylis glomerata L. subsp. *glomerata*

Altındere V., Haliya Y., alpine vegetation, meadow, 1885 m, 07.08.2001, 15690, SP 262, Euro-Sib. el.

Cynosurus cristatus L.

Altındere V., Taşkoprü Y., subalpine vegetation, streamside, 1700 m, 30.06.2001, 15691, SP 144, Euro-Sib. el.

Sesleria alba Sm.

Altındere V., Dilaver Y., alpine vegetation, 2200 m, 20.06.2001, 15692, SP 100.

Molinia caerulea (L.) Moench

Altındere V., Haliya Y., alpine vegetation, 1990 m, 07.08.2001, 15693, SP 263.

Nardus stricta L.

Altındere V., Ermeni Y., alpine vegetation, meadow, 2100 m, 24.07.2001, 15694, SP 212, Euro-Sib. el.

LILIACEAE

Polygonatum verticillatum (L.) All.

Altındere V., Aksu Y., subalpine vegetation, 1650 m, 09.06.2002, 15695, SP 423, Euro-Sib. el.

Scilla winogradowii Sosn.

Altındere V., Manikli Y., alpine vegetation, wet meadow, 2065 m, 14.05.2002, 15696, SP 369, Eux. el.

S. monanthos C.Koch

Altındere V., Taşkoprü Y., subalpine vegetation, 1700 m, 21.04.2001, 15697, SP 15; Eşkiya Y., alpine vegetation, 2040 m, 26.05.2001, 15698, SP 39, Eux. el.

S. siberica Haw. subsp. *armena* (Grossh.) Mordak

Altındere V., Manikli Y., alpine vegetation, wet meadows, 2065 m, 14.05.2002, 15699, SP 370, Ir-Tur. el.

Ornithogalum oligophyllum E.D.Clarke

Altındere V., Dilaver Y., alpine vegetation, wet meadows, patches of melting snow, 2190 m, 14.05.2002, 15700, SP 371.

O. plathyphyllum Boiss.

Altındere V., Manikli Y., subalpine vegetation, wet meadow, 1930 m, 26.05.2002, 15701, SP 384; Manikli Y., alpine vegetation, streamside, 2000 m, 09.06.2002, 15702, SP 424, Ir-Tur. el.

O. orthophyllum Ten.

Altındere V., Haliya Y., wet meadow, 1950 m, 19.06.2001, 15703, SP 92.

Muscari aucheri (Boiss.) Baker

Altındere V., Manikli Y., alpine vegetation, rocky area, 2100 m, 14.05.2002, 15704, SP 372, Endemic, LR (lc).

M. armeniacum Leichtlin ex Baker

Altındere V., Taşkoprü Y., subalpine vegetation, bushy area, 1700 m, 26.05.2001, 15705, SP 40.

M. coeleste Fomin

Altındere V., Eşkiya Y., alpine vegetation, 2145 m, 26.05.2001, 15706, SP 41, Endemic, LR (lc).

Lilium monadelphum M.Bieb. var. *armenum* (Misch. ex Grossh.) P.H.Davis & D.M.Hend.

Altındere V., Haliya Y., alpine vegetation, 1900 m, 07.08.2001, 15707, SP 264; Cevlik Y., subalpine vegetation, 1850 m, 21.06.2002, 15708, SP 464, Eux. el.

Gagea glacialis C.Koch.

Altındere V., Eşkiya Y., alpine vegetation, damp meadow, 2050 m, 26.05.2001, 15709, SP 42; Dilaver Y., alpine vegetation, damp meadow, 2200 m, 26.05.2002, 15710, SP 385, Ir-Tur. el.

Veratrum album L.

Altındere V., Üçevler Y., alpine vegetation, 2150 m, 21.08.2001, 15711, SP 307; Cevlik Y., subalpine vegetation, 1800 m, 30.06.2002, 15712, SP 509, Euro-Sib. el.

Colchicum szovitsii Fisch. & Mey.

Altındere V., Dilaver Y., alpine vegetation, wet meadow, patches of melting snow, 2162 m, 14.05.2002, 15713, SP 373, Ir-Tur. el.

C. speciosum Steven

Altındere V., Taşköprü Y., subalpine vegetation, meadow, 1700 m, 07.09.2001, 15714, SP 333, Hyr-Eux. el.

IRIDACEAE

Crocus aereus Herb.

Altındere V., Üçevler Y., alpine vegetation, meadow, 2150 m, 21.04.2001, 15715, SP 16; Dilaver Y., alpine vegetation, meadow, 2162 m, 14.05.2002, 15716, SP 374, Euro-Sib. el.; Endemic, VU.

C. scharojanii Rupr.

Altındere V., Selboğazı Y., alpine vegetation, 2260 m, 21.08.2001, 15717, SP 308, Eux. el.

C. vallicola Herb.

Altındere V., Haliya Y., alpine vegetation, 1950 m, 07.09.2001, 15718, SP 334, Eux. el.

ORCHIDACEAE

Gymnadenia conopsea (L.) R.Br.

Altındere V., Cevlik Y., subalpine vegetation, 1850 m, 21.06.2002, 15719, SP 465, Euro-Sib. el.

Coeloglossum viride (L.) Hartm.

Altındere V., Taşköprü Y., subalpine vegetation, 1730 m, 21.06.2002, 15720, SP 466.

Traunsteinera sphaerica (M.Bieb.) Schltr.

Altındere V., Manikli Y., alpine vegetation, 1950 m, 09.06.2002, 15721, SP 425; Cevlik Y., subalpine vegetation, 1850 m, 21.06.2002, 15722, SP 467, Hyr-Eux. el.

Orchis tridentata Scop.

Altındere V., Aksu Y., subalpine vegetation, 1650 m, 09.06.2002, 15723, SP 426, Medit. el.

O. pallens L.

Altındere V., Cevlik Y., alpine vegetation, 1850 m, 26.05.2002, 15724, SP 386, Euro-Sib. el.

Dactylorhiza saccifera (Brongn.) Soó

Altındere V., Eşkiya Y., alpine vegetation, streamside, 2050 m, 08.06.2001, 15725, SP 61, Medit. el.

D. urvilleana (Steud.) H.Baumann & Künkele

Altındere V., Üçevler Y., alpine vegetation, 2140 m, 24.07.2001, 15726, SP 213, Eux. el.

D. euxina (Newski) H.Baumann & Künkele var. *euxina*

Altındere V., Eşkiya Y. alpine vegetation, streamside, 2120 m, 19.06.2001, 15727, SP 93, Eux. el.

D. osmanica (Klinge) Soó var. *osmanica*

Altındere V., Papazyurdu Y. alpine vegetation, wet meadow, 2170 m, 19.06.2001, 15728, SP 94; Dilaver Y. alpine vegetation, wet meadow, 2120 m, 21.06.2002, 15729, SP 468, Ir-Tur. el.; Endemic, LR (lc).