

Vascular Flora of Forest Vegetation in Altındere Valley (Maçka-Trabzon)

Alper UZUN, Salih TERZİOĞLU

Karadeniz Technical University, Faculty of Forestry, Department of Forest Botany, 61080, Trabzon - TURKEY

Received: 06.12.2006

Accepted: 22.11.2007

Abstract: The vascular flora of forest vegetation in Altındere Valley (Maçka-Trabzon) was investigated. The study was conducted between 2001 and 2002, during which time 1200 plant samples were collected. In all, 383 vascular taxa belonging to 246 genera and 84 families were identified. The richest family was *Asteraceae* (35, 9.1%), followed by *Lamiaceae* (27, 7.0%) and *Fabaceae* (23, 6.0%). Additionally, the richest genus was *Campanula* L. (7, 1.82%), followed by *Trifolium* L. (6, 1.56%) and *Acer* L. (6, 1.56%). The phytogeographical regions of 209 (54.56%) taxa were determined. The distribution of taxa within the phytogeographical regions was as follows: Euro-Siberian elements (184, 48.04%), Irano-Turanian elements (14, 3.66%), and Mediterranean elements (11, 2.87%). The number of endemic plants found was 16 (4.2%), while 7 (1.8%) rare plants, whose threat categories according to IUCN were added to floristic list, were found.

Key Words: Altındere Valley, Flora, National Park, Trabzon, Turkey

Altındere Vadisi Orman Vejetasyonunun Vasküler Florası (Maçka-Trabzon)

Özet: Bu çalışmada, Altındere Vadisi (Maçka-Trabzon) orman vejetasyonunun vasküler florası araştırılmıştır. Çalışma 2001 ve 2002 yılları arasında yürütülmüş olup, bu süre içerisinde 1200 bitki materyali toplanmıştır. Teşhis çalışmaları sonucunda 84 aileye ve 246 cinsine ait toplam 383 vasküler bitki taksonu saptanmıştır. En fazla takson içeren aileye *Asteraceae* (35; %9.1)'dir. Bunu *Lamiaceae* (27; %7.0) ve *Fabaceae* (23; %6.0) izlemektedir. Ayrıca en fazla taksona sahip cins *Campanula* L. (7; %1.82) olup, bunu *Trifolium* L. (6; %1.56) ve *Acer* L. (6; %1.56) izlemektedir. Araştırma alanındaki 209 (%54.56) taksonun fitocoğrafik bölgesi belirlenebilmiştir. Bu taksonların fitocoğrafik bölgeler içindeki dağılışı şu şekildedir: Avrupa-Sibirya elementi (184; %48.04), İran-Turan elementi (14; %3.66), Akdeniz elementi (11; %2.87). Araştırma alanında 16 adet endemik (%4.2) ve 7 adet nadir (%1.8) takson tespit edilmiş olup bu bitkilerin IUCN'e göre tehlike kategorileri floristik listeye eklenmiştir.

Anahtar Sözcükler: Altındere Vadisi, Flora, Milli Park, Trabzon, Türkiye

Introduction

This study was carried out in order to identify the vascular flora of the forestlands and open forest areas of Altındere Valley, Turkey. The study area lies in the southern part of A7 in Trabzon province, according to Davis's (1965) grid system (Figure 1). The Altındere River divides the study area into 2 almost equal parts from the northwest to the southeast. The study area is bounded by Coşandere village to the north and Taşköprü Y. to the south. Altındere Valley consists of several rugged hills, including Paskal (1167 m), Yazlıkbaşı (1487 m),

Sivrikaya (1750 m), Büyük (1839 m), Kapılı (1854 m), and Rüş (1787 m).

The study area is in the Colchis province of the Euro-Siberian phytogeographical region (Davis et al., 1971). Moreover, the study area is located between lat 40°47'00"-40°37'30"N and long 39°36'00"-39°43'30" E, and covers ca. 5092 hectares. The southern part of the study area is included in Altındere Valley National Park. This park is one of the most important in Turkey, due to having the most diverse flora comprising several vegetation types (forest, subalpine, and alpine) and the

* E-mail: auzun@ktu.edu.tr

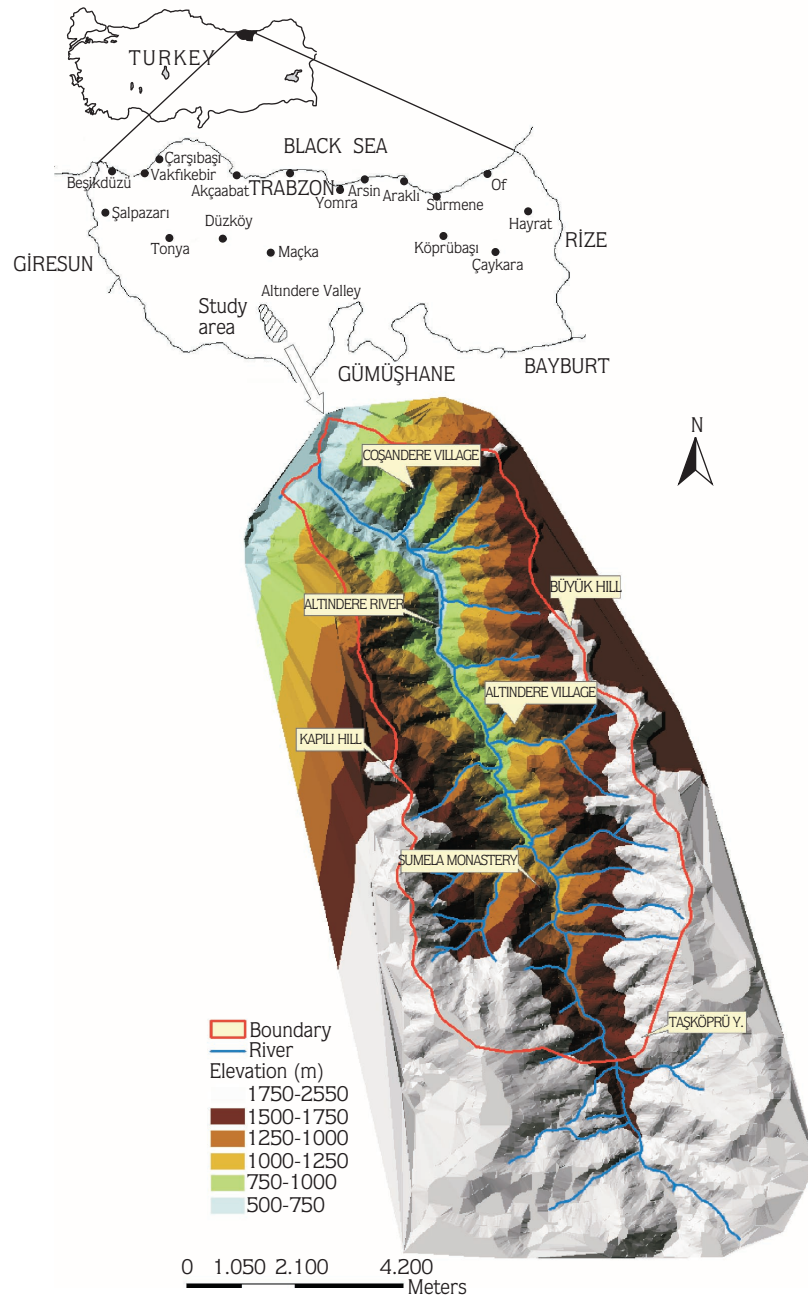


Figure 1. Location and digital elevation model of the study area.

historical value of Sumela (Meryemana) monastery. Situated on a rock face 300 m above the deep valley, it is an important place for spiritual tourism and a favourite spot with tourists travelling along the Black Sea coast.

The climatic data for this area are based on observations of the Meryemana Meteorology Station

between 1975 and 1995. The annual average rainfall is 754 mm and the average temperature is 9.8 °C. The study area lies within the Eastern Black Sea Climatic Region according to the macro climate types of Turkey. Additionally, the climate type of the study area is very humid (Çepel, 1995).

Geographical features of the study area are shown in the digital elevation model (DEM) prepared with the help of the arc/view module of Arc/Info software, a geographic information system tool (Figure 1).

The study area is located in the northern zone of the Eastern Pontides. Four different formations crop out in the study area. These are given from lowest altitude to summit as follows: Hamurkesen Formation, Berdiga Formation, Çatak Formation, and Kaçkar Granitoid I (Anonymous, 1997).

The study area consists of the podzolic soil group, 1 type among the 8 major soil groups in the Eastern Black Sea Region (Anonymous, 1981). The soil structure of the study area varies depending on elevation. Accordingly, the area has red-yellow podzolic soil up to 750 m and gray-brown podzolic soil between 750 and 1750 m (Öztan, 1980).

Forest vegetation in the study area is characterized by 3 main layers; over-storey, mid-storey, and under-storey. Dominant species of over-storey include *Picea orientalis* (L.) Link., *Abies nordmanniana* (Stev.) Spach subsp. *nordmanniana*, *Pinus sylvestris* L. var. *hamata* Steven, *Fagus orientalis* Lipsky, *Castanea sativa* Mill., and *Alnus glutinosa* (L.) Gaertn. subsp. *barbata* (C.A.Mey.) Yalt. Several taxa, such as *Taxus baccata* L., *Salix caprea* L., *Lonicera caucasica* Pall. subsp. *orientalis* (Lam.) Chamb. & Long, *Euonymus europaeus* L., *Frangula alnus* Mill. subsp. *alnus*, *Corylus avellana* L. var. *pontica* (C.Koch) Winkl., *Laurocerasus officinalis* Roem., *Rhododendron ponticum* L., and *Rh. luteum* Sweet, occur at mid-storey. Under-storey has many herbaceous taxa, such as *Pachyphragma macrophyllum* (Hoffm.) Busch, *Ranunculus cappadocicus* Willd., *Cardamine bulbifera* (L.) Crantz, *Stellaria holostea* L., *Geranium sylvaticum* L., *Sanicula europaea* L., *Potentilla elatior* Willd. ex Schldl., *Sedum stoloniferum* C.C.Gmel., and *Senecio pandurifolius* C.Koch.

Materials and Methods

This study included 1200 vascular plant specimens collected from Altındere Valley between January and October 2001, and between February and May 2002. Plant samples were collected, pressed, dried, and mounted on sheets according to standard herbarium techniques. These specimens were identified using the Flora of Turkey and the East Aegean Islands (Davis, 1965-85; Davis et al., 1988; Güner et al., 2000), other

Floras (Anşın, 1979; Komarov, 1934-1978; Bonnier, 1912-1934; Fitter & Blamey, 2000; Phillips, 1994; Clapham et al., 1965; Hegi et al., 1977; Lanzara et al., 1997; Wright, 1992; Godet, 1991; Polunin, 1969), and plant dictionaries (Baytop, 1998; Harrington, 1957; Davis & Cullen, 1989). Furthermore, they were compared to properly identified herbarium specimens in KATO (Herbarium of the Faculty of Forestry, Karadeniz Technical University). Some experts helped us identify some of the specimens, such as *Hieracium* L.

Two samples from each plant taxa were deposited in KATO. Each plant specimen contains a label mounted on sheets, including name of locality (e.g. county, province, and village), habitat types and features (e.g. forest, meadow, stony, rocky, marshy place, and clearings), collecting altitudes and dates, names of collectors, and voucher numbers, indicated by Akman & Ketenöğlü (1987). The phytogeographical regions of the taxa were evaluated according to Davis (1965-1985, 1988). Moreover, cosmopolitan and alien species were indicated in the list. In addition, IUCN threat categories of endemic and rare plants were added to the list according to Ekim et al. (2000), as well as some new reassessments.

Endemic and rare plants, which are likely to become extinct in the near future, have an important value with regard to conservation biology. Consequently, these categories must be taken into consideration for biodiversity conservation.

Spermatophytes were listed systematically according to Davis (1965-85) and *Pteridophytes* according to Parris & Fraser-Jenkins (1980). Author abbreviations of plant names follow Brummitt & Powell (1992). The area lies completely within the A7 grid square and Trabzon province. In citations, A7 Trabzon: Maçka has been omitted to avoid repetition.

Abbreviations

The abbreviations used in the text and the floristic list are as follows: AOO: area of occupancy; A. Uzun: Alper Uzun; Cosm.: cosmopolitan; CR: critically endangered; DD: data deficient; DEM: digital elevation model; EN: endangered; EOO: extent of occurrence; Euro-Sib.: Euro-Siberian; Eux.: Euxine; GIS: geographic information system; Hyr.-Eux.: Hyrcano-Euxine; Ir.-Tur.: Irano-Turanian; IUCN: International Union for the Conservation of Nature and Natural Resources; KATO: Herbarium of

the Faculty of Forestry, Karadeniz Technical University; lat: latitude; long: longitude; LR: low risk (cd: conservation dependent, nt: near threatened, lc: least concern); m: meter; Medit.: Mediterranean; mt.: mountain; RLC: Red List Criteria; RRLA: Rationale for the Red List Assessment; VU: vulnerable; Y.: Yayla/Yaylası.

Result and Discussion

In total, 383 taxa (330 species, 36 subsp., and 17 var.) belonging to 246 genera and 84 families were identified. Nine taxa (2.35%) belong to *Pteridophyta* and 374 taxa (97.65%) belong to *Spermatophyta*. Five taxa (1.3%) belong to *Gymnospermae*, while the other 369 (96.34%) are *Angiospermae*. Distribution of these taxa in taxonomic groups are shown in Table 1.

As indicated in Table 1 and Figure 2, the prevalence of *Pteridophyta* (2.35%) and *Gymnospermae* (1.31%) in this study is higher than what is reported in the Flora of Turkey (0.92% and 0.32%, respectively). While the prevalence of *Dicotyledones*, both in this study (86.42%) and the Flora of Turkey (82.29%) is almost identical, the prevalence of *Monocotyledones* in this study (9.92%) is lower than what is reported in the Flora of Turkey (16.48%) (Güner et al., 2000).

The phytogeographical regions of 209 (54.57%) taxa in the study area was determined. The plant taxa categorisation according to phytogeographical regions is as follows: Euro-Siberian elements 184 (48.04%) (96 Euro-Sib., 70 Eux., 5 Eux. (mt.), 12 Hyr.-Eux., 1 Hyr.-Eux. (mt.)), Ir.-Tur. elements 14 (3.66%), and Medit. elements 11 (2.87%). The remaining 174 taxa (45.43%) are Cosm., multiregional, or of unknown phytogeographical region (Table 2).

In all, 16 taxa were determined to be endemic to Turkey and the endemism rate was 4.2%. As a result of this study threat categories of some taxa were changed through an ongoing project, Coordination and

Development of Plant Red List Assessment for the Caucasus Biodiversity Hotspot. RLC and RRLA of these taxa are given below according to IUCN (IUCN, 2001).

Erysimum deflexum Cullen; RLC: B1ab(i,iii)+2ab(ii), CR. RRLA: Known only from 1 locality, EOO is less than 100 km², AOO is less than 10 km², continuing decline area, extent and quality of habitat, decreasing EOO and AOO. *Sempervivum minus* Turritt var. *minus*; it is LR (lc). *Cirsium trachylepis* Boiss.; RLC: B1ab(i,iii), VU. RRLA: Location number is less than 10 and EOO is less than 20,000 km². *Cyclamen parviflorum* Pobed.; RLC: B1ab(i), VU. RRLA: Location number is 8 and EOO value fits the VU category.

The other endemics were found to be in the same threat categories listed in Ekim et al. (2000), which are as follows: *Papaver lateritium* Koch, *Hieracium gentiliiforme* (Zahn) P.D.Sell & West, *Acer cappadocicum* Gled. var. *stenocarpum* Yalt. is VU, and *Alchemilla sintenisii* Rothm. is LR (nt), and *Dianthus carmelitarum* Reut. ex Boiss., *Phlomis russeliana* (Sims) Benth., *Lamium ponticum* Boiss. & Balansa ex Boiss., *Onosma ambigens* Lacaita, *Campanula betulifolia* C.Koch, *Lonicera caucasica* Pall. subsp. *orientalis* (Lam.) Chamb. & Long, *Heracleum plathytaenium* Boiss., and *Linaria genistifolia* (L.) Mill. subsp. *confertiflora* (Boiss.) P.H. Davis are LR (lc).

In addition to endemics, 7 (1.8%) rare plant taxa were identified in the study area: *Ranunculus bulbosus* L. subsp. *aleae* (Willk.) Rouy & Foucaud, *Epimedium pinnatum* Fisch. subsp. *colchicum* (Boiss.) Busch, *Myosotis lazica* Popov., *Lilium monadelphum* M.Bieb. var. *armenum* (Miscz. ex Grossh.) P.H.Davis & D.M.Hend., *Galanthus rizehensis* Stern, and *Osmanthus decorus* (Boiss. & Balansa) Kasapligil are VU, and *Hieracium asterodermum* (Woronow & Zahn) Juxip is DD. The rare plants are non-endemic to Turkey, have local distribution, and are known from only neighbouring countries (Ekim et al., 2000). The threat categories of these taxa were

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

	Number of Families	Number of Genera	Number of Taxa
Pteridophyta	5	6	9
Gymnospermae	3	5	5
Dicotyledones	67	207	331
Monocotyledones	9	28	38
Total	84	246	383

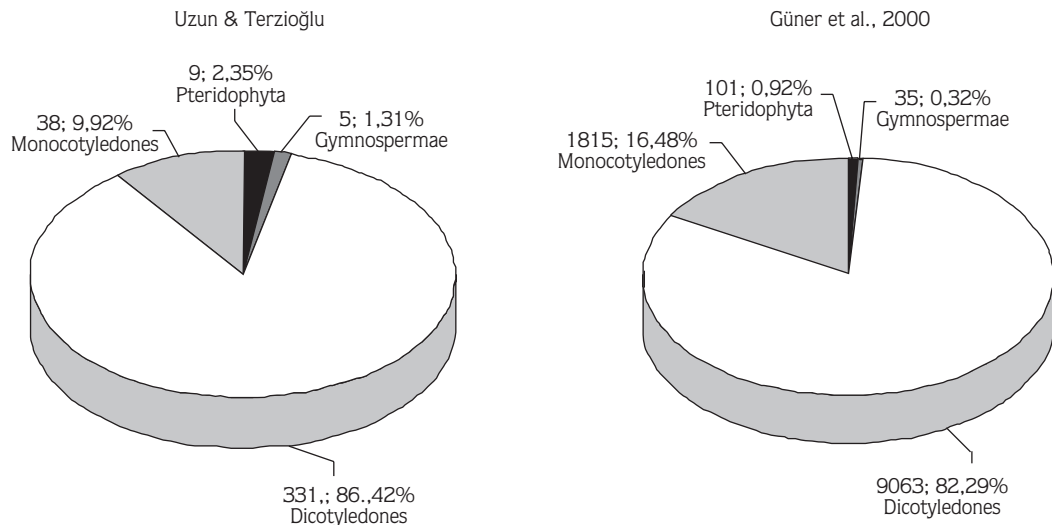


Figure 2. Comparison of this study to the Flora of Turkey according to large taxonomical groups.

Table 2. The distribution of taxa in different floristic regions.

Phytogeographic elements	Number of Taxa	Rate (%)
Euro-Siberian	184	48.04
Irano-Turanian	14	3.66
Mediterranean	11	2.87
Cosmopolitan and others	174	45.43
Total	383	100

assessed while considering their distribution only in Turkey; however, they should be reassessed in consideration of their worldwide distribution.

Cosmopolitan plants are found in most regions of the world and can be easily dispersed in most habitats. In this study 7 (1.8%) plant species, which have remarkably cosmopolitan character, were recorded from the study area. While most of them, such as *Capsella bursa-pastoris* (L.) Medik., *Oxalis corniculata* L., *Tanacetum parthenium* (L.) Sch.Bip., *Cichorium intybus* L., and *Convolvulus arvensis* L., are found in open forest and clearings, others, such as *Veronica anagallis-aquatica* L. and *Juncus effusus* L., are found in wet places and streamsides.

In the present study 3 alien (0.8%) taxa were identified. Among these, *Robinia pseudoacacia* L., which is the most significant and aggressive invasive tree found in Turkey, is mostly distributed in open places and sunny slopes of the study area. The others were *Erigeron annuus* (L.) Pers. and *Conyza canadensis* (L.) Cronquist, distributed in open forest and roadsides at low altitudes.

Alien species are a major threat to the environment because they can change an entire habitat, reduce biodiversity, and place ecosystems at risk.

The results of the present study were compared regarding phytogeographical region, endemism rate, number of vascular (*Pteridophyta* and *Spermatophyta*) taxa, and the largest families to other floristic studies that were conducted in adjacent (Anşın, 1979; Palabaş, Uzun & Anşın, 2006) and nearby areas (Anşın, 1983; Küçük, 1998) (Tables 3 and 4).

The present study area is included in the Euro-Siberian floristic region. As a result, the percentage of Euro-Sib. phytogeographical elements in this study was higher than that reported in other studies (Table 3). The percentage of Ir.-Tur. elements in this comparison represents the floristic distribution of Ir.-Tur. elements in the Eastern Black Sea Region. The prevalence of Ir.-Tur. elements in the study area was low (3.66%) because of the Eastern Black Sea Mountains, which act as a barrier along the sea shore and separate the region into coastal and interior areas. Interior parts of the Eastern Black Sea Region have many more Ir.-Tur. elements (9.60%) (Küçük, 1998). Additionally, the high altitude mountains in this region include a large number of elements belonging to the Ir.-Tur. phytogeographical region (5.99%) (Palabaş Uzun & Anşın, 2006).

The study of Anşın (1983) includes both coastal and interior parts of the Eastern Black Sea Region. Accordingly, the rate of Ir.-Tur. elements (7.93%) in

Table 3. Comparison (%) of floristic results between the present study and other studies conducted in adjacent or nearby areas according to number of taxa, the phytogeographical elements, and endemism.

	Number of taxa	Euro-Sib	Ir-Tur	Medit.	Endemism
Uzun & Terzioğlu	383	48.04	3.66	2.87	4.2
Anşin (1983)	2092	19.70	7.93	2.72	6.5
Küçük (1998)	543	39.80	9.60	1.70	14.2
Palabaş Uzun & Anşin (2006)	385	50.27	5.99	1.04	8.3

Table 4. Comparison of the 10 families containing the most taxa in previous studies conducted in adjacent and nearby areas.

Families	Uzun & Terzioğlu	Palabaş Uzun & Anşin (2006)	Anşin (1979)	Anşin (1983)	Küçük (1998)
<i>Asteraceae</i>	9.1	10.0	9.6	17.2	11.6
<i>Lamiaceae</i>	7.0	3.0	5.1	3.0	6.8
<i>Fabaceae</i>	6.0	6.0	8.8	9.7	5.2
<i>Rosaceae</i>	5.7	9.0	6.0	6.0	7.7
<i>Scrophulariaceae</i>	5.0	6.0	4.2	5.3	4.2
<i>Brassicaceae</i>	4.7	2.3	3.9	6.7	3.1
<i>Apiaceae</i>	4.4	2.3	3.6	5.8	2.4
<i>Liliaceae</i>	2.9	4.0	2.6	1.5	2.8
<i>Poaceae</i>	2.6	8.0	4.3	2.4	4.4
<i>Ranunculaceae</i>	2.6	4.0	3.1	2.8	2.9
Total	55.2	54.6	56.4	69.7	56.7

Anşin (1983) can be evaluated as similar to the average of the rates in Küçük (1998) and Uzun & Terzioğlu.

When we analyzed the Medit. elements, we concluded that the high altitude of the mountains of this region (1.04%; Palabaş Uzun & Anşin, 2006) and the interior parts of the Eastern Black Sea Region (1.70%; Küçük, 1998) have low percentages of Medit. elements because of unsuitable edaphic and climatic conditions (decreasing influence of the humid-warm Black Sea climate).

The endemism rate reported by Küçük (1998) is higher than the rates in other studies. Interior parts of Turkey (especially steppe areas) have higher endemism rates than other regions of the country (Anşin, 1983). The endemism rate in this study (4.2%) is almost half of Palabaş Uzun & Anşin's (2006)'s (8.3%) because the rate of endemism increases from sea level to mountain peaks in this region, as stressed by Anşin (1982). Whereas Palabaş Uzun & Anşin's study covers subalpine and alpine regions in which altitudes varies from 1600 to 3063 m, the present study included forest areas with altitudes of 500-1850 m.

The 10 families and genera that include the most taxa in this study are given below.

Families: *Asteraceae* 35 (9.1%), *Lamiaceae* 27 (7.0%), *Fabaceae* 23 (6.0%), *Rosaceae* 22 (5.7%), *Scrophulariaceae* 19 (5.0%), *Brassicaceae* 18 (4.7%), *Apiaceae* 17 (4.4%), *Liliaceae* 11 (3.1%), *Poaceae* 10 (2.6%), and *Ranunculaceae* 10 (2.6%).

Genera: *Campanula* 7 (1.82%), *Trifolium* 6 (1.56%), *Acer* 6 (1.56%), *Geranium* 6 (1.56%), *Stachys* 6 (1.56%), *Silene* 5 (1.30%), *Cardamine* 5 (1.30%), *Salvia* 5 (1.30%), *Veronica* 5 (1.30%), and *Hypericum* 4 (1.04%).

Among these 84 families, the 10 richest families were compared to other studies (Anşin, 1979; Anşin, 1983; Küçük, 1998; Palabaş Uzun & Anşin, 2006) in Table 4.

Comparing the rates of the 10 families with the most taxa in the present study to other studies carried out in adjacent and nearby areas, *Asteraceae* is ranked first in all studies because it is the largest family of the Turkish

Flora and includes a large number of genera containing many taxa. Additionally, the members of the family include many diaspores that are easily dispersed (Terzioğlu & Anşin 2001). The prevalence of *Poaceae* in the present study was lower than what was reported by Anşin (1979), Küçük (1998), and Palabaş Uzun & Anşin (2006) because this study included forestland areas, excluding huge meadows.

When we evaluated the total rate of each study, all rates, including the 10 families with the most taxa, were almost the same, excluding Anşin (1983) in which the Eastern Black Sea Region was completely studied.

Many publications (Anşin, 1979; Anşin, 1983; Coşkunçelebi & Beyazoğlu, 2003; Davis, 1965-1985; Davis, 1988; Güner et al., 2000; Kılınç & Karakaya,

1990; Küçük, 1998; Palabaş Uzun & Anşin, 2006) have been reviewed. Consequently, 9 taxa were defined as new records for the A7 square throughout this study. These are as follows: *Viola suavis* M.Bieb., *Fibigia clypeata* (L.) Medik., *Lathyrus nissolia* L., *Orlaya daucooides* (L.) Greuter, *Stachys annua* (L.) L. subsp. *annua* var. *lycaonica* R.Bhattacharjee, *Linaria genistifolia* (L.) Mill. subsp. *confertiflora* (Boiss.) P.H.Davis, *Valerianella dentata* (L.) Pollich, *Dianthus carthusianorum* L., and *Hesperis matronalis* L. subsp. *adzharica* (Tzvelev) Cullen.

Acknowledgement

We would like to thank Dr. Kamil Coşkunçelebi for his kind help in identification of *Hieracium* specimens.

References

- Akman Y & Ketenoğlu O (1987). *Vejetasyon Ekolojisi (Bitki Sosyolojisi)*. Ankara: Ankara Üniversitesi Basımevi, Yayın No: 146.
- Anonymous (1981). *Doğu Karadeniz Havzası Toprakları*. Ankara: Topraksu Genel Müdürlüğü, Topraksu Genel Müd. Yayın No: 310.
- Anonymous (1997). *Trabzon İlinin Çevre Jeolojisi ve Doğal Kaynakları*. Ankara: Maden Tetkik ve Arama Genel Müdürlüğü.
- Anşin R (1979). *Trabzon-Meryemana Araştırma Ormanı Florası ve Saf Ladin Meşcerelerinde Floristik Araştırmalar*. Trabzon: Karadeniz Gazetecilik ve Matbaacılık A.Ş.
- Anşin R (1982). Endemizm ve Doğu Karadeniz Bölgesinde Yetişen Endemik Bitki Taksonları. *Karadeniz Teknik Üniversitesi Orman Fakültesi Dergisi* 5: 311-326.
- Anşin R (1983). Türkiye'nin Flora Bölgeleri ve Bu Bölgelerde Yayılan Asal Vejetasyon Tipleri. *Karadeniz Teknik Üniversitesi Orman Fakültesi Dergisi* 6: 318-339.
- Baytop A (1998). *İngilizce-Türkçe Botanik Kılavuzu*. İstanbul: İ.Ü. Basımevi ve Film Merkezi, Üniversite Yayın No: 4058.
- Bonnier G (1912-1934). *Flore Complete Illustrée en Couleurs de France Suisse et Belgique*. Vol. I-XII, Neuchatel, Paris, Bruxelles.
- Brummitt RK & Powell CE (1992). *Authors of Plant Names*. Kew: Royal Botanic Gardens.
- Clapham AR, Tutin TG & Warburg EF (1965). *Flora of The British Isles*. Vol. IV, London: Cambridge University Press.
- Coşkunçelebi K & Beyazoğlu O (2003). Additional Records of *Hieracium* L. and *Pilosella* Hill (*Compositae: Lactuceae*) for the Flora of Turkey. *Turk J Bot* 27: 499-504.
- Çepel N (1995). *Orman Ekolojisi*. İstanbul: İ.Ü. Basımevi ve Film Merkezi, Dördüncü Baskı, Üniversite Yayın No: 3886.
- Davis PH (1965-85). *Flora of Turkey and the East Aegean Islands*. Vol. I-IX, Edinburgh: Edinburgh University Press.
- Davis PH, Mill RR & Tan K (1988). *Flora of Turkey and the East Aegean Islands*. Vol. X, Suppl. – I, Edinburgh: Edinburgh University Press.
- Davis PH & Cullen J (1989). *The Identification of Flowering Plant Families*. Cambridge: Cambridge University Press, Third Edition.
- Davis PH, Harper PC & Hedge IC (1971). *Plant Life of South-West Asia*. Edinburgh: The Botanical Society of Edinburgh.
- Ekim T, Koyuncu M, Vural M, Duman H, Aytaç Z & Adıgüzel N (2000). *Türkiye Bitkileri Kırmızı Kitabı*. Ankara: Türkiye Tabiatını Koruma Derneği ve Van Yüzüncüyıl Üniversitesi Yayını, Barışcan Ofset.
- Fitter R, Fitter A & Blamey M (2000). *Parey Blumenbuch Blütenpflanzen Deutschlands und Nordwesteuropas*. Berlin: Parey Buchverlag, 3. Auflage.
- Godet JD (1991). *Pflanzen Europas Kräuter und Stauden*. München: Mosaik Verlag.
- Güner A, Özhatay N, Ekim T & Başer KHC (2000). *Flora of Turkey and the East Aegean Islands*. Vol. XI, Suppl.-II, Edinburgh: Edinburgh University Press.
- Harrington HD (1957). *How to Identify Plants*. Chicago: The Swallow Press Inc.
- Hegi G, Merxmüller H & Reissig H (1977). *Alpenflora*. Berlin und Hamburg: Verlag Paul Parey.
- IUCN (2001). *IUCN Red List Categories and Criteria: Version 3.1*. Prepared by the IUCN Species Survival Commission. IUCN Gland, Switzerland and Cambridge, UK.
- Kılınç M & Karakaya H, (1992). Çambaşı Yaylası (Ordu)'nun Subalpin ve Alpin Vejetasyonu Üzerine Fitososyolojik Bir Araştırma. *Turk J Bot* 16: 195-206.
- Komarov VL (1934-1978). *Flora of the U.S.S.R.*. Jerusalem: Israel Program for Scientific Translations, Vol. 1-30.

- Küçük M (1998). *Kürtün (Gümüşhane)-Örümcek Ormanlarının Florası ve Saf Meşcere Tiplerinin Floristik Kompozisyonu*. Trabzon: Trabzon İnkılap Matbaacılık Ltd. Şti., T.C. Orman Bakanlığı Doğu Karadeniz Ormanlık Araştırma Enstitüsü, Yayın No: 5.
- Lanzara P & Pizzetti M (1997). *Simon & Schuster's Guide to Trees*. New York: Simon & Schuster Inc.
- Öztan Y (1980). *Meryemana Deresi Havzasındaki Mera ve Orman Arazisinde Otlatmanın Değişik Etmenlerle İlişkili Olarak Fiziksel ve Hidrolojik Toprak Özellikleri Üzerindeki Etkileri*. Trabzon: Karadeniz Teknik Üniversitesi Orman Fakültesi Matbaası.
- Palabaş Uzun S & Anşin R (2006). Subalpine and Alpine Flora of Altındere Valley (Maçka, Trabzon). *Turk J Bot* 30: 381-398.

- Parris BS & Fraser-Jenkins CR (1980). *A Provisional Checklist of Turkish Pteridophyta*. Notes R.B.G. Edinburgh 38: 273-281.
- Phillips R (1994). *Grasses, Ferns, Mosses & Lichens of Great Britain and Ireland*. London: Macmillan Publishers Ltd., Second Edition.
- Polunin O (1969). *Flowers of Europe*. London: Oxford University Press.
- Terzioğlu S & Anşin R (2001). A Chorological Study on the Taxa Naturalized in the Eastern Black Sea Region. *Turk J Agric For* 25: 305-309.
- Wright M (1992). *The Complete Handbook of Garden Plants*. London: Michael Joseph Ltd., Fourth Impression.

Appendix

FLORISTIC LIST	ATHYRIACEAE	TAXACEAE
PTERIDOPHYTA	Matteucia struthiopteris (L.) Tod.	Taxus baccata L.
EQUISETACEAE	Sumela monastery surroundings, forest clearings, 1420 m, 05.05.2002, A. Uzun 464.	Sumela monastery surroundings, in <i>Picea-Fagus</i> forest, 1320 m, 07.09.2001, A. Uzun 423.
Equisetum arvense L.	ASPIDIACEAE	CUPRESSACEAE
Sumela monastery surroundings, moist soil, 1350 m, 26.06.2001, A. Uzun 221.	Dryopteris filix-mas (L.) Schott	Juniperus oxycedrus L. subsp. <i>oxycedrus</i>
E. telmateia Ehrh.	Sumela monastery surroundings, under forest, 1100 m, 09.06.2001, A. Uzun 144; Altındere village, under forest, 850 m, 12.09.2001, A.Uzun 444.	Coşandere village, with <i>Carpinus betulus</i> and <i>Quercus petraea</i> , 680 m, 20.05.2001, A. Uzun 34.
Sumela monastery surroundings, waste places, 1100 m, 27.05.2001, A. Uzun 73.	D. dilatata (Hoffm.) Gray	ANGIOSPERMAE
POLYPODIACEAE	Sumela monastery surroundings, under forest, 1150 m, 19.06.2001, A. Uzun 175.	DICOTYLEDONEAE
Polypodium vulgare L. subsp. <i>vulgare</i> L.	SPERMATOPHYTA	RANUNCULACEAE
Altındere village, under <i>Picea</i> forest, 775 m, 26.06.2001, A. Uzun 222; Coşandere village, rocky place in <i>Picea</i> forest, 630 m, 12.09.2001, A. Uzun 443.	GYMNOSPERMAE	Helleborus orientalis Lam.
ASPLENIACEAE	PINACEAE	Coşandere village, edge of forest, 500 m, 16.03.2001, A. Uzun 6, Eux.
Asplenium trichomanes L.	Abies nordmanniana (Stev.) Spach subsp. <i>nordmanniana</i>	Anemone blanda Schott & Kotschy
Sumela monastery surroundings, in rock crevices, wet places, 1100 m, 27.05.2001, A. Uzun 75.	Sumela monastery surroundings, mixed forest, 1450 m, 18.08.2001, A. Uzun 373, Eux.	Coşandere village, shady places, 620 m, 16.03.2001, A. Uzun 7.
A. adianthum-nigrum L.	Picea orientalis (L.) Link	Clematis vitalba L.
Coşandere village, under <i>Picea</i> forest, 630 m, 27.05.2001, A. Uzun 74; Coşandere village, under <i>Picea</i> forest, 650 m, 19.06.2001, A. Uzun 172.	Sumela monastery surroundings, as pure stands or mixed with other conifers and deciduous trees, 1100 m, 19.06.2001, A. Uzun 176, Eux.	Coşandere village, bushy place, 500 m, 13.04.2001, A. Uzun 13.
Phyllitis scolopendrium (L.) Newman	Pinus sylvestris L. var. <i>hamata</i> Steven	Ranunculus cappadocicus Willd.
Altındere village, rocky places, 750 m, 19.06.2001, A. Uzun 173; Coşandere village, under forest, 650 m, 19.06.2001, A. Uzun 174.	Seslikaya surroundings, rocky places, 1520 m, 05.05.2002, A. Uzun 465, Euro-Sib.	Sumela monastery surroundings, wet places, 1050 m, 05.05.2002, A. Uzun 466, Eux.
		R. repens L.
		Coşandere village, humid and marshy places, 550 m, 19.06.2001, A. Uzun 177.

R. bulbosus L. subsp. *aleae* (Willk.) Rouy & Foucaud

Sumela monastery surroundings, open places, 1240 m, 19.06.2001, A. Uzun 178, rare, VU.

R. constantinopolitanus (DC.) d'Urv.

Sumela monastery surroundings, open places, 1050 m, 27.05.2001, A. Uzun 76.

R. chius DC.

Sumela monastery surroundings, open places, 1050 m, 27.05.2001, A. Uzun 77.

Aquilegia olympica Boiss.

Sumela monastery surroundings, open forest, 1450 m, 20.06.2001, A. Uzun 217.

Thalictrum minus L. var. *majus* (Crantz) Crép.

Coşandere village, open forest, 530 m, 26.06.2001, A. Uzun 223.

PAEONIACEAE

Paeonia mascula (L.) Mill. subsp. *arietina* (Anders) Cullen & Heywood

Coşandere village, on upright rocky mass, 600 m, 05.05.2002, A. Uzun 468.

BERBERIDACEAE

Berberis vulgaris L.

Coşandere village, scrub in mixed forest, 580 m, 31.05.2001, A. Uzun 116.

Epimedium pinnatum Fisch. subsp. *colchicum* (Boiss.) Busch

Coşandere village, bushy places, 500 m, 20.05.2001, A. Uzun 35, rare, VU, Eux.

PAPAVERACEAE

Chelidonium majus L.

Coşandere village, in rock crevices, open forest, 510 m, 12.04.2001, A. Uzun 11; Coşandere village, open forest, 750 m, 12.04.2001, A. Uzun 12, Euro-Sib.

Papaver lateritium Koch

Sumela monastery surroundings, open forest, streamsides, 1580 m, 19.06.2001, A. Uzun 179, Endemic, VU, Eux.

P. rhoeas L.

Coşandere village, streamsides, 500 m, 09.06.2001, A. Uzun 145.

Corydalis caucasica DC.

Sumela monastery surroundings, wet places, streamsides, 1250 m, 07.03.2001, A. Uzun 4; Coşandere village, mixed forest, wet

and shady places, 596 m, 10.03.2002, A. Uzun 458, Eux.

Fumaria officinalis L.

Coşandere village, open forest, 560 m, 26.05.2002, A. Uzun 485.

F. cilicica Hausskn.

Coşandere village, open forest, 500 m, 09.06.2001, A. Uzun 146, Ir.-Tur.

BRASSICACEAE (Cruciferae)

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

Coşandere village, stony slopes, 550-560 m, 02.08.2001, A. Uzun 342; *ibid.*, 17.08.2001, A. Uzun 362; *ibid.*, 19.06.2001, A. Uzun 182, Ir.-Tur.

Pachyphragma macrophyllum (Hoffm.) Busch

Sumela monastery surroundings, under forest, 1100 m, 13.04.2001, A. Uzun 17, Eux.

Capsella bursa-pastoris (L.) Medik.

Coşandere village, pathway sides in forest, 500 m, 12.07.2001, A. Uzun 283, Cosm.

Alyssoides utriculata (L.) Medik.

Coşandere village, stony slopes, 600 m, 27.05.2001, A. Uzun 79.

Fibigia clypeata (L.) Medik.

Coşandere village, stony slopes, 580 m, 20.05.2001, A. Uzun 39.

Arabis hirsuta Scop.

Coşandere village, open forest, 630 m, 20.05.2001, A. Uzun 40; Coşandere village, roadsides, 570 m, 31.05.2001, A. Uzun 117.

Nasturtium officinale R.Br.

Coşandere village, in stream, 570 m, 31.05.2001, A. Uzun 118.

Barbarea plantaginea DC.

Coşandere village, wet slopes, 1100 m, 19.06.2001, A. Uzun 183.

Cardamine bulbifera (L.) Crantz

Sumela monastery surroundings, wet places, streamsides, 1030 m, 31.05.2001, A. Uzun 119, Euro-Sib.

C. quinquefolia (M.Bieb.) Schmalh.

Coşandere village, shady places, 596 m, 10.03.2002, A. Uzun 459, Euro-Sib.

C. raphanifolia Pourr.

Sumela monastery surroundings, wet places, streamsides, 1200 m, 19.06.2001, A. Uzun 184, Euro-Sib.

C. impatiens L. var. *impatiens*

Sumela monastery surroundings, marshy places, 1000 m, 09.06.2001, A. Uzun 152; *ibid.*, 12.07.2001, A. Uzun 284, Euro-Sib.

C. impatiens L. var. *pectinata* (Pall.) Trautv.

Sumela monastery surroundings, wet places, 1000 m, 09.06.2001, A. Uzun 153; *ibid.*, 12.07.2001, A. Uzun 285, Euro-Sib.

H. bicuspidata (Willd.) Poir.

Sumela monastery surroundings, open forest, 1350 m, 31.05.2001, A. Uzun 120.

Hesperis matronalis L. subsp. *matronalis*

Coşandere village, open forest, 600 m, 13.04.2001, A. Uzun 18.

H. matronalis L. subsp. *adzharica* (Tzvelev) Cullen

Sumela monastery surroundings, open forest, 1380 m, 19.06.2001, A. Uzun 185.

Erysimum deflexum Cullen

Sumela monastery surroundings, rocky crevices, 1350 m, 14.05.2002, A. Uzun 479,

Endemic, CR, Eux. (mt.), Only known from the type locality.

Alliaria petiolata (M.Bieb.) Cavara & Grande

Coşandere village, shady places, open forest, 500 m, 31.05.2001, A. Uzun 121; Sumela monastery surroundings, wet slopes, 1050 m, 31.05.2001, A. Uzun 489.

RESEDACEAE

Reseda lutea L. var. *lutea*

Coşandere village, open forest, 700 m, 20.05.2001, A. Uzun 41.

CISTACEAE

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

Coşandere village, stony slopes, rocky places, 670 m, 20.05.2001, A. Uzun 37.

VIOLACEAE

Viola odorata L.

Altındere village, roadsides, 845 m, 13.04.2001, A. Uzun 14.

V. suavis M.Bieb.
Altındere village, open forest, 845 m, 13.04.2001, A. Uzun 15.

V. sieheana Becker
Coşandere village, under forest, 640 m, 13.04.2001, A. Uzun 16.

POLYGALACEAE
Polygala major Jacq.
Coşandere village, stony roadsides, slopes, 600 m, 12.07.2001, A. Uzun 292, Euro-Sib.

CARYOPHYLLACEAE
Stellaria holostea L.
Sumela monastery surroundings, shady places, 1245 m, 27.05.2001, A. Uzun 78, Euro-Sib.

Dianthus carmelitarum Reut. ex Boiss.
Coşandere village, stony slopes, open forest, 630 m, 09.06.2001, A. Uzun 150; Coşandere village, roadsides, 580 m, 19.06.2001, A. Uzun 180, Endemic, LR (lc), Eux.

D. carthusianorum L.
Coşandere village, stony slopes, 615 m, 23.10.2001, A. Uzun 456.

Petrorhagia saxifraga (L.) Link
Coşandere village, roadsides, rocky places, 545 m, 02.08.2001, A. Uzun 340, Euro-Sib.

Silene italica (L.) Pers.
Coşandere village, open forest, 500 m, 20.05.2001, A. Uzun 36.

S. compacta Fisch.
Altındere village, in forest, roadsides, 870 m, 12.07.2001, A. Uzun 278.

S. alba (Mill.) Krause subsp. *divaricata* (Rchb.) Walters
Coşandere village, in deciduous forest, 500 m, 26.06.2001, A. Uzun 224.

S. alba (Mill.) Krause subsp. *ericalcyna* (Boiss.) Walters
Coşandere village, open forest, 650 m, 19.06.2001, A. Uzun 181.

S. dichotoma Ehrh. subsp. *dichotoma*
Coşandere village, rocky slopes, 630 m, 26.06.2001, A. Uzun 225.

POLYGONACEAE
Polygonum persicaria L.
Coşandere village, wet places, 540 m, 02.08.2001, A. Uzun 341.

Rumex acetosella L.
Sumela monastery surroundings, shady places under forest, 1100 m, 12.07.2001, A. Uzun 279.

CHENOPODIACEAE
Chenopodium album L. subsp. *album* var. *album*
Coşandere village, roadsides, 500 m, 17.08.2001, A. Uzun 361.

CLUSIACEAE (Guttiferae)
Hypericum androsaemum L.
Altındere village, roadside slopes, 880 m, 09.06.2001, A. Uzun 151, Euro-Sib.

H. bithynicum Boiss.
Altındere village, slopes in forest, 825 m, 12.07.2001, A. Uzun 280; Coşandere village, roadsides in forest, 500 m, 12.07.2001, A. Uzun 281, Eux.

H. orientale L.
Coşandere village, stony slopes, 650 m, 07.09.2001, A. Uzun 428.

H. perforatum L.
Coşandere village, open forest, 550 m, 26.06.2001, A. Uzun 226; Altındere village, open forest, 850 m, 12.07.2001, A. Uzun 282.

MALVACEAE
Malva sylvestris L.
Coşandere village, open places, 565 m, 26.06.2001, A. Uzun 227.

TILIACEAE
Tilia rubra DC. subsp. *caucasica* (Rupr.) V.Engl.
Sumela monastery surroundings, with deciduous forest, 1210 m, 14.05.2002, A. Uzun 477, Eux.

LINACEAE
Linum aroanium Boiss. & Orph.
Coşandere village, forest clearings, 630 m, 20.05.2001, A. Uzun 50.

L. tenuifolium L.
Coşandere village, forest clearings, 710 m, 20.05.2001, A. Uzun 51.

L. bienne Mill.
Coşandere village, forest clearings, 630 m, 12.07.2001, A. Uzun 291, Medit.

GERANIACEAE
Geranium lucidum L.
Coşandere village, in forest, 610 m, 27.05.2001, A. Uzun 96.

G. robertianum L.
Sumela monastery surroundings, streamsides, rock crevices, 500-1200 m, 27.05.2001, A. Uzun 97; *ibid.*, 12.07.2001, A. Uzun 293.

G. columbinum L.
Altındere village, stony places, 775 m, 12.07.2001, A. Uzun 294.

G. sylvaticum L.
Sumela monastery surroundings, forest, 1040-1450 m, 19.06.2001, A. Uzun 195; *ibid.*, 13.07.2001, A. Uzun 332, Euro-Sib.

G. pyrenaicum Burm.
Coşandere village, forest, 630 m, 20.05.2001, A. Uzun 55; Altındere village, forest, 780-900 m, 26.06.2001, A. Uzun 243; *ibid.*, 12.07.2001, A. Uzun 295.

G. gracile Ledeb. ex Nordm.
Altındere village, forest, 775 m, 26.06.2001, A. Uzun 244; Sumela monastery surroundings, forest, 1050 m, 12.07.2001, A. Uzun 296, Hyr.-Eux.

OXALIDACEAE
Oxalis acetosella L.
Sumela monastery surroundings, shady places, 1200 m, 27.05.2001, A. Uzun 94.

O. corniculata L.
Sumela monastery surroundings, forest clearings, 1130 m, 27.05.2001, A. Uzun 95, Cosm.

BALSAMINACEAE
Impatiens noli-tangere L.
Sumela monastery surroundings, shady places, 1300 m, 18.08.2001, A. Uzun 377, Euro-Sib.

RUTACEAE
Dictamnus albus L.
Coşandere village, deciduous forest, 500-630 m, 20.05.2001, A. Uzun 54; *ibid.*, 31.05.2001, A. Uzun 127.

ACERACEAE

Acer trautvetteri Medw.

Sumela monastery surroundings, mixed forest, 1050-1445 m, 07.09.2001, A. Uzun 435; *ibid.*, 12.09.2001, A. Uzun 449, Eux.

A. cappadocicum Gled. var. *cappadocicum*

Sumela monastery surroundings, mixed forest, 1200 m, 21.08.2001, A. Uzun 395,

Hyr.-Eux.

A. cappadocicum Gled. var. *stenocarpum* Yalt.

Coşandere village, deciduous forest, 620 m, 20.05.2001, A. Uzun 52, endemic, VU, Eux.

A. platanoides L.

Sumela monastery surroundings, mixed forest, 1150 m, 12.09.2001, A. Uzun 450,

Euro-Sib.

A. campestre L. subsp. *campestre*

Coşandere village, forest clearings, 533 m, 29.08.2001, A. Uzun 414.

A. campestre L. subsp. *lasiocarpum* (Opiz) Pax

Coşandere village, deciduous forest, 630 m, 20.05.2001, A. Uzun 53, Euro-Sib.

STAPHYLEACEAE

Staphylea pinnata L.

Sumela monastery surroundings, mixed forest, 1100 m, 27.05.2001, A. Uzun 93; Coşandere village, deciduous forest, 500 m, 12.09.2001, A. Uzun 448, Euro-Sib.

RHAMNACEAE

Frangula alnus Mill. subsp. *alnus*

Coşandere village, forest, 630 m, 20.05.2001, A. Uzun 49, Euro-Sib.

AQUIFOLIACEAE

Ilex colchica Pojark.

Sumela monastery surroundings, *Picea* forest, 1030 m, 27.05.2001, A. Uzun 92,

Eux.

CELASTRACEAE

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

Sumela monastery surroundings, forest, 1150 m, 12.09.2001, A. Uzun 446.

E. europaeus L.

Altındere village, scrub, 900 m, 26.06.2001, A. Uzun 241; Sumela monastery surroundings, forest, 1200 m, 26.06.2001, A. Uzun 242, Euro-Sib.

FABACEAE (Leguminosae)

Genista tinctoria L.

Coşandere village, stony slopes, 700 m, 13.04.2001, A. Uzun 20, Euro-Sib.

Robinia pseudoacacia L.

Sumela monastery surroundings, sunny slopes in forest, 1300 m, 07.09.2001, A. Uzun 432, alien.

Astragalus lineatus Lam. var. *lineatus*

Sumela monastery surroundings, stony and grassy places, 1300 m, 07.09.2001, A. Uzun 433.

Psoralea bituminosa L.

Coşandere village, open forest, 740 m, 26.06.2001, A. Uzun 233, Medit.

Vicia crocea (Desf.) B.Fedtsch.

Sumela monastery surroundings, in deciduous forest, 1200 m, 20.05.2001, A. Uzun 46,

Hyr.-Eux.

V. cassubica L.

Coşandere village, open forest, 630 m, 20.07.2001, A. Uzun 336, Euro-Sib.

V. sepium L.

Coşandere village, open forest, streamsides, 600 m, 07.09.2001, A. Uzun 434,

Euro-Sib.

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

Coşandere village, roadsides, clearings, 515 m, 27.05.2001, A. Uzun 85; *ibid.*, 26.06.2001, A. Uzun 234.

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

Coşandere village, open forest, 630 m, 27.05.2001, A. Uzun 86.

L. roseus Stev.

Coşandere village, forest, 630 m, 20.05.2001, A. Uzun 47,

Hyr.-Eux.

L. nissolia L.

Coşandere village, under mixed forest, 630 m, 31.05.2001, A. Uzun 126

Trifolium repens L. var. *repens*

Coşandere village, open areas, fields, 550 m, 26.06.2001, A. Uzun 235.

T. campestre Schreb.

Coşandere village, grassy slopes, 500-550 m, 19.06.2001, A. Uzun 188; *ibid.*, 12.07.2001, A. Uzun 289.

T. pratense L. var. *pratense*

Coşandere village, forest clearings, 550 m, 26.06.2001, A. Uzun 236.

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

Altındere village, forest clearings, 790 m, 27.05.2001, A. Uzun 87.

T. medium L. var. *medium*

Altındere village, forest clearings, 1530 m, 12.09.2001, A. Uzun 445.

T. ochroleucum Huds.

Coşandere village, forest clearings, 500 m, 19.06.2001, A. Uzun 189.

Melilotus officinalis (L.) Desr.

Coşandere village, forest clearings, 500 m, 19.06.2001, A. Uzun 190.

Medicago falcata L.

Coşandere village, scrub, 500 m, 19.06.2001, A. Uzun 191.

Dorycnium graecum (L.) Ser.

Coşandere village, roadsides, bushy places, 500 m, 12.07.2001, A. Uzun 290,

Eux.

Lotus corniculatus L. var. *corniculatus*

Coşandere village, open forest, 513 m, 27.05.2001, A. Uzun 88.

Coronilla orientalis Mill. var. *orientalis*

Coşandere village, stony places, 510 m, 27.05.2001, A. Uzun 89.

C. varia L. subsp. *varia*

Coşandere village, open forest, rocky place, 550 m, 19.06.2001, A. Uzun 192.

ROSACEAE

Aruncus vulgaris Raf.

Sumela monastery surroundings, roadsides in forest, 1150-1300 m, 09.06.2001, A. Uzun 159; *ibid.*, 18.08.2001, A. Uzun 376, Euro-Sib.

Laurocerasus officinalis Roem.

Sumela monastery surroundings, streamsides in forest, 1420 m, 31.05.2001, A. Uzun 122, Eux.

Prunus x domestica L.

Coşandere village, in forest, 580 m, 05.05.2002, A. Uzun 469.

Cerasus avium (L.) Moench

Coşandere village, in forest, 630 m, 20.05.2001, A. Uzun 44.

Rubus idaeus L.

Sumela monastery surroundings, by the river in forest clearings, 1350 m, 09.06.2001, A. Uzun 160.

R. discolor Weihe & Nees

Coşandere village, in forest, 610 m, 20.05.2001, A. Uzun 45.

R. hirtus Waldst. & Kit.

Sumela monastery surroundings, open forest, 1200 m, 09.06.2001, A. Uzun 161, Eux.

R. caucasicus Focke

Coşandere village, roadsides, 500 m, 09.06.2001, A. Uzun 162, Eux.

Potentilla argentea L.

Altındere village, in forest, 790 m, 27.05.2001, A. Uzun 490; Coşandere village, in forest, 500 m, 31.05.2001, A. Uzun 123.

P. reptans L.

Coşandere village, wet and humid places, streamsides, 550 m, 31.05.2001, A. Uzun 124; *ibid.*, 550 m, 26.06.2001, A. Uzun 232.

P. elatior Willd. ex Schldl.

Sumela monastery surroundings, forest, wet places, 1220 m, 12.07.2001, A. Uzun 286,

Eux.

P. micrantha Ramond ex. DC.

Coşandere village, forest, 600 m, 27.05.2001, A. Uzun 80.

Fragaria vesca L.

Coşandere village, grassy slopes, forest clearings, 600 m, 27.05.2001, A. Uzun 81.

Geum urbanum L.

Sumela monastery surroundings, shady places, 1100 m, 27.05.2001, A. Uzun 82;

Coşandere village, open forest, 500 m, 09.06.2001, A. Uzun 163, Euro-Sib.

Agrimonia eupatoria L.

Coşandere village, forest clearings, 500 m, 12.07.2001, A. Uzun 287.

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

Coşandere village, roadsides, forest clearings, 550 m, 20.06.2001, A. Uzun 218.

Alchemilla sintenisii Rothm.

Sumela monastery surroundings, open forest, 1230 m, 12.07.2001, A. Uzun 288,

Endemic, LR (nt), Eux. (mt.)

A. barbatiflora Juz.

Sumela monastery surroundings, open forest, 1050 m, 31.05.2001, A. Uzun 125, Eux.

Rosa canina L.

Altındere village, open forest, 720 m, 27.05.2001, A. Uzun 83.

Mespilus germanica L.

Coşandere village, forest, 533 m, 29.08.2001, A. Uzun 412; Sumela monastery surroundings, forest, 1200 m, 07.09.2001, A. Uzun 430, Hyr.-Eux.

Crataegus curvisepala Lindm.

Altındere village, open forest, 790 m, 27.05.2001, A. Uzun 84.

Sorbus aucuparia L.

Sumela monastery surroundings, forest, 1420 m, 22.09.2001, A. Uzun 455, Euro-Sib.

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

Coşandere village, forest, 630 m, 07.09.2001, A. Uzun 431.

ONAGRACEAE

Circaea lutetiana L.

Sumela monastery surroundings, open *Picea* forest, streamsides, 1450 m, 21.08.2001, A. Uzun 394.

Epilobium montanum L.

Sumela monastery surroundings, forest clearings, streamsides, 1460 m, 24.07.2001, A. Uzun 339, Euro-Sib.

E. ponticum Hausskn.

Sumela monastery surroundings, streamsides, 1350-1500 m, 19.06.2001, A. Uzun 193; *ibid.*, 26.06.2001, A. Uzun 237.

CRASSULACEAE

Sedum stoloniferum C.C.Gmel.

Altındere village, in *Picea* forest, 840 m, 26.06.2001, A. Uzun 229; Sumela monastery surroundings, in *Picea* forest, 1300 m, 19.06.2001, A. Uzun 187, Hyr.-Eux. (mt.)

S. album L.

Coşandere village, rocky places, 530 m, 09.06.2001, A. Uzun 156; *ibid.*, 26.06.2001, A. Uzun 230.

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

Coşandere village, clearings, rocky places, 530 m, 26.06.2001, A. Uzun 231, Eux.

Sempervivum minus Turriill var. **minus**

Coşandere village, rocky places, 680 m, 20.05.2001, A. Uzun 43,

Endemic, LC.

SAXIFRAGACEAE

Saxifraga paniculata Mill. subsp. **paniculata**

Sumela monastery surroundings, stony slopes, rocky crevices, 1250 m, 09.06.2001, A. Uzun 157, Euro-Sib.

S. rotundifolia L.

Coşandere village, wet and rocky places, 590 m, 14.05.2002, A. Uzun 480, Euro-Sib.

S. cymbalaria L. var. **cymbalaria**

Sumela monastery surroundings, rocky places, 1120 m, 09.06.2001, A. Uzun 158.

GROSSULARIACEAE

Ribes biebersteinii Berl. ex DC.

Sumela monastery surroundings, in forest, 1480 m, 24.07.2001, A. Uzun 337, Eux.

R. alpinum L.

Sumela monastery surroundings, in forest, 1200 m, 24.07.2001, A. Uzun 338; *ibid.*, 24.07.2001, A. Uzun 491,

Euro-Sib.

APIACEAE (Umbelliferae)***Sanicula europaea* L.**

Sumela monastery surroundings, *Picea* forest, 1050 m, 31.05.2001, A. Uzun 128, Euro-Sib.

***Eryngium giganteum* M.Bieb.**

Sumela monastery surroundings, open forest, 1400 m, 21.08.2001, A. Uzun 396, Eux.

***Chaerophyllum aureum* L.**

Altındere village, open forest, 790 m, 27.05.2001, A. Uzun 99.

***Scaligeria tripartita* (Kalen.) Tamamsch.**

Sumela monastery surroundings, *Picea* forest, 1200 m., 27.05.2001, A. Uzun 100; Coşandere village, mixed forest, 700 m, 31.05.2001, A. Uzun 129, Eux.

***Pimpinella rhodantha* Boiss.**

Altındere village, open forest, grassy places, 840 m, 13.07.2001, A. Uzun 333

***Oenanthe silaifolia* M.Bieb.**

Coşandere village, open forest, grassy places, 538 m, 02.08.2001, A. Uzun 344.

***Aethusa cynapium* L.**

Altındere village, field margins, 760 m, 17.08.2001, A. Uzun 363, Euro-Sib.

***Foeniculum vulgare* Mill.**

Altındere village, roadsides, 750 m, 26.06.2001, A. Uzun 245.

***Physospermum cornubiense* (L.) DC.**

Coşandere village, open forest, 530 m, 26.06.2001, A. Uzun 246; Altındere village, roadsides, 850 m, 12.07.2001, A. Uzun 297.

Angelica sylvestris* L. var. *sylvestris

Coşandere village, open forest, 650 m, 12.09.2001, A. Uzun 451, Euro-Sib.

***Heracleum sphondylium* L. subsp. *cyclocarpum* (C.Koch) P.H.Davis**

Coşandere village, open forest, 530 m, 26.06.2001, A. Uzun 245, Eux.

***H. plathytaenium* Boiss.**

Coşandere village, open deciduous forest, 500-550 m, 19.06.2001, A. Uzun 196; *ibid.*, 26.06.2001, A. Uzun 248,

Endemic, LR (Ic), Eux.

***Laser trilobum* (L.) Borkh.**

Coşandere village, roadsides, 500 m, 19.06.2001, A. Uzun 197; *ibid.*, 26.06.2001, A. Uzun 249.

***Caucalis platycarpus* L.**

Coşandere village, forest clearings, 538 m, 02.08.2001, A. Uzun 345.

***Orlaya daucooides* (L.) Greuter**

Coşandere village, field margins, 500-550 m, 27.05.2001, A. Uzun 101; *ibid.*, 31.05.2001, A. Uzun 130, Medit.

***O. grandiflora* (L.) Hoffm.**

Altındere village, field margins, 760-800 m, 26.06.2001, A. Uzun 250; *ibid.*, 26.06.2001, A. Uzun 251.

Daucus carota* L. subsp. *carota

Coşandere village, field margins, 500 m, 17.08.2001, A. Uzun 364; Altındere village, open areas, 800 m, 18.08.2001, A. Uzun 378.

ARALIACEAE***Hedera helix* L.**

Coşandere village, on rocks and trees, 650 m, 17.02.2001, A. Uzun 2.

***H. colchica* (C.Koch) C.Koch**

Sumela monastery surroundings, on trees in *Picea* forest, 1000-1100 m, 27.05.2001, A. Uzun 98; *ibid.*, 09.06.2001, A. Uzun 164; *ibid.*, 09.08.2001, A. Uzun 359, Eux.

CORNACEAE

***Cornus sanguinea* L. subsp. *cilicica* (Wangerin) Chamb.**

Altındere village, in deciduous forest, 775 m, 26.06.2001, A. Uzun 239; Coşandere village, forest, 500-550 m, 27.05.2001, A. Uzun 91; *ibid.*, 29.08.2001, A. Uzun 413,

Medit.

***C. mas* L.**

Coşandere village, in deciduous forest, 775 m, 26.06.2001, A. Uzun 238, Euro-Sib.

CAPRIFOLIACEAE***Sambucus ebulus* L.**

Coşandere village, open forest, 513 m, 02.08.2001, A. Uzun 354, Euro-Sib.

***S. nigra* L.**

Sumela monastery surroundings, *Picea* forest, 1150 m, 31.05.2001, A. Uzun 138, Euro-Sib.

***Viburnum orientale* Pall.**

Sumela monastery surroundings, forest, 1300 m, 07.09.2001, A. Uzun 437, Eux.

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

Sumela monastery surroundings, forest, 1100 m, 20.05.2001, A. Uzun 62; Sumela monastery surroundings, deciduous forest, 1420 m, 21.08.2001, A. Uzun 403,

Endemic, LR (Ic).

***L. xylosteum* L.**

Coşandere village, in forest, rocky place, 550-600 m, 07.09.2001, A. Uzun 438; *ibid.*, 07.09.2001, A. Uzun 439, Euro-Sib.

VALERIANACEAE***Valeriana alliarifolia* Adams**

Sumela monastery surroundings, forest, 1300 m, 12.07.2001, A. Uzun 314, Euro-Sib.

***V. alpestris* Stev.**

Sumela monastery surroundings, forest, 1300 m, 12.07.2001, A. Uzun 315, Eux. (mt.)

***Valerianella dentata* (L.) Pollich**

Coşandere village, field banks, 500 m, 17.08.2001, A. Uzun 369, Ir.-Tur.

DIPSACACEAE***Dipsacus pilosus* L.**

Sumela monastery surroundings, roadsides, 1300 m, 18.08.2001, A. Uzun 387.

Euro-Sib.

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

Sumela monastery surroundings, roadsides, stony places 1500 m, 12.07.2001, A. Uzun 316.

ASTERACEAE (Compositae)***Telekia speciosa* (Schreb.) Baumg.**

Sumela monastery surroundings, streamsides, deciduous forest, 1030 m, 21.08.2001, A. Uzun 404, Euro-Sib.

- Inula vulgaris* (Lam.) Trevis.
Sumela monastery surroundings, forest clearings, 900 m, 17.08.2001, A. Uzun 370, Euro-Sib.
- Solidago virgaurea* L. subsp. *alpestris* (Waldst. & Kit.) Gaudin
Sumela monastery surroundings, in forest, 1300-1450 m, 18.08.2001, A. Uzun 388; *ibid.*, 21.08.2001, A. Uzun 405; *ibid.*, 29.08.2001, A. Uzun 419, Euro-Sib.
- Erigeron annuus* (L.) Pers.
Altındere village, forest clearings, streamside, along roadsides, 775-850 m, 26.06.2001, A. Uzun 268; *ibid.*, 12.07.2001, A. Uzun 317, alien.
- Conyza canadensis* (L.) Cronquist
Coşandere village, roadsides, 510-540 m, 02.08.2001, A. Uzun 355; *ibid.*, 17.08.2001, A. Uzun 371, alien.
- Bellis perennis* L.
Coşandere village, wet places, 500 m, 27.05.2001, A. Uzun 108.
- Doronicum orientale* Hoffm.
Coşandere village, wet places, 680 m, 09.06.2001, A. Uzun 171.
- Senecio pandurifolius* C.Koch
Coşandere village, rocky places, 620 m, 05.05.2002, A. Uzun 471, Eux.
- S. vulgaris* L.
Coşandere village, fields, roadsides, 550 m, 13.04.2001, A. Uzun 25.
- Tussilago farfara* L.
Altındere village, wet slopes, 850 m, 13.04.2001, A. Uzun 26, Euro-Sib.
- Petasites albus* (L.) Gaertn.
Sumela monastery surroundings, wet places, 1350 m, 20.05.2001, A. Uzun 63, Euro-Sib.
- Anthemis tinctoria* L. var. *pallida* DC.
Altındere village, wet places, 800 m, 18.08.2001, A. Uzun 389.
- Leucanthemum vulgare* Lam.
Altındere village, open forest, 850 m, 12.07.2001, A. Uzun 318, Euro-Sib.
- Tanacetum sorbifolium* (Boiss.) Grierson
Sumela monastery surroundings, roadsides, 1450 m, 21.08.2001, A. Uzun 406, Eux.
- T. poteriifolium* (Ledeb.) Grierson
Coşandere village, roadside in forest, 500-560 m, 31.05.2001, A. Uzun 139; *ibid.*, 19.06.2001, A. Uzun 208, Eux.
- T. parthenium* (L.) Sch.Bip.
Altındere village, roadsides, 778 m, 22.06.2001, A. Uzun 220, Cosm.
- Tripleurospermum oreades* (Boiss.) Rech. var. *tchihatchewii* (Boiss.) E.Hossain
Coşandere village, rocky place, 630-720 m, 13.04.2001, A. Uzun 27; *ibid.*, 20.05.2001, A. Uzun 64; *ibid.*, 20.05.2001, A. Uzun 65.
- Cirsium trachylepis* Boiss.
Coşandere village, roadsides, 500-550 m, 19.06.2001, A. Uzun 209; *ibid.*, 29.08.2001, A. Uzun 420, endemic, VU, Eux.
- C. vulgare* (Savi) Ten.
Sumela monastery surroundings, open forest, 1200-1300 m, 02.08.2001, A. Uzun 356; *ibid.*, 18.08.2001, A. Uzun 390.
- C. arvense* (L.) Scop. subsp. *vestitum* (Wimm. & Grab.) Petr.
Coşandere village, roadsides, 530 m, 12.07.2001, A. Uzun 319.
- Centaurea jacea* L.
Altındere village surroundings, stony slopes, 840 m, 12.07.2001, A. Uzun 320; Sumela monastery surroundings, roadsides, 1040 m, 29.08.2001, A. Uzun 421, Euro-Sib.
- C. salicifolia* M.Bieb. ex Willd. subsp. *abbreviata* C.Koch
Altındere village surroundings, stony slopes, 840 m, 18.07.2001, A. Uzun 335, Eux.
- C. hypoleuca* DC.
Coşandere village surroundings, open forest, 560 m, 26.06.2001, A. Uzun 269, Eux.
- Echinops galaticus* Freyn.
Coşandere village surroundings, open forest, 600 m, 18.08.2001, A. Uzun 391, Eux.
- Cichorium intybus* L.
Altındere village surroundings, roadsides, 815 m, 12.07.2001, A. Uzun 321, Cosm.
- Leontodon hispidus* L. var. *glabratus* (W.Koch) Bisch.
Coşandere village surroundings, rocky places, 500 m, 19.06.2001, A. Uzun 210; *ibid.*, 26.06.2001, A. Uzun 270.
- Sonchus asper* (L.) Hill subsp. *glaucescens* (Jord.) Ball
Coşandere village surroundings, open places, 510-630 m, 20.05.2001, A. Uzun 66; *ibid.*, 27.05.2001, A. Uzun 109.
- Hieracium gentiliforme* (Zahn) P.D.Sell & West
Coşandere village surroundings, forest, 510 m, 27.05.2001, A. Uzun 110, Endemic, VU, Eux.
- H. erythrocarpum* Peter
Sumela monastery surroundings, in forest, 1050 m, 31.05.2001, A. Uzun 140, Euro-Sib.
- H. asterodermum* (Woronow & Zahn) Juxip
Sumela monastery surroundings, open forest, 1100 m, 27.05.2001, A. Uzun 111, rare, DD, Eux.
- Pilosella hoppeana* (Schult.) Sch. Bip. & F.W.Schultz subsp. *troica* (Zahn) P.D.Sell & West
Altındere village surroundings, open forest, 790 m, 27.05.2001, A. Uzun 112.
- Prenanthes cacaliifolia* (M.Bieb.) Beauverd
Sumela monastery surroundings, *Picea* forest, 1400-1450 m, 21.08.2001, A. Uzun 407; *ibid.*, 12.09.2001, A. Uzun 452, Eux.
- Mycelis muralis* (L.) Dumort.
Altındere village, forest, 775 m, 26.06.2001, A. Uzun 271, Euro-Sib.
- Lapsana communis* L. subsp. *intermedia* (M.Bieb.) Hayek
Coşandere village, open area, 500-550 m, 19.06.2001, A. Uzun 211; *ibid.*, 26.06.2001, A. Uzun 272; Sumela monastery surroundings, open area, 1000 m, 29.08.2001, A. Uzun 422.
- Taraxacum scaturiginosum* G.E.Haglund
Coşandere village surroundings, forest clearings, 560 m, 10.03.2002, A. Uzun 460.

CAMPANULACEAE

Campanula latifolia L.

Altındere village, open forest, 900 m, 26.06.2001, A. Uzun 266,

Euro-Sib.

C. rapunculoides L. subsp. *rapunculoides*

Coşandere village, *Picea* forest, 550 m, 19.06.2001, A. Uzun 204, Euro-Sib.

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

Coşandere village, *Picea* forest, 600 m, 19.06.2001, A. Uzun 205.

C. alliariifolia Willd.

Altındere village, open forest, 780 m, 26.06.2001, A. Uzun 267, Eux.

C. betulifolia C.Koch

Altındere village, rock crevices, 870 m, 19.06.2001, A. Uzun 206; Sumela monastery surroundings, rock crevices, 1370 m, 21.08.2001, A. Uzun 402, endemic, LR (lc), Eux.

C. lactiflora M.Bieb.

Sumela monastery surroundings, *Picea* forest, 1300 m, 18.08.2001, A. Uzun 384; Altındere village, *Picea* forest, 960 m, 18.08.2001, A. Uzun 385, Eux.

C. olympica Boiss.

Coşandere village, *Picea* forest, 500-630 m, 20.05.2001, A. Uzun 61; *ibid.*, 19.06.2001, A. Uzun 207; Altındere village, *Picea* forest, 830 m, 12.07.2001, A. Uzun 312, Eux.

ERICACEAE

Rhododendron luteum Sweet

Altındere village, in forest, 850 m, 26.06.2001, A. Uzun 228, Eux.

R. ponticum L. subsp. *ponticum*

Sumela monastery surroundings, in forest, 1320 m, 20.05.2001, A. Uzun 42, Eux.

Vaccinium arctostaphylos L.

Sumela monastery surroundings, in *Picea* forest, 1450 m, 19.06.2001, A. Uzun 186, Eux.

PRIMULACEAE

Primula vulgaris Huds. subsp. *vulgaris*

Sumela monastery surroundings, meadows, 1050 m, 13.04.2001, A. Uzun 19, Euro-Sib.

Cyclamen coum Mill. var. *coum*

Coşandere village, in deciduous forest, 550 m, 17.03.2001, A. Uzun 8.

C. coum Mill. var. *caucasicum* (C.Koch) Meikle

Coşandere village, in forest, 530 m, 17.03.2001, A. Uzun 10.

C. parviflorum Pobed.

Altındere village, mossy places on rocks, 855 m, 05.05.2001, A. Uzun 32; Sumela monastery surroundings, open forest, stony slopes, 1200 m, 05.04.2002, A. Uzun 462,

endemic, VU, Eux. (mt.)

Lysimachia verticillaris Spreng.

Sumela monastery surroundings, wet places, streamsides, 1250 m, 07.08.2001, A. Uzun 358, Hyr.-Eux.

Anagallis arvensis L. var. *arvensis*

Coşandere village, wet and stony slopes, 540 m, 09.06.2001, A. Uzun 154.

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

Coşandere village, open deciduous forest, 650 m, 09.06.2001, A. Uzun 155.

EBENACEAE

Diospyros lotus L.

Coşandere village, edge of forest, 680 m, 07.09.2001, A. Uzun 429.

OLEACEAE

Ligustrum vulgare L.

Sumela monastery surroundings, bushy places, 1100 m, 21.08.2001, A. Uzun 401, Euro-Sib.

Osmanthus decorus (Boiss. & Balansa) Kasapligil

Coşandere village, streamsides, 568 m, 17.02.2002, A. Uzun 457,

Rare, VU, Eux.

APOCYNACEAE

Vinca major L. subsp. *hirsuta* (Boiss.) Stearn

Sumela monastery surroundings, *Picea* forest, 1100 m, 21.08.2001, A. Uzun 398, Eux.

ASCLEPIADACEAE

Vincetoxicum scandens Sommier & Levier

Altındere Village, open forest, 776 m, 26.06.2001, A. Uzun 252, Hyr.-Eux.

GENTIANACEAE

Gentiana asclepiadea L.

Sumela monastery surroundings, *Picea* forest, 1100 m, 21.08.2001, A. Uzun 397,

Euro-Sib.

CONVOLVULACEAE

Convolvulus cantabrica L.

Coşandere village, forest, 570 m, 31.05.2001, A. Uzun 131.

C. arvensis L.

Coşandere village, open places, 550-630 m, 26.06.2001, A. Uzun 253; *ibid.*, 12.07.2001, A. Uzun 298,

Cosm.

Calystegia silvatica (Kit.) Griseb.

Altındere village, wet places, 785 m, 26.06.2001, A. Uzun 254.

BORAGINACEAE

Lappula barbata (M.Bieb.) Gürke

Coşandere village, forest, 500 m, 17.08.2001, A. Uzun 366, Ir.-Tur.

Myosotis heteropoda Trautv.

Altındere village, stony places, 790 m, 27.05.2001, A. Uzun 102, Ir.-Tur.

M. arvensis (L.) Hill subsp. *arvensis*

Coşandere village, forest, 630 m, 20.05.2001, A. Uzun 56, Euro-Sib.

M. lazica Popov.

Sumela monastery surroundings, wet places, 1300-1400 m, 18.08.2001, A. Uzun 380; *ibid.*, 21.08.2001, A. Uzun 399; Altındere village, wet places, 900 m, 12.07.2001, A. Uzun 299, rare, VU, Eux.

M. lithospermifolia (Willd.) Hornem.

Sumela monastery surroundings, forest clearings, 1350 m, 13.04.2001, A. Uzun 22.

Echium italicum L.

Altındere village, open places, 834 m, 12.07.2001, A. Uzun 300, Medit.

E. vulgare L.

Altındere village, open places, 810 m, 17.08.2001, A. Uzun 367, Euro-Sib.

Onosma ambigens Lacaita

Coşandere village, stony slopes, 680 m, 20.05.2001, A. Uzun 57, endemic, LR (lc),

Ir.-Tur.

Symphytum asperum Lepech.

Coşandere village, streamsides, 570 m, 27.05.2001, A. Uzun 103, Hyr.-Eux.

Trachystemon orientalis (L.) G.Don

Sumela monastery surroundings, forest, 1100 m, 13.04.2001, A. Uzun 23, Eux.

SOLANACEAE

Solanum nigrum L. subsp. *schultesii* (Opiz) Wessely

Coşandere village, roadsides, 610 m, 17.08.2001, A. Uzun 365.

Physalis alkekengi L.

Coşandere village, streamsides, 545 m, 29.08.2001, A. Uzun 415.

Atropa belladonna L.

Sumela monastery surroundings, open forest, 1300 m, 18.08.2001, A. Uzun 379,

Euro-Sib.

SCROPHULARIACEAE

Verbascum speciosum Schrad.

Altındere village, roadsides, 795 m, 09.06.2001, A. Uzun 165.

V. gnaphalodes M.Bieb.

Altındere village, roadsides, 700 m, 19.06.2001, A. Uzun 200; Coşandere village, roadsides, 650 m, 19.06.2001, A. Uzun 201, Eux.

Scrophularia chrysantha Jaub. & Spach

Sumela monastery surroundings, rocky places, 1450 m, 17.04.2002, A. Uzun 463, Eux.

S. kotschyana Benth.

Sumela monastery surroundings, bottom of rocky mass, shady places, 1400 m, 13.04.2001, A. Uzun 24.

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

Sumela monastery surroundings, open forest, 1050 m, 31.05.2001, A. Uzun 134, Eux.

Linaria genistifolia (L.) Mill. subsp. *genistifolia*

Coşandere village, rocky place, 650-850 m, 29.08.2001, A. Uzun 418; *ibid.*, 20.05.2001, A. Uzun 59; *ibid.*, 26.06.2001, A. Uzun 258, Euro-Sib.

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

Coşandere village, rocky places, 550 m, 19.06.2001, A. Uzun 202, endemic, LR (lc), Ir.-Tur.

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

Sumela monastery surroundings, open forest, 1500 m, 21.06.2001, A. Uzun 219, Eux.

Veronica persica Poir.

Coşandere village, open areas, 500 m, 09.06.2001, A. Uzun 166.

V. anagallis-aquatica L.

Sumela surroundings, wet places, streamsides, 1350 m, 26.06.2001, A. Uzun 259,

Cosm.

V. chamaedrys L.

Altındere village, forest, 750 m, 26.06.2001, A. Uzun 260, Euro-Sib.

V. peduncularis M.Bieb.

Coşandere village, *Picea* forest, 690 m, 27.05.2001, A. Uzun 105, Eux.

V. officinalis L.

Coşandere village, forest, 500 m, 12.07.2001, A. Uzun 309, Euro-Sib.

Euphrasia rostkoviana Hayne subsp. *rostkoviana*

Altındere village, wet places, open forest, 790 m, 27.05.2001, A. Uzun 106,

Euro-Sib.

E. pectinata Ten.

Altındere village, wet places, 880 m, 09.06.2001, A. Uzun 167, Euro-Sib.

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

Altındere village, open forest, 870 m, 31.05.2001, A. Uzun 135; Coşandere village, forest clearings, 550 m, 26.06.2001, A. Uzun 261; *ibid.*, 26.06.2001, A. Uzun 262; Sumela monastery surroundings, clearings, 1000 m, 12.07.2001, A. Uzun 310.

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

Coşandere village, open forest, 550 m, 31.05.2001, A. Uzun 136, Euro-Sib.

R. stricta (C.Koch) Albov

Sumela monastery surroundings, open forest, 1340 m, 12.07.2001, A. Uzun 311, Eux.

Lathraea squamaria L.

Sumela monastery surroundings, on *Picea* roots, 1340 m, 20.05.2001, A. Uzun 60,

Euro-Sib.

OROBANCHACEAE

Orobanche nana Noë ex Beck

Altındere village, on *Trifolium* sp., 850 m, 26.06.2001, A. Uzun 263; Coşandere village, forest clearings, 530 m, 26.06.2001, A. Uzun 264.

O. minor Sm.

Coşandere village, on *Trifolium* sp., 500-600 m, 19.06.2001, A. Uzun 203; *ibid.*, 26.06.2001, A. Uzun 265; *ibid.*, 31.05.2001, A. Uzun 137.

O. lutea Baumg.

Coşandere village, on *Trifolium* sp., 600 m, 20.03.2001, A. Uzun 10.

LAMIACEAE (Labiatae)

Ajuga reptans L.

Altındere village, slopes, 865 m, 19.06.2001, A. Uzun 198, Euro-Sib.

Teucrium polium L.

Coşandere village, stony slopes, 500-570 m, 31.05.2001, A. Uzun 132; *ibid.*, 02.08.2001, A. Uzun 346.

Phlomis russeliana (Sims) Benth.

Coşandere village, open forest, 590 m, 31.05.2001, A. Uzun 133, endemic, LR (lc), Eux. (mt.)

Lamium purpureum L. var. *purpureum*

Coşandere village, field banks, roadside, 630 m, 12.07.2001, A. Uzun 301, Euro-Sib.

L. maculatum L. var. *maculatum*

Altındere village, stony and shady places, 910 m, 27.05.2001, A. Uzun 104; Sumela monastery surroundings, under forest, 1220 m, 05.05.2002, A. Uzun 470, Euro-Sib.

L. ponticum Boiss. & Balansa ex Boiss.

Coşandere village, on rocks, 630 m, 12.07.2001, A. Uzun 302, endemic, LR (lc), Ir.-Tur.

- Leonurus marrubiastrum** L.
Sumela monastery surroundings, wet places, 1450 m, 21.08.2001, A. Uzun 400, Euro-Sib.
- Stachys byzantina** C.Koch
Coşandere village, roadsides, 525 m, 19.06.2001, A. Uzun 199, Euro-Sib.
- S. sylvatica** L.
Coşandere village, wet places, 565 m, 26.06.2001, A. Uzun 255; Altındere village, wet places, 850 m, 12.07.2001, A. Uzun 303, Euro-Sib.
- S. iberica** M.Bieb. subsp. *iberica* var. *iberica*
Coşandere village, stony slopes, 680 m, 12.07.2001, A. Uzun 304, Ir.-Tur.
- S. annua** (L.) L. subsp. *annua* var. *annua*
Coşandere village, forest, 630 m, 20.05.2001, A. Uzun 58.
- S. annua** (L.) L. subsp. *annua* var. *lycaonica* R.Bhattacharjee
Altındere village, forest, 800 m, 26.06.2001, A. Uzun 256, Ir.-Tur.
- S. macrantha** (C.Koch) Stearn
Sumela monastery surroundings, tree line, 1540 m, 13.07.2001, A. Uzun 334, Eux.
- Prunella vulgaris** L.
Coşandere village, grassy places, open forest, 538 m, 02.08.2001, A. Uzun 347, Euro-Sib.
- Origanum vulgare** L. subsp. *gracile* (C.Koch) Ietsw.
Sumela monastery surroundings, open forest, 1538 m, 02.08.2001, A. Uzun 348, Ir.-Tur.
- Calamintha sylvatica** Bromf. subsp. *sylvatica*
Coşandere village, open forest, 535 m, 02.08.2001, A. Uzun 349.
- C. nepeta** (L.) Savi subsp. *nepeta*
Altındere village, grassy places, 800 m, 18.08.2001, A. Uzun 381, Medit.
- C. nepeta** (L.) Savi subsp. *glondulosa* (Req.) P.W.Ball
Coşandere village, grassy places, 535 m, 02.08.2001, A. Uzun 350.
- Clinopodium vulgare** L. var. *vulgare*
Coşandere village, grassy places, 515 m, 02.08.2001, A. Uzun 351.
- Thymus praecox** Opiz subsp. *skorpilii* (Velen.) Jalas var. *skorpilii*
Coşandere village, wet places, 1400 m, 18.08.2001, A. Uzun 382
- T. longicaulis** C.Presl subsp. *longicaulis* var. *subisophyllus* (Borbás) Jalas
Coşandere village, wet places, 600 m, 07.09.2001, A. Uzun 436.
- Mentha pulegium** L.
Coşandere village, wet places, 500 m, 17.08.2001, A. Uzun 368.
- Salvia forskahlei** L.
Sumela monastery surroundings, *Picea* forest, 1040 m, 29.08.2001, A. Uzun 416, Eux.
- S. glutinosa** L.
Sumela monastery surroundings, *Picea* forest, 980 m, 12.07.2001, A. Uzun 305, Hyr.-Eux.
- S. virgata** Jacq.
Altındere village, *Picea* forest, 830 m, 12.07.2001, A. Uzun 306, Ir.-Tur.
- S. verticillata** L. subsp. *verticillata*
Coşandere village, open forest, 500-600 m, 12.07.2001, A. Uzun 307; *ibid.*, 02.08.2001, A. Uzun 352; Altındere village, forest, 800 m, 18.08.2001, A. Uzun 383, Euro-Sib.
- S. verticillata** L. subsp. *amasiaca* (Frey & Bornm.) Bornm.
Coşandere village, open forest, 500-550 m, 29.08.2001, A. Uzun 417; *ibid.*, 26.06.2001, A. Uzun 257, Ir.-Tur.
- PLANTAGINACEAE**
- Plantago lanceolata** L.
Sumela monastery surroundings, wet places, 1340 m, 12.07.2001, A. Uzun 308.
- THYMELAEACEAE**
- Daphne pontica** L.
Coşandere village, forest, 500 m, 27.05.2001, A. Uzun 90, Eux.
- SANTALACEAE**
- Thesium arvense** Horv.
Coşandere village, rocky places, 550 m, 26.06.2001, A. Uzun 240, Euro-Sib.
- LORANTHACEAE**
- Viscum album** L. subsp. *album*
Coşandere village, on *Pinus*, 550 m, 29.06.2001, A. Uzun 276.
- EUPHORBIACEAE**
- Mercurialis annua** L.
Altındere village, wet places, 750 m, 13.04.2001, A. Uzun 21.
- M. perennis** L.
Sumela monastery surroundings, *Picea* forest, 1040 m, 12.09.2001, A. Uzun 447, Euro-Sib.
- Euphorbia squamosa** Willd.
Coşandere village, field banks, 575-620 m, 20.05.2001, A. Uzun 48; *ibid.*, 19.06.2001, A. Uzun 194, Hyr.-Eux.
- E. falcata** L. subsp. *falcata* var. *falcata*
Coşandere village, field banks, open forest, 540 m, 02.08.2001, A. Uzun 343
- URTICACEAE**
- Urtica dioica** L.
Altındere village, open forest, roadsides, 850 m, 14.05.2002, A. Uzun 474; Sumela monastery surroundings, open forest, 1150 m, 14.05.2002, A. Uzun 475, Euro-Sib.
- Parietaria judaica** L.
Coşandere village, rock crevices, 500 m, 05.05.2002, A. Uzun 467.
- MORACEAE**
- Ficus carica** L. subsp. *carica*
Coşandere village, roadsides, 560 m, 26.05.2002, A. Uzun 487.
- ULMACEAE**
- Ulmus glabra** Huds.
Sumela monastery surroundings, mixed forest, 1100 m, 07.09.2001, A. Uzun 424, Euro-Sib.
- U. minor** Mill. subsp. *minor*
Sumela monastery surroundings, streamsides, mixed forest, 1150 m, 14.05.2002, A. Uzun 473.
- Celtis australis** L.
Coşandere village, roadsides, 510 m, 29.08.2001, A. Uzun 409, Medit.

JUGLANDACEAE

Juglans regia L.

Sumela monastery surroundings, streamsides, 1250 m, 07.09.2001, A. Uzun 425.

PLATANACEAE

Platanus orientalis L.

Sumela monastery surroundings, streamsides, 950 m, 26.05.2002, A. Uzun 486.

FAGACEAE

Fagus orientalis Lipsky

Sumela monastery surroundings, mixed forest, 1300 m, 18.08.2001, A. Uzun 374, Euro-Sib.

Castanea sativa Mill.

Sumela monastery surroundings, mixed forest, 1300 m, 09.06.2001, A. Uzun 147, Euro-Sib.

Quercus hartwissiana Steven

Coşandere village, mixed forest, 630 m, 21.08.2001, A. Uzun 393, Eux.

Q. petraea (Matt.) Liebl. subsp. *iberica* (Steven ex M.Bieb.) Krassiln.

Coşandere village, mixed forest, 680 m, 18.08.2001, A. Uzun 375.

CORYLACEAE

Carpinus betulus L.

Sumela monastery surroundings, mixed forest, 1000 m, 09.06.2001, A. Uzun 148; Sumela monastery surroundings, mixed forest, 1100 m, 29.08.2001, A. Uzun 410,

Euro-Sib.

C. orientalis Mill.

Altındere village, with *Quercus petraea* and *Juniperus oxycedrus*, 800 m, 12.07.2001, A. Uzun 277.

Ostrya carpinifolia Scop.

Sumela monastery surroundings, mixed forest, 950 m, 09.06.2001, A. Uzun 149, Medit.

Corylus avellana L. var. *avellana*

Coşandere village, open forest, 520 m, 07.09.2001, A. Uzun 426, Euro-Sib.

C. avellana L. var. *pontica* (C.Koch) Winkl.

Sumela monastery surroundings, under forest, 1030 m, 29.08.2001, A. Uzun 411, Eux.

BETULACEAE

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

Altındere village, streamsides, 900 m, 14.05.2002, A. Uzun 476, Eux.

SALICACEAE

Salix alba L.

Coşandere village, streamsides, 500 m, 14.05.2002, A. Uzun 478, Euro-Sib.

S. caprea L.

Sumela monastery surroundings, under forest, 1300 m, 20.05.2001, A. Uzun 38, Euro-Sib.

RUBIACEAE

Asperula taurina L. subsp. *caucasica* (Pobed.) Ehrend.

Coşandere village, forest, 630 m, 09.06.2001, A. Uzun 168; Sumela monastery surroundings, forest, 1220 m, 14.05.2002, A. Uzun 481, Hyr.-Eux.

A. involucrata Wahlenb.

Altındere village, forest, 790 m, 27.05.2001, A. Uzun 107; Coşandere village, forest, 630 m, 09.06.2001, A. Uzun 169, Eux.

Galium rotundifolium L.

Sumela monastery surroundings, under forest, 1220 m, 12.07.2001, A. Uzun 313; Altındere village, under forest, 865 m, 02.08.2001, A. Uzun 353, Euro-Sib.

G. odoratum (L.) Scop.

Sumela monastery surroundings, under forest, 1100 m, 09.06.2001, A. Uzun 170, Euro-Sib.

G. spurium L. subsp. *spurium*

Altındere village, grassy places, 965 m, 18.08.2001, A. Uzun 386, Euro-Sib.

Cruciata leavipes Opiz

Altındere village, rocky places, 745 m, 09.08.2001, A. Uzun 360, Euro-Sib.

MONOCOTYLEDONEAE

ARACEAE

Arum maculatum L.

Sumela monastery surroundings, forest, 960 m, 14.05.2002, A. Uzun 482; Coşandere village, forest, 590 m, 05.05.2001, A. Uzun 33.

LILIACEAE

Smilax excelsa L.

Coşandere village, scrub, 510 m, 27.05.2001, A. Uzun 114, Eux.

Ruscus aculeatus L. var. *angustifolius* Boiss

Coşandere village, shady places, 650 m, 20.05.2001, A. Uzun 67.

Polygonatum multiflorum (L.) All.

Sumela monastery surroundings, shady places, 1050-1100 m, 27.05.2001, A. Uzun 113; *ibid.*, 19.06.2001, A. Uzun 213.

Allium rupestre Steven

Sumela monastery surroundings, *Picea* forest, 1250-1550 m, 28.08.2001, A. Uzun 408; *ibid.*, 20.09.2001, A. Uzun 454, Eux.

Scilla winogradowii Sosn.

Sumela monastery surroundings, stony places, 1050 m, 13.04.2001, A. Uzun 28, Eux.

S. monanthos C.Koch

Sumela monastery surroundings, stony places in *Picea* forest, 1340 m, 13.04.2001, A. Uzun 29, Eux.

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

Sumela monastery surroundings, shady places in *Picea* forest, 1100 m, 13.04.2001, A. Uzun 30, Ir.-Tur.

Muscari armeniacum Leichtlin ex Baker

Coşandere village, roadsides, 520 m, 20.05.2001, A. Uzun 68.

M. neglectum Guss.

Coşandere village, stony places, 625 m, 20.05.2001, A. Uzun 69.

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

Coşandere village, forest, 630 m, 20.05.2001, A. Uzun 70, rare, VU, Eux.

Colchicum speciosum Steven

Sumela monastery surroundings, open forest, 1235 m, 07.09.2001, A. Uzun 441, Hyr.-Eux.

AMARYLLIDACEAE**Galanthus rizehensis** Stern

Coşandere village, shady places, 550 m, 31.01.2001, A. Uzun 1; Altındere village, rocky places, 750 m, 17.02.2001, A. Uzun 3; Sumela monastery surroundings, rocky places, 1200 m, 11.03.2001, A. Uzun 5,

rare, VU, Eux.

G. woronowii Losinsk.

Coşandere village, shady places, 1150 m, 10.03.2002, A. Uzun 461.

IRIDACEAE**Crocus vallicola** Herb.

Sumela monastery surroundings, shady places, 1300 m, 07.09.2001, A. Uzun 442, Eux.

ORCHIDACEAE**Listera ovata** (L.) R.Br.

Sumela monastery surroundings, Picea forest, 1300 m, 14.05.2002, A. Uzun 484, Euro-Sib.

Cephalanthera longifolia (L.) Fritsch

Coşandere village, shady places, 680 m, 20.05.2001, A. Uzun 71, Euro-Sib.

Orchis tridentata Scop.

Coşandere village, open forest, 500-560 m, 19.06.2001, A. Uzun 215; *ibid.*, 27.06.2001, A. Uzun 274; Altındere village, roadsides, 800 m, 27.06.2001, A. Uzun 275, *Medit.*

O. purpurea Huds.

Coşandere village, grassy slopes, 625 m, 20.05.2001, A. Uzun 72, Euro-Sib.

O. simia Lam.

Coşandere village, forest, 670 m, 13.04.2001, A. Uzun 31, *Medit.*

O. palustris Jacq.

Coşandere village, wet places, 540 m, 31.05.2001, A. Uzun 141.

Dactylorhiza saccifera (Brongn.) Soó

Coşandere village, streamsides, 530 m, 12.07.2001, A. Uzun 330, *Medit.*

D. urvilleana (Steud.) Baumann & Künkele

Sumela monastery surroundings, wet and grassy slopes, open forest, 1050-1470 m, 08.06.2001, A. Uzun 142; *ibid.*, 19.06.2001, A. Uzun 216; *ibid.*, 12.07.2001, A. Uzun 331, Eux.

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

Sumela monastery surroundings, grassy slopes, 1470 m, 08.06.2001, A. Uzun 143, Eux.

DIOSCOREACEAE**Tamus communis** L. subsp. *communis*

Coşandere village, in forest, 500-630 m, 27.05.2001, A. Uzun 115; *ibid.*, 19.06.2001, A. Uzun 214; *ibid.*, 02.08.2001, A. Uzun 357

JUNCACEAE**Juncus effusus** L.

Sumela monastery surroundings, wet places, 960 m, 14.05.2002, A. Uzun 483, *Cosm.*

Luzula forsteri (Sm.) DC.

Sumela monastery surroundings, forest clearings, 1040 m, 05.05.2002, A. Uzun 472.

CYPERACEAE**Carex sylvatica** Huds. subsp. *sylvatica*

Sumela monastery surroundings, forest, 1340 m, 12.07.2001, A. Uzun 322, Euro-Sib.

POACEAE (Gramineae)**Brachypodium sylvaticum** (Hudson) P.Beauv.

Sumela monastery surroundings, forest, 1000 m, 17.08.2001, A. Uzun 372;

Coşandere village, forest clearings, 500 m, 26.06.2001, A. Uzun 273, Euro-Sib.

B. pinnatum (L.) P.Beauv.

Sumela monastery surroundings, edge of forest, 1500 m, 07.09.2001, A. Uzun 440; *ibid.*, 12.09.2001, A. Uzun 453, Euro-Sib.

Bromus racemosus L.

Sumela monastery surroundings, wet slopes, 900 m, 12.07.2001, A. Uzun 323, Euro-Sib.

Holcus lanatus L.

Altındere village, wet and grassy slope, 850 m, 12.07.2001, A. Uzun 324, Euro-Sib.

Calamagrostis arundinacea (L.) Roth

Sumela monastery surroundings, forest, 1300 m, 18.08.2001, A. Uzun 392, Euro-Sib.

Festuca drymeja Mert. & Koch

Sumela monastery surroundings, open forest, 1230 m, 12.07.2001, A. Uzun 325, Euro-Sib.

Lolium perenne L.

Sumela monastery surroundings, open forest, 900 m, 12.07.2001, A. Uzun 326, Euro-Sib.

Poa nemoralis L.

Sumela monastery surroundings, grassy slopes, 1340 m, 12.07.2001, A. Uzun 327.

Dactylis glomerata L. subsp. *glomerata*

Coşandere village, grassy slopes, 500 m, 19.06.2001, A. Uzun 212; Altındere village, clearings, 850 m, 12.07.2001, A. Uzun 328; Sumela monastery surroundings, grassy clearings, 950 m, 12.07.2001, A. Uzun 329, Euro-Sib.

Melica uniflora Retz.

Sumela monastery surroundings, forest, 1050 m, 26.05.2002, A. Uzun 488, Euro-Sib.