

Vascular Plant Diversity of Esenli (Giresun) Forest Planning Unit

Mustafa Karaköse 

Giresun University, Espiye Vocational School, Giresun, Turkey

Abstract

This study was undertaken to assess the floristic composition of the Esenli (Giresun) Forest Planning Unit. In the said planning unit, plant taxa were gathered from numerous stations at different vegetation periods between 2015 and 2019. The study area is located between 825 and 2250 m in the Colchic sector of the Euxine province within the Euro-Siberian floristic region. With this study, 486 vascular plant taxa belonging to 87 families and 395 genera were found in Pteridophyta and Magnoliophyta sections. The Pteridophyta section was represented by 16 taxa and the Magnoliophyta section (including gymnosperms and angiosperms) by 470 taxa. The largest family was Asteraceae (68 taxa; 13.9%), followed by Fabaceae (32; 6.6%), Lamiaceae (31; 6.4%), Rosaceae (30; 6.2%), and Brassicaceae (23; 4.7%). The predominance of plant taxa belonging to the Euro-Siberian phytogeographical region in the study area is noteworthy. Additionally, Irano-Turanian (25 taxa: 5.1%) and Mediterranean (13 taxa: 2.7%) plants were observed. According to the Raunkiaer plant-life form system, hemicryptophytes with 274 plant taxa (56.4%), geophytes with 67 taxa, and therophytes with 66 taxa were the most common life forms. With this study, 109 vascular plant taxa were newly recorded in the Giresun Province. In the study area, 30 plant taxa are endemic to Turkey, and the ratio of endemism is 6.2%.

Keywords: Colchic, euro-siberian, euxine, plant biodiversity, Turkey

Introduction

Turkey, due to its diverse nature, geographical, topographical, and microclimate conditions, and its location at the junction of three different floristic regions (Euro-Siberian, Mediterranean, and Irano-Turanian), is one of the most important gene centers in the world in terms of plant biodiversity (Terzioğlu et al., 2012). Turkey has a biodiversity that is more diverse than many other neighboring countries. For these reasons, Turkey has, from past to present, attracted the attention of many local and foreign botanists. De Tournefort (1717) is the leading researcher in this field. After that, one remarkable study related to Turkey is *Flora Orientalis*, which was published by a botanist (Boissier, 1867–1888). Also, until 1975, many botanists made numerous technical trips (Yıldırımli, 2014) to Turkey.

One hundred years after *Flora Orientalis*, *Flora of Turkey and the East Aegean Islands* was published in nine volumes and along with a supplementary volume, it was edited by the British botanist P H Davis (Davis, 1965–1985; Davis et al., 1988). The second supplementary volume of this work (Güner et al., 2000) was completed under the editorship of Turkish botanists. Since these studies, Turkish botanists have carried out many floristic studies in many regions until today. With the APG system (Stevens, 2001), the current flora was insufficient for researchers. Therefore, Turkish botanists decided to take the first step to write a new illustrated flora, and Güner et al. (2012) published Turkey Plant List (Vascular Plants) as a checklist including all of the plant taxa in Turkey according to the APG system. According to this checklist, the Flora of Turkey is represented by 11 707 taxa at the species and subspecies level, of which 11 466 are natural, 171 are foreign, and 70 are agricultural

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Corresponding Author:

Mustafa Karaköse

e-mail:

mustafa.karakose@giresun.edu.tr

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plants. Besides, 3649 of these plant taxa are endemic to Turkey, and the rate of endemism in our country is 31.8%. Moreover, these values have increased with the studies conducted in recent years. These studies have revealed that of the 374 000 (Christenhusz & Byng, 2016) plant species registered in the world, 12 975 plant taxa are found within the borders of Turkey. The number of endemic plant taxa is now known to be 4157 (Özhatay et al., 2013, 2015, 2017, 2019), and the endemism rate has been updated as 32%. These values, indeed, will continue to rise (Karaköse, 2020) with each new study.

Eastern Blacksea forest ecosystems have been well-studied in Trabzon, Rize, and Artvin provinces. However, only four studies (Hüseyinoğlu et al., 2017; Karaköse et al., 2018a; Şenel et al., 2014; Tuğ & Ketenoğlu 2004) were conducted in the Giresun Province. The floristic structure of forest ecosystems belonging to the Giresun Province, which is of great importance due to its location within the Caucasus Biodiversity Hotspot, is not well-known. These forest ecosystems are globally recognized as the Euxine-Colchic broadleaf forests and the Caucasus mixed forests, which are also briefly known as the Caucasus-Anatolian-Hyrcanian Temperate Forests, classified as one of the 200 Global Ecoregions (WWF and IUCN, 1994). Taking these as a starting point, this study aimed to explain some distribution patterns in the floristic structure of the forests of Giresun Province and to contribute to the new Turkish Flora, which is currently under preparation. Furthermore, this study is expected to assist decision-makers in conservation biology in forest ecosystem management.

Methods

Study Area

The Esenli Forest Planning Unit (FPU) is located within the Giresun Regional Directorate of Forestry. Based on the planning unit, Esenli FPU is bounded by four planning units (Yağlıdere, Ekindere, Tohumluk, & Karadoğa) of the Giresun Regional Directorate of Forestry. The study area is geomorphologically mountainous and steep, and the average height from the sea level is 1600 m. The study area that lies between 825 and 2250 m is located in the Colchic sector of Euxine province of the Euro-Siberian floristic area and lies between 40°28'12" and 40°38'26" north latitudes and between 38°30'30" and 38°41'07" east longitudes (Figure 1). Of a total area of 12 573.4 ha, 6350.1 ha is covered by forested areas. Climate assessments of the study area were done according to the observations made between 1964 and 2016 at Sebinkarahisar meteorological station. The annual average temperature in the region is 7.7°C, while the average annual precipitation is 689.1 mm in Esenli. Moreover, the study area is under the influence of the oceanic climate (Karaköse & Karaköse, 2017). Within the planning unit, there are four settlements: Akpınar, Güllüce, Çakrak, and Derindere.

In the study area, five main forest trees characterize the forest vegetation. There are pure or mixed forests of *Pinus sylvestris* L. var. *hamata* Steven, *Fagus orientalis* Lipsky, *Picea orientalis*

(L.) Peterm., *Carpinus betulus* L., and *Alnus glutinosa* (L.) Gaertn. subsp. *barbata* (C. A. Mey.) Yalt. (Figure 1). The hornbeam-dominated forest is commonly found in the northern part of the Esenli region at lower altitudes. Oriental Beech forests are located mainly in Derindere and Güllüce villages, and Scotch Pine forests are located in Çakrak and Akpınar villages between 1500 and 2200 m. Oriental spruce forests are spread in middle altitudes of Esenli in Güllüce and Akpınar villages (Karaköse, 2019).

Plant Materials and Identification

The material of the study comprises vascular plant samples gathered from field studies carried out between 2015 and 2019. Plant samples were collected from the study area within the vegetation period in accordance with the plant collection rules. The location of the plant specimens collected during the surveys, the characteristics of the habitat, altitudes, and collection dates were recorded. These plants were identified using the Flora of Turkey and the East Aegean Islands (Davis, 1965–1985; Davis et al., 1988; Güner et al., 2000). Scientific names of plant taxa were checked using the Turkish Plant List (Güner et al., 2012) and updated according to World Flora Online (WFO, 2021). The phytogeographical regions of the taxa were evaluated according to Güner et al. (2012). The life forms of plant taxa were evaluated according to Raunkiaer's system (1934). A comparison with previous studies in terms of the floristic composition was made by using the Sørensen (1948) similarity index. Sorensen's (Dice) similarity index was calculated using the PAST (version 3.26) program (Hammer et al., 2001). In addition, IUCN threat categories of endemic plants were added to the list according to the Red Data Book of Turkish Plants (Ekim et al., 2000) and The Red List of Endemic Plants of The Caucasus (Ekim et al., 2014). Upper taxonomic units of plant taxa were prepared according to Christenhusz et al. (2011a, b) and Pteridosperm Phylogeny Group I (PPG I, 2016) for Pteridophyta; Christenhusz et al. (2011a, b) for Gymnospermae sub-division; and Angiosperm Phylogeny Group (APG) IV (Chase et al., 2016) for Angiospermae sub-division.

Results

After the identification of plant specimens, 486 (including 4 hybrids) vascular plant taxa belonging to 87 families and 395 genera were found in Pteridophyta and Magnoliophyta (Pinidae and Magnoliidae subclasses) sections (Appendix). Among the identified taxa, herbs are represented by 419 taxa, trees by 40 taxa, shrubs by 20 taxa, and climbers by 7 (including 4 woody) taxa.

The Pteridophyta section (Equisetidae and Polypodiidae subclasses) is represented by 16 (3.3%) taxa. The gymnosperms (orders of Pinales and Cupressales within the Pinidae subclass) are represented by 3 families, 5 genera, and 5 woody taxa (1%). The Magnoliidae subclass is represented by 465 (95.7%) species and subspecies. Angiosperms belong to monocotyledonous with 51 (11%) vascular plant taxa, followed by

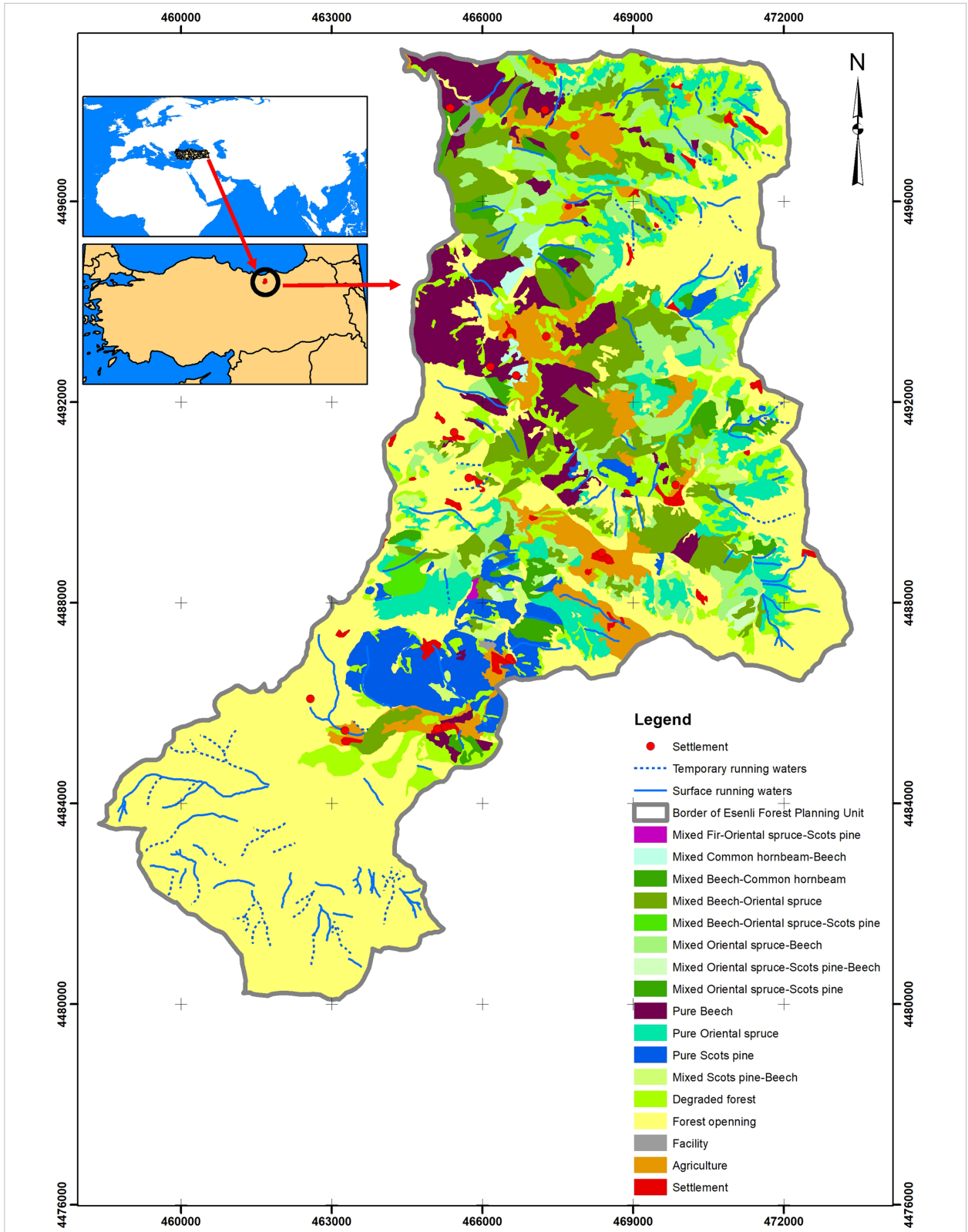


Figure 1.
Location of the Study Area

dicotyledonous with 414 (89%) taxa. Dicotyledonous plants are represented by Magnolids (1 family, 1 genus, and 1 taxon), Eudicots (4 families, 12 genera, and 1 taxon), Super-rosids (3 families, 5 genera, and 17 taxa), Rosids (25 families, 80 genera, and 146 taxa), Super-asterids (5 families, 16 genera, and 25 taxa), and Asterids (21 families, 124 genera, and 215 taxa).

The richest families are Asteraceae (45 genera/68 taxa), Fabaceae (13/32), Lamiaceae (15/31), Rosaceae (18/30), Brassicaceae (17/23), Apiaceae (16/19), and Poaceae (15/17) (Table 1). The richest genera according to the number of plant taxa are *Veronica* 11 (2.3%), *Campanula* 8 (1.6%), *Trifolium* 8 (1.6%), *Geranium* 8 (1.4%), *Silene* 8 (1.4%), *Cardamine* 8 (1.2%), *Cirsium* 8 (1.2%), *Epilobium* 8 (1.2%), *Galium* 8 (1.2%), and *Lamium* 8 (1.2%). The phytogeographical region of 295 (60.7%) taxa in the Esenli FPU was determined (Table 1).

With this study, 109 vascular plant taxa were newly recorded in the Giresun Province. In the appendix (floristic list of the Esenli FPU), an asterisk "*" in front of plant taxa indicates a new record for the Giresun Province. In the study area, 30 plant taxa are endemic to Turkey, and the ratio of endemism is 6.2% (Table 2). Regarding the conservation status, 456 (93.8%) taxa are not in IUCN categories, 4 (0.8%) in the category of endangered, 3 (0.6%)

vulnerable, 4 (0.8%) near threatened, and 19 (3.9%) least concern (Table 2).

The plant taxa classification in terms of phytogeographical regions was as follows: Euro-Siberian 123 (25.3%), Euxine 78 (16%), Irano-Turanian 25 (5.1%), Hyrcano-Euxine 17 (3.5%), Euxine (mt) 10 (2.1%), Mediterranean 10 (2.1%), and East Mediterranean 3 (0.6%). The remaining 220 taxa (45.3%) were cosmopolitan and multiregional (Figure 2).

Hemicyptophytes 274 (56.4%) is the dominant life form in the Esenli FPU (Figure 3). The distribution of other plant taxa with respect to life forms is as follows: geophytes (cryptophytes) 67 (13.8%), therophytes 66 (13.6%), phanerophytes 64 (13.2%), chamaephytes 12 (2.5%), and vascular parasite 3 (0.6%).

Discussion, Conclusion and Recommendations

According to Zohary (1973), the Euxine province is divided into three subareas as eu-Euxine, sub-Euxine, and xero-Euxine due to the differences in the floristic structure caused by the climatic change in the horizontal direction. Of these, the eu-Euxine belt is the most humid part of the area. In the Euxine province, there is usually no significant summer drought due

Table 1.
 Most Represented Families (with ≥ 6 Taxa) and Genera (with ≥ 5 Taxa) in the Esenli FPU

Family	Number of Taxa	Rate (%)	Genera	Number of Taxa	Rate (%)
Asteraceae	68	14.1	<i>Veronica</i>	11	2.3
Fabaceae	32	6.6	<i>Campanula</i>	8	1.6
Lamiaceae	31	6.4	<i>Trifolium</i>	8	1.6
Rosaceae	30	6.2	<i>Geranium</i>	7	1.4
Brassicaceae	23	4.8	<i>Silene</i>	7	1.4
Apiaceae	19	3.9	<i>Cardamine</i>	6	1.2
Poaceae	17	3.5	<i>Cirsium</i>	6	1.2
Caryophyllaceae	16	3.3	<i>Epilobium</i>	6	1.2
Plantaginaceae	15	3.1	<i>Galium</i>	6	1.2
Ranunculaceae	12	2.5	<i>Lamium</i>	6	1.2
Boraginaceae	11	2.3	<i>Hypericum</i>	5	1.0
Orchidaceae	10	2.1	<i>Lathyrus</i>	5	1.0
Rubiaceae	10	2.1	<i>Ranunculus</i>	5	1.0
Campanulaceae	9	1.9	<i>Scrophularia</i>	5	1.0
Geraniaceae	9	1.9	Others	395	81.3
Onagraceae	8	1.7			
Orobanchaceae	8	1.7			
Scrophulariaceae	8	1.7			
Ericaceae	6	1.2			
Primulaceae	6	1.2			
Salicaceae	6	1.2			
Others	132	27.3			

Table 2.
Endemic Plant Taxa of the Esenli FPU

No	Taxon Name	Phytogeographical Region	IUCN Categories
1	<i>Allium olympicum</i> Boiss.	Eur-Sib	LC
2	<i>Angelica sylvestris</i> L. var. <i>stenoptera</i> Avé-Lall.	Eur-Sib	EN
3	<i>Astragalus amoenus</i> Fenzl	Ir-Tur	LC
4	<i>Campanula grandis</i> Fisch. & C.A.Mey. subsp. <i>grandis</i> Fisch. & C.A.Mey.	Unknown	LC
5	<i>Centaurea helenioides</i> Boiss.	Unknown	NT
6	<i>Cirsium pseudopersonata</i> Boiss. & Balansa ex Boiss. subsp. <i>pseudopersonata</i>	Eur-Sib	LC
7	<i>Cirsium trachylepis</i> Boiss.	Eur-Sib	VU
8	<i>Crepis bupleurifolia</i> (Boiss.) Freyn & Sint. ex Freyn & Sint.	Ir-Tur	LC
9	<i>Crocus aerius</i> Herb.	Eur-Sib	VU
10	<i>Cyclamen parviflorum</i> Pobed.	Unknown	LC
11	<i>Dianthus carmelitarum</i> Reut. ex Boiss.	Eur-Sib	LC
12	<i>Digitalis lamarckii</i> Ivanina	Ir-Tur	LC
13	<i>Galium fissurense</i> Ehrend. & Schön.-Tem.	Eur-Sib	LC
14	<i>Geranium sintensisii</i> Freyn	Eur-Sib	LC
15	<i>Helichrysum arenarium</i> (L.) Moench subsp. <i>erzincanicum</i> P.H.Davis & Kupicha	Ir-Tur	VU
16	<i>Hieracium pannosum</i> Boiss. subsp. <i>bornmuelleri</i> (Freyn) Murr & Zahn	Unknown	LC
17	<i>Lathyrus czeczottianus</i> Bässler	Eur-Sib	LC
18	<i>Lathyrus tukhtensis</i> Czezzott	Eur-Sib	LC
19	<i>Lilium ciliatum</i> P.H.Davis	Unknown	NT
20	<i>Linum unguiculatum</i> P.H.Davis	Ir-Tur	LC
21	<i>Lonicera orientalis</i> Lam.	Unknown	LC
22	<i>Melampyrum elatius</i> Reut. ex Boiss.	Eur-Sib	NT
23	<i>Myosotis lazica</i> Popov	Eur-Sib	NT
24	<i>Papaver triniifolium</i> Boiss.	Ir-Tur	LC
25	<i>Pastinaca armena</i> Fisch. & C.A.Mey.	Unknown	VU
26	<i>Scaligeria lazica</i> Boiss.	Eur-Sib	NT
27	<i>Silene lazica</i> Boiss.	Eur-Sib	LC
28	<i>Symphytum sylvaticum</i> Boiss.	Eur-Sib	EN
29	<i>Trifolium elongatum</i> Willd.	Unknown	LC
30	<i>Verbascum armenum</i> Boiss. & Kotschy ex Boiss. var. <i>tempkyanum</i> (Freyn & Sint.) Murb.	Ir-Tur	LC

to rainfall during the summer months. Annual rainfall exceeds 1000 mm in some regions (Akman, 2011). Due to the climate change in the north-south direction, the intergenerational boundaries are roughly determined (Zohary, 1973). The Euxine province consists mainly of mesophytic deciduous broadleaf forests and coniferous forests (Browicz, 1989). These forests are globally known as the Euxine-Colchic broadleaf forests and the Caucasus mixed forests, which are also briefly known as the Caucasus-Anatolian-Hyrcanian temperate forests, classified as one of the 200 global ecoregions (Akbulut & Kurdoğlu, 2015; WWF & IUCN, 1994).

The study area is located in the eastern part of the Euxine province of the Euro-Siberian phytogeographical region. This region is also known as the Colchic sector (Davis, 1965–1985). Therefore, it is expected that approximately half of the taxa (228 plant taxa) in the study area are from the Euro-Siberian phytogeographical region. There are also some plant taxa characteristic of and inherited from the Tertiary age (Browicz, 1989) such as *P. orientalis* (L.) Peterm., *Abies nordmanniana* (Steven) Spach subsp. *nordmanniana*, *Ilex colchica* Pojark., *Hedera colchica* (K. Koch) K. Koch, *Daphne glomerata* Lam. for the Colchic sector in this area. On the other hand, there are some transitional zones

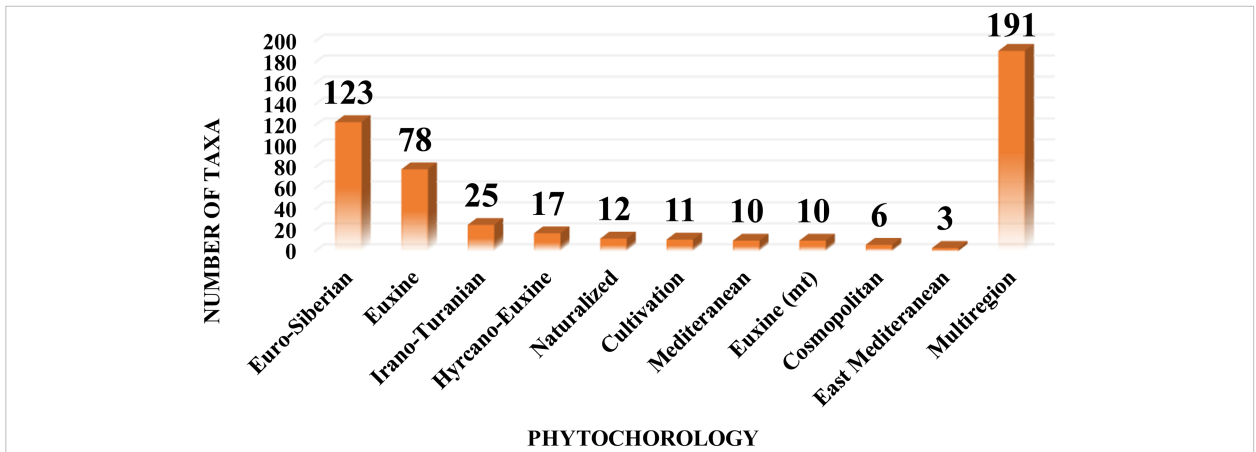


Figure 2.
 The Distribution of Plant Taxa in the Study Area According to Phytogeographical Regions.

between the Euro-Siberian and Irano-Turanian phytogeographical regions within the study area (Davis, 1965–1985). Because of this situation, the plant taxa belonging to the Irano-Turanian phytogeographical region rank second in the study area. The study area also has some taxa of Mediterranean origin, which are relicts of the old Mediterranean (Tethys flora) region (Davis, 1965–1985). Similar results (Table 3) were observed by previous studies (except for Tuğ and Ketenoğlu (2004)), which have been done in the region closest to the area (Hüseyinoğlu et al., 2017; Şenel et al., 2014; Uzun & Anşın 2006; Uzun & Terzioğlu 2008). This is because all the studies, except for the one conducted by Tuğ and Ketenoğlu (2004), were undertaken in the Euro-Siberian phytogeographical region, just like this study. However, the area selected by Tuğ and Ketenoğlu (2004) is located in the mainly mountainous Euxine (xero-Euxine zone) and also supra-Mediterranean pre-pontic belts, and therefore, the plants of the Irano-Turanian phytogeographical region were more dominant in the said study.

In the study area, the most common life form was hemicryptophytes with the highest number of plant taxa, followed by geophytes, therophytes, and phanerophytes. As Hüseyinoğlu et al. (2017) stated, the dominance of the hemicryptophytes shows the presence of a cold, humid, and semi-humid climate, while phanerophytes reflect the impact of the Mediterranean climate. The high amount of these taxa in the Esenli FPU is a general characteristic of temperate forests. On the other hand, plant taxa with geophytes rank second in the study area. The reason for this is the oceanic climate, which has an effect on the Esenli FPU and is an indicator of a high annual precipitation amount. Within the planning unit, there are *P. sylvestris* forests at an altitude of higher than 1700 m and subalpine and alpine meadows at even higher altitudes. For this reason, large amounts of therophyte plants were collected within the scope of the study. The high amount of therophytes is a reflection of overgrazing in addition to the arid climate (Archibold, 1995). This ranking is compatible with the life form spectrum that

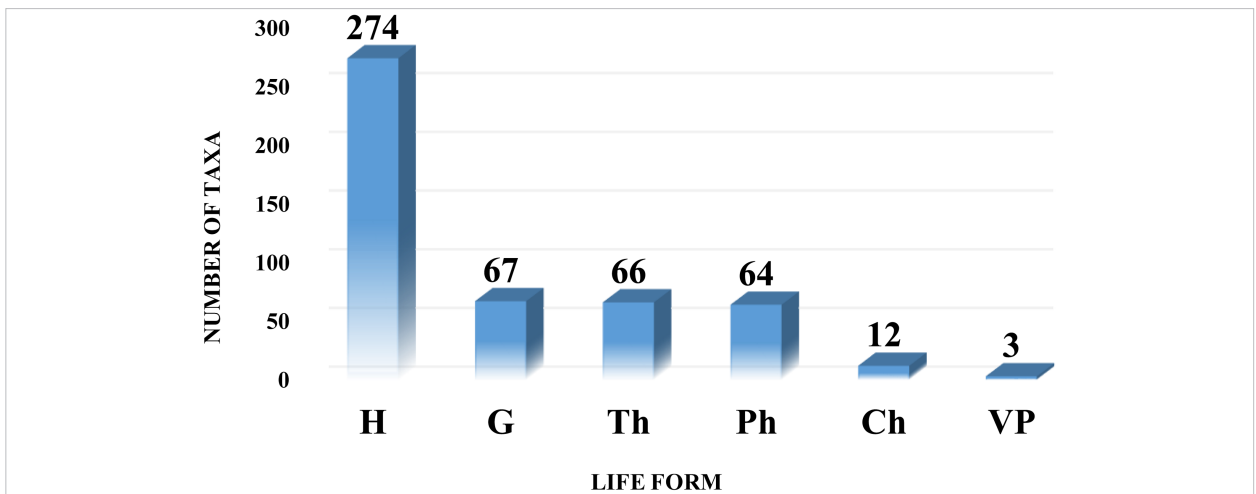


Figure 3.
 The Distribution of Plant Taxa in the Study Area According to Life Forms.

Table 3.
Comparison of Plant Taxa in Terms of Phytogeographic Region and Endemism

Phytogeographic Region and Endemism	This Study		Hüseyinoğlu et al., 2017		Şenel et al., 2014		Tuğ and Ketenoğlu, 2004		Uzun and Terzioğlu, 2008		Uzun and Anşin, 2006	
	No	(%)	No	(%)	No	(%)	No	(%)	No	(%)	No	(%)
Euro-Siberian	228	46.9	75	32.6	103	36.9	42	10.1	184	48	193	50.3
Irano-Turanian	25	5.1	42	18.3	6	7.9	107	25.8	14	3.7	23	6
Mediterranean	13	2.7	8	3.5	3	3.5	13	3.1	11	2.9	4	1
Endemic	30	6.2	28	12.2	31	6.4	54	13	16	4.2	32	8.3
Total	486		230		482		415		383		385	

Raunkiaer (1934) established for temperate deciduous broad-leaf-coniferous forests. This situation is directly related to the location of the study area (Karaköse, 2019). Although the study area is mostly within sub-Euxine, it is partially located in eu-Euxine (Zohary, 1973). Thus, according to Quézel et al. (1980), the Esenli FPU is found within the pre-pontic mountain and supra-Mediterranean pre-pontic belts but is also partially affected by the mountainous Euxine belt. As a result, a hemicytrophitic climate prevails in the study area.

The data obtained within the scope of the study were compared with other studies previously conducted in Giresun Province. According to the Sorensen similarity ratios, the floristic composition of the Esenli FPU is 10.9, 51.3, and 17.4%, which are similar to the neighboring regions of Tuğ and Ketenoğlu (2004), Şenel et al. (2014), and Hüseyinoğlu et al. (2017), respectively. Since Şenel et al.'s (2014) study area was close to Esenli, a close similarity ratio with their study occurred. However, similarity ratios with other studies conducted in Giresun Province were found to be low because they were far from the Esenli FPU. This comparison was also made with the flora of Turkey,

and the similarity ratio was found as 46.1%. It has been indicated that the largest five families in the flora of Turkey are Asteraceae, Fabaceae, Lamiaceae, Brassicaceae, and Poaceae (Davis, 1965–1985; Davis et al., 1988; Güner et al., 2000). The family ranking obtained from this study is consistent with the flora of Turkey. The first ten major families in the study area constitute 54.1% of the total number of plant taxa (Table 4). When Esenli and other studies are examined in terms of family scale, the Asteraceae family is in the first place in all studies. This result can be attributed to their wide ecological tolerance, family members having cosmopolitan character, and also to their influential seed spread capability. However, when the data of this study are compared with the data reported by Tuğ and Ketenoğlu (2004), it is seen that the family ranking is not compatible (Table 4). As a matter of fact, when the relevant study (Tuğ & Ketenoğlu 2004) is examined, the presence of xerophytic plants belonging to the Caryophyllaceae and Scrophulariaceae families increases in the xero-Euxine zone. This result also shows itself clearly in terms of the phytogeographical region (Table 3). In other studies, thermophilous and mesophylous plant taxa were shown to be more advantageous to distribute

Table 4.
Comparison of the Families Containing the Most Taxa in Previous Close Studies

Families	This Study		Hüseyinoğlu et al., 2017		Şenel et al., 2014		Tuğ and Ketenoğlu, 2004		Uzun and Terzioğlu, 2008		Uzun and Anşin, 2006	
	No	(%)	No	(%)	No	(%)	No	(%)	No	(%)	No	(%)
Asteraceae	68	14.1	39	17	70	14.5	67	16.5	35	9.1	39	10
Fabaceae	32	6.6	18	7.8	39	8.1	34	8	23	6	23	6
Lamiaceae	31	6.4	11	4.8	32	6.6	32	7.8	27	7	12	3
Rosaceae	30	6.2	10	4.4	19	4	12	2.8	22	5.7	35	9
Brassicaceae	23	4.8	14	6.1	26	5.4	12	3.1	18	4.7	9	2.3
Apiaceae	19	3.9	3	1.3	13	2.7	11	2.7	17	4.4	9	2.3
Poaceae	17	3.5	28	12.2	24	5	23	5.4	10	2.6	29	8
Caryophyllaceae	16	3.3	12	5.2	21	4.4	32	7.8	9	2.3	15	3.9
Plantaginaceae	15	3.1	8	3.5	13	2.7	1	0.2	1	0.3	2	0.5
Ranunculaceae	12	2.5	8	3.5	9	1.9	9	2.2	10	2.6	14	4
Total	486		230		482		415		383		385	

because they are in the Euro-Siberian phytogeographical region. In addition to these, there are minor family-based discrepancies with the literature. As known, the changing process that started with Stevens (2001) in the angiosperms also shows itself in the new flora of Turkey (Güner et al., 2012). With recent studies (Chase et al., 2016), genera and species belonging to families such as Scrophulariaceae and Liliaceae are transferred into different families (i.e., Plantaginaceae, Orobanchaceae, Colchicaceae, and Asparagaceae). In previous studies, except for Şenel et al. (2014) and Hüseyinoğlu et al. (2017), the APG system was not followed. Therefore, changes in family rankings have also been observed with these studies.

In Turkey, the richest region in terms of endemism is the Irano-Turanian phytogeographical region, which is followed by the Mediterranean and Euro-Siberian phytogeographical regions, respectively (Ekim et al., 2000). With this study, 30 endemic plant taxa (of which 15 belong to Euro-Siberian, 7 to Irano-Turanian, and 8 to unknown regions) were gathered, and the endemism rate was found to be 6.2%. Since the study area is located in the Euro-Siberian phytogeographical region and covers mainly forest vegetation, the rate of endemism is quite low compared to the flora of Turkey (32%). Accordingly, the comparison of endemism rates obtained from study areas is given in Table 3. The study area of Tuğ and Ketenöğlü (2004) is under the dominance of the Irano-Turanian phytogeographical region, as mentioned subsequently. Therefore, this study ranks first in terms of endemism, which is in accordance with the flora of Turkey. Similarly, the floristic study carried out by Uzun and Anşın (2006) in the subalpine and alpine areas ranked second due to the influence of the Irano-Turanian phytogeographical region. As can be seen from the related table, the Esenli FPU ranks fourth in terms of endemism. The reason for this is that the effect of the Euro-Siberian phytogeographical region is higher than that of Irano-Turanian in the Esenli FPU. Agriculture and animal husbandry do not provide local people with a sufficient livelihood. Livestock is not developed enough to trade. Hence, forestry is another source of livelihood for local people. As accepted by all sectors, forestry and animal husbandry activities are harmful to the local flora in some way. Because of forestry activities, logging causes considerable damage to the forest soil and flora. In animal husbandry, feeds obtained from the cutting of meadow grasses in pasture areas are generally used. Therefore, livestock, forestry, and incorrect land use pose a risk for endemic plants that are naturally distributed in the region. Thus, the status of endemic plants (*Cirsium trachylepis* (NT), *Lilium ciliatum* (NT), and *Crocus aureus* (VU)), which were previously in the lower threat category, was updated into the threat category after Ekim et al. (2014) (see Appendix).

The Esenli FPU is home to many useful plants. There are four settlements (Derindere, Güllüce, Akpınar, and Çakrak vil-lages) within the planning unit. Local people earn their livelihood from agriculture and livestock. Plant taxa such as *Brassica oleracea* L., *Cerasus avium* (L.) Moench, *Corylus avellana* L. var. *avellana*, *Corylus maxima* Mill., *Juglans regia* L., *Malus sylvestris* (L.) Mill. subsp. *sylvestris*, *Morus alba* L., *Prunus domestica* L., *Pyrus*

elaeagnifolia Pall. subsp. *kotschyana* (Boiss.) Browicz, *Rosa canina* L., and *Zea mays* L. are most commonly cultivated. In their study, Karaköse and Karaköse (2017) identified 110 medicinal and aromatic plants in the study area. These plant taxa have been used mainly for the digestive system, respiratory system, and skin disorders. Resin from *P. orientalis* treats stomach pain, while *P. sylvestris* L. var. *hamata* Steven is mostly used for influenza, colds, and shortness of breath. Other important medicinal plants include plant taxa such as *Vaccinium arctostaphylos* L., *Vaccinium myrtillus* L., *Sambucus ebulus* L., *Hypericum perforatum* L. subsp. *veronense* (Schrank) H. Linb., *Tilia rubra* DC. subsp. *caucasica* (Rupr.) V. Engl., *Prunus laurocerasus* L., *R. canina* L., and *Urtica dioica* L. Local people earn income from beekeeping and sheep, goats, and cattle farming. Indeed, beekeeping is quite widespread in the region. Both monofloral and polyfloral honey varieties are produced. Honey types produced from chestnut and forest roses as monofloral are in high demand. *Castanea sativa* Mill. honey is known as healing honey throughout the country with its antioxidant properties. Honey produced from *Rhododendron luteum* Sweet and *Rhododendron ponticum* L. is known as "mad honey" and is used to lower high blood pressure. The lethal effects of its excessive use, however, are also known by the local people (Karaköse et al., 2018b).

Although the study area is under the influence of the Euro-Siberian phytogeographical region, various anthropogenic effects such as field opening, illegal cutting, fire, livestock, and incorrect land use have allowed the spread of multiregional species. Cosmopolitan plant taxa within the multiregional group are seen across the world and can easily spread in most habitats. Six (1.2%) cosmopolitan plant taxa were identified from the study area. *Tanacetum parthenium* (L.) Sch. Bip., *Solanum americanum* Mill., *Cichorium intybus* L., and *Convolvulus arvensis* L. are found in forest opening, orchard, and clearings. Furthermore, there is an incorrect land use in the Eastern Black Sea region, where the Esenli FPU is located. Clear-cutting of the *A. glutinosa* (L.) Gaertn. subsp. *barbata* (C.A. Mey.) Yalt. forests is a practice that has been widely applied from past to present in the Eastern Black Sea for planting hazelnut orchards. Alien plant taxa prefer artificial areas (agriculture, hazelnut, roadside, etc.) as priority areas to enter a new ecosystem. Because of the low diversity of species in such artificial areas, not all of the available nutrients are used, and a niche gap occurs in these converted habitats. In this case, it is easier for new alien species to enter the converted habitat to fill this niche (Karaköse et al., 2018a). There are 12 naturalized plant taxa within the multiregional section. These alien taxa were recorded generally from the riparian sides of *A. glutinosa* forests. Ten of these alien plant taxa (*Amaranthus retroflexus* L., *Artemisia absinthium* L., *Bidens tripartita* L., *Commelina communis* L., *Erigeron canadensis* L., *Erigeron annuus* (L.) Pers., *Lepidium virginicum* L., *Microstegium vimineum* (Trin.) A. Camus, *Robinia pseudoacacia* L., and *Phytolacca americana* L.) are considered invasive plants (Karaköse et al., 2018a).

The most comprehensive floristic information for Giresun Province has been brought together in Flora of Turkey (Davis, 1965–1985; Davis et al., 1988; Güner et al., 2000). With this

study, a total of 463 vascular plant taxa were identified in Giresun Province, 55 of which were endemic. After this comprehensive study, Tuğ and Ketenoğlu (2004), Şenel et al. (2014), Hüseyinoğlu et al. (2017), and Karaköse et al. (2018a) conducted floristic studies in different regions of Giresun Province. With these floristic studies, Tuğ and Ketenoğlu (2004) with 119 taxa, Şenel et al. (2014) with 298 taxa, Hüseyinoğlu et al. (2017) with 113 taxa, and Karaköse et al. (2018a) with 28 taxa contributed to the flora of Giresun Province. In this latest study, 109 new taxa were recorded for the same province. As a result of all these studies, the number of plant taxa distributed in Giresun Province reached 1112, and the number of endemic taxa became 95. Thus, the endemism rate of Giresun Province has been updated from 11.9 to 8.5%.

The vulnerability of the forest ecosystems was already pointed out in previous studies. Having mountainous and steep terrain makes the Eastern Black Sea region (which contains the study area) even more sensitive. Today, the most effective factors that reduce and destroy plant biodiversity in the world are the fragmentation and contraction of habitats. As in many countries in recent years, rapid population growth and urbanization have led to increased pressure on natural resources in Turkey, too. Human beings interfere with natural habitats, narrowing the habitats of natural flora and damaging the natural pattern of habitats that trigger ecosystem diversity and species richness. As a result, population sizes and habitat types should be determined in order to protect target taxa (in protection categories of CR, EN, VU) determined as individuals. Some endemic plants, such as *Angelica sylvestris* var. *stenoptera*, *L. ciliatum*, *C. trachylepis*, *Cirsium pseudopersonata*, and *Scaligeria lazica*, identified in this study are under intense pressure because of anthropogenic effects. The habitats of these endemic plants are threatened by forestry, invasive plants, and anthropogenic effects (animal husbandry, overgrazing, land conversion, road construction, etc.). Therefore, in the management plan to be made within the planning unit, decision-makers need to pay attention to these threat factors. Moreover, the awareness of the local people living in the Esenli FPU about endemic and invasive plants should be increased. The present study provides (486 vascular plant taxa) further information that can help to develop protection and management of plant biological diversity. In addition, the study records 109 new plants in Giresun Province. Furthermore, these data obtained in this study are expected to contribute greatly to the new *Illustrated Flora of Turkey*.

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Appendix

PTERIDOPHYTA SECTION	
Class: Polypodiopsida	
Subclass: Equisetidae	
Order: Equisetales	
Equisetaceae Michx. ex DC.	
<i>Equisetum telmateia</i> Ehrh.	1223 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Multi., Per., G, 15. IX.2016, <i>M. Karaköse</i> 1187
Subclass: Polypodiidae	
Order: Osmundales	
Osmundaceae Martinov	
* <i>Osmunda regalis</i> L.	815 m, Derindere village, Hazelnut orchard near riparian side, Multi., Per., G, 20.V.2019, <i>M. Karaköse</i> 1465
Order: Polypodiales	
Suborder: Pteridinea	
Pteridaceae E.D.M. Kirchn.	
* <i>Adiantum capillus-veneris</i> L.	813 m, Derindere village, Hazelnut orchard near riparian side, Multi., Per., G, 20.V.2019, <i>M. Karaköse</i> 1466
Suborder: Dennstaedtiineae	
Dennstaedtiaceae Lotosy	
<i>Pteridium aquilinum</i> (L.) Kuhn	1120 m, Derindere village, mixed forest with <i>Fagus orientalis</i> - <i>Picea orientalis</i> - <i>Carpinus betulus</i> , Multi., Per., G, 26.VI.2015, <i>M. Karaköse</i> 1041
Suborder: Aspleniineae	
Aspleniaceae Newman	
* <i>Asplenium adiantum-nigrum</i> L.	1310 m, Güllüce village, mixed forest with <i>Picea orientalis</i> - <i>Fagus orientalis</i> , Multi., Per., G, 27.VI.2015, <i>M. Karaköse</i> 1144
<i>Asplenium scolopendrium</i> L.	860 m, Derindere village, Hazelnut orchard, Multi., Per., G, 20.V.2019, <i>M. Karaköse</i> 1448
* <i>Asplenium trichomanes</i> L.	1510 m, Akpınar village, <i>Picea orientalis</i> forest, Multi., Per., G, 26.VI.2015, <i>M. Karaköse</i> 1081
Woodsiaceae Herter	
* <i>Woodsia alpina</i> (Bolton) Gray	1154 m, Güllüce village, mixed forest with <i>Picea orientalis</i> - <i>Fagus orientalis</i> , Multi., Per., G, 14.IX.2016, <i>M. Karaköse</i> 1126
Blechnaceae Newman	
* <i>Blechnum spicant</i> (L.) Sm.	1640 m, Akpınar village, mixed forest with <i>Picea orientalis</i> - <i>Fagus orientalis</i> , Multi., Per., G, 14.IX.2016, <i>M. Karaköse</i> 1137
Athyriaceae Alston	
<i>Athyrium filix-femina</i> (L.) Roth	1507 m, Akpınar village, <i>Picea orientalis</i> forest, Multi., Per., G, 26.VI.2015, <i>M. Karaköse</i> 1082
Suborder: Polypodiineae	
Dryopteridaceae Herter	
<i>Dryopteris pseudomas</i> (Woll.) Holub & Pouzar	1050 m, Derindere village, <i>Picea orientalis</i> forest, Eur-Sib., Per., G, 26.VI.2016, <i>M. Karaköse</i> 1182
* <i>Dryopteris carthusiana</i> (Vill.) H.P. Fuchs	1050 m, Derindere village, <i>Picea orientalis</i> forest, Multi., Per., G, 26.VI.2016, <i>M. Karaköse</i> 1177

(Continued)

Appendix (Continued)

<i>Dryopteris filix-mas</i> (L.) Schott	1750 m, Güllüce village, mixed forest with <i>Fagus orientalis-Picea orientalis</i> , Multi., Per., G, 20.VI.2015, <i>M. Karaköse</i> 981
<i>Polystichum aculeatum</i> (L.) Roth ex Mert.	1218 m, Derindere village, mixed forest with <i>Picea orientalis-Carpinus betulus</i> , Multi., Per., G, 14.IX.2016, <i>M. Karaköse</i> 1145
* <i>Polystichum setiferum</i> (Forsk.) Moore ex Woyn.	1824 m, Akpınar village, mixed forest with <i>Picea orientalis-Pinus sylvestris</i> , Multi., Per., G, 20.V.2019, <i>M. Karaköse</i> 1439
Polypodiaceae J. Presl & C. Presl	
<i>Polypodium vulgare</i> L. var. <i>vulgare</i>	910 m, Derindere village, <i>Picea orientalis</i> forest, Multi., Per., G, 26.VI.2015, <i>M. Karaköse</i> 1083
SPERMATOPHYTA SECTION	
GYMNOSPERMAE SUB-SECTION	
Subclass: Pinidae	
Order: Pinales	
Pinaceae Spreng. ex F.Rudolphi	
<i>Pinus sylvestris</i> L. var. <i>hamata</i> Steven	1754 m, Çakrak village, <i>Pinus sylvestris</i> forest, Eur-Sib., Per., Ph, 23.VI.2015, <i>M. Karaköse</i> 1009
<i>Picea orientalis</i> (L.) Peterm.	1005 m, Derindere village, <i>Picea orientalis</i> forest, Eux., Per., Ph, 26.VI.2015, <i>M. Karaköse</i> 982
<i>Abies nordmanniana</i> (Steven) Spach subsp. <i>nordmanniana</i>	1439 m, Çakrak village, mixed forest with <i>Picea orientalis-Pinus sylvestris-Fagus orientalis</i> , Eux., Per., Ph, 24.VI.2015, <i>M. Karaköse</i> 1064
Order: Cupressales	
Cupressaceae Gray	
<i>Juniperus communis</i> L. var. <i>saxatilis</i> Pall.	1570 m, Çakrak village, mixed forest with <i>Pinus sylvestris-Picea orientalis</i> , Multi., Per., Ph, 22.VIII.2017, <i>M. Karaköse</i> 1234
Taxaceae Gray	
* <i>Taxus baccata</i> L.	1126 m, Derindere village, <i>Fagus orientalis</i> forest, Multi., Per., Ph, 20.V.2019, <i>M. Karaköse</i> 1420
ANGIOSPERMAE SUB-SECTION	
Clade: MAGNOLIIDS	
Order: Piperales	
Aristolochiaceae Juss.	
<i>Aristolochia pontica</i> Lam.	910 m, Derindere village, <i>Picea orientalis</i> forest, Eur-Sib., Per., H, 26.VI.2015, <i>M. Karaköse</i> 1094
Clade: MONOCOTS	
Order: Alismatales	
Araceae Juss.	
<i>Arum maculatum</i> L.	1314 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Multi., Per., G, 15. IX.2017, <i>M. Karaköse</i> 1272
Alismataceae Vent.	
<i>Alisma plantago-aquatica</i> L.	1252 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., H, 14. IX.2017, <i>M. Karaköse</i> 1301
Order: Dioscoreales	
Dioscoreaceae R.Br.	
<i>Dioscorea communis</i> (L.) Caddick & Wilkin	1124 m, Derindere village, <i>Fagus orientalis</i> forest, Multi., Per., G, 19.VI.2015, <i>M. Karaköse</i> 1079
Order: Liliales	

(Continued)

Appendix (Continued)

Melanthiaceae Batsch ex Borkh.	
* <i>Paris incompleta</i> M. Bieb.	1625 m, Güllüce village, <i>Fagus orientalis</i> forest, Eux., Per., G, 28.VI.2016, <i>M. Karaköse</i> 1138
<i>Veratrum album</i> L.	1689 m, Güllüce village, mixed forest with <i>Picea orientalis</i> - <i>Pinus sylvestris</i> , Eur-Sib., Per., G, 23.VI.2015, <i>M. Karaköse</i> 1039
Colchicaceae DC.	
<i>Colchicum speciosum</i> Steven	1671 m, Güllüce village, Forest opening, Eur-Sib., Per., G, 15.IX.2018, <i>M. Karaköse</i> 1373
<i>Colchicum szovitsii</i> Fisch. & C.A. Mey. subsp. <i>szovitsii</i>	1767 m, Güllüce village, Forest opening, Ir-Tur., Per., G, 15.IX.2018, <i>M. Karaköse</i> 1377
Smilacaceae Vent	
* <i>Smilax excelsa</i> L.	1036 m, Derindere village, <i>Carpinus betulus</i> forest, Eux., Per., Ph, 11.IX.2019, <i>M. Karaköse</i> 1459
Liliaceae Juss.	
<i>Gagea bohemica</i> (Zauschn.) Schult. & Schult. f.	1836 m, Akpınar village, Pasture, Multi., Per., G, 10.IV.2018, <i>M. Karaköse</i> 1357
<i>Lilium ciliatum</i> P.H. Davis	1410 m, Güllüce village, Pasture, Eux., Per., G, End (EN), 07.VI.2018, <i>M. Karaköse</i> 1374
<i>Lilium armenum</i> (Miscz. ex Grossh.) Manden.	1712 m, Güllüce village, <i>Picea orientalis</i> forest, Eux., Per., G, 15.V.2019, <i>M. Karaköse</i> 1423
Order: Asparagales	
Orchidaceae Juss.	
<i>Dactylorhiza euxina</i> (Nevski) H. Baumann & Künkele subsp. <i>euxina</i>	1632 m, Akpınar village, Forest opening, Eux., Per., G, 07.VI.2018, <i>M. Karaköse</i> 1393
<i>Dactylorhiza romana</i> (Seb.) Soó subsp. <i>georgica</i> (Klinge) Soó ex Renz & Taubenheim	1327 m, Akpınar village, Riparian side with <i>Alnus glutinosa</i> , Eux., Per., G, 15.V.2019, <i>M. Karaköse</i> 1408
<i>Dactylorhiza urvilleana</i> (Steudel) Baumann & Künkele subsp. <i>urvilleana</i>	1527 m, Akpınar village, Forest opening, Eux., Per., G, 19.IV.2018, <i>M. Karaköse</i> 1367
<i>Epipactis pontica</i> Taubenheim	1615 m, Güllüce village, mixed forest with <i>Fagus orientalis</i> - <i>Picea orientalis</i> , Eux., Per., G, 08.VI.2016, <i>M. Karaköse</i> 1119
<i>Limodorum abortivum</i> (L.) Sw. var. <i>abortivum</i>	1760 m, Çakrak village, <i>Pinus sylvestris</i> forest, Multi., Per., G, 07.V.2018, <i>M. Karaköse</i> 1394
<i>Neotinea tridentata</i> (Scop.) R.M. Bateman, Pridgeon & M.W. Chase	1712 m, Çakrak village, Pasture, Med., Per., G, 17.V.2018, <i>M. Karaköse</i> 1385
<i>Neottia nidus-avis</i> (L.) Rich.	1678 m, Güllüce village, <i>Picea orientalis</i> forest, Eur-Sib., Per., G, 23.VI.2015, <i>M. Karaköse</i> 1063
<i>Orchis mascula</i> (L.) L.	1755 m, Güllüce village, Forest opening, E. Med., Per., G, 19.IV.2018, <i>M. Karaköse</i> 1382
* <i>Platanthera bifolia</i> (L.) Rich.	1760 m, Çakrak village, <i>Pinus sylvestris</i> forest, Eur-Sib., Per., G, 17.V.2018, <i>M. Karaköse</i> 1395
<i>Platanthera chlorantha</i> (Cruster) Rchb.	1439 m, Güllüce village, mixed forest with <i>Picea orientalis</i> - <i>Pinus sylvestris</i> - <i>Fagus orientalis</i> , Multi., Per., G, 24.VI.2015, <i>M. Karaköse</i> 1078
Iridaceae Juss.	
<i>Crocus aerius</i> Herb.	1771 m, Güllüce village, Forest opening, Eur-Sib., Per., G, End (EN), 05.X.2018, <i>M. Karaköse</i> 1376
<i>Crocus suworowianus</i> K. Koch	1785 m, Güllüce village, Forest opening, Multi., Per., G, 05.X.2018, <i>M. Karaköse</i> 1378
<i>Iris lazica</i> Albov	866 m, Derindere village, Hazelnut orchard, Eux., Per., G., 20.V.2019, <i>M. Karaköse</i> 1464

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Appendix (Continued)

Amaryllidaceae J.St.-Hil.	
<i>Allium olympicum</i> Boiss.	1991 m, Akpınar village, <i>Pinus sylvestris</i> forest, Eux., Per., G, End (LC), 22.VIII.2017, <i>M. Karaköse</i> 1226
Asparagaceae Juss.	
<i>Ruscus colchicus</i> Yeo	1785 m, Güllüce village, <i>Picea orientalis</i> forest, Eux., Per., G, 23.VI.2015, <i>M. Karaköse</i> 1007
<i>Polygonatum orientale</i> Desf.	1314 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eux., Per., G, 15.VI.2015, <i>M. Karaköse</i> 1062
<i>Muscari armeniacum</i> Leichtlin ex Baker	1730 m, Güllüce village, Pasture, Multi., Per., G, 23.V.2016, <i>M. Karaköse</i> 1142
* <i>Muscari neglectum</i> Guss. ex Ten.	1785 m, Güllüce village, Forest opening, Multi., Per., G, 30.VI.2016, <i>M. Karaköse</i> 1161
* <i>Ornithogalum sigmoideum</i> Freyn & Sint.	1830 m, Akpınar village, Pasture, Eur-Sib., Per., G, 10.IV.2018, <i>M. Karaköse</i> 1358
Order: Commelinales	
Commelinaceae Mirb.	
<i>Commelina communis</i> L.	864 m, Derindere village, Hazelnut orchard, Natr., Per., H, 07.IX.2019, <i>M. Karaköse</i> 1455
Order: Poales	
Juncaceae Juss.	
<i>Juncus alpigenus</i> K. Koch	1547 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eux., Per., H, 15.IX.2017, <i>M. Karaköse</i> 1305
Cyperaceae Juss.	
* <i>Carex liparocarpos</i> Gaudin subsp. <i>bordzilowskii</i> (V.I. Krecz.) Egorova	1301 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Hyr-Eux., Per., H, 24.VI.2016, <i>M. Karaköse</i> 1143
<i>Carex leporina</i> L.	1222 m, Derindere village, mixed forest with <i>Picea orientalis-Carpinus betulus</i> , Eur-Sib., Per., H, 15.IX.2017, <i>M. Karaköse</i> 1307
Poaceae Barnhart	
<i>Agrostis capillaris</i> L. var. <i>capillaris</i>	1570 m, Çakrak village, mixed forest with <i>Pinus sylvestris-Picea orientalis</i> , Eur-Sib., Per., H, 26.VI.2015, <i>M. Karaköse</i> 1101
<i>Alopecurus arundinaceus</i> Poir.	871 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., H, 14. IX.2017, <i>M. Karaköse</i> 1298
<i>Brachypodium sylvaticum</i> (Huds.) P. Beauv.	1301 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Eur-Sib., Per., H, 24.VI.2015, <i>M. Karaköse</i> 1080
<i>Briza media</i> L.	1991 m, Akpınar village, <i>Pinus sylvestris</i> forest, Multi., Per., H, 22.VIII.2017, <i>M. Karaköse</i> 1227
<i>Bromus arvensis</i> L.	965 m, Derindere village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Multi., Ann., Th, 26.VI.2016, <i>M. Karaköse</i> 1175
<i>Cynosurus echinatus</i> L.	1252 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Med., Ann., Th, 14. IX.2017, <i>M. Karaköse</i> 1302
<i>Dactylis glomerata</i> L. subsp. <i>glomerata</i>	1570 m, Çakrak village, mixed forest with <i>Pinus sylvestris-Picea orientalis</i> , Eur-Sib., Per., H, 26.VI.2015, <i>M. Karaköse</i> 1040
<i>Deschampsia flexuosa</i> (L.) Trin.	2027 m, Güllüce village, <i>Pinus sylvestris</i> forest, Eur-Sib., Per., H, 19.IX.2017, <i>M. Karaköse</i> 1238
* <i>Festuca drymeja</i> Mert. & W.D.J. Koch	1428 m, Akpınar village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., H, 19. IX.2017, <i>M. Karaköse</i> 1254
<i>Festuca heterophylla</i> Lam.	1786 m, Güllüce village, <i>Picea orientalis</i> forest, Eux., Per., H, 23.VI.2015, <i>M. Karaköse</i> 1008
<i>Holcus lanatus</i> L.	1328 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., H, 13. VII.2017, <i>M. Karaköse</i> 1218

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Appendix (Continued)

<i>Microstegium vimineum</i> (Trin.) A. Camus	825 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Natr., Ann., Th, 14. IX.2017, <i>M. Karaköse</i> 1293
<i>Phleum montanum</i> K. Koch subsp. <i>montanum</i>	1507 m, Güllüce village, <i>Picea orientalis</i> forest, Multi., Per., H, 29.VI.2016, <i>M. Karaköse</i> 1173
<i>Poa longifolia</i> Trin.	871 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Eux., Per., H, 14. IX.2017, <i>M. Karaköse</i> 1231
<i>Poa pratensis</i> L.	1222 m, Derindere village, mixed forest with <i>Picea orientalis-Carpinus betulus</i> , Multi., Per., H, 23.VI.2016, <i>M. Karaköse</i> 1157
<i>Trisetum flavescens</i> (L.) P. Beauv.	1360 m, Akpınar village, mixed forest with <i>Picea orientalis-Pinus sylvestris</i> , Eur-Sib., Per., H, 23.VI.2016, <i>M. Karaköse</i> 1165
<i>Zea mays</i> L. subsp. <i>mays</i>	864 m, Derindere village, Hazelnut orchard, Cul., Ann., Th, 20.VIII.2019, <i>M. Karaköse</i> 1441
Clade: EUDICOTS	
Order: Ranunculales	
Papaveraceae Juss.	
<i>Chelidonium majus</i> L.	1315 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., H, 13. IX.2017, <i>M. Karaköse</i> 1284
* <i>Fumaria officinalis</i> subsp. <i>cilicica</i> (Hauskn.) Lidén	1592 m, Güllüce village, Road side, Ir-Tur., Ann., Th, 10.VI.2018, <i>M. Karaköse</i> 1335
<i>Papaver triniifolium</i> Boiss.	1592 m, Güllüce village, Road side, Ir-Tur., Bia., H, End (LC), 10.VI.2018, <i>M. Karaköse</i> 1336
Berberidaceae Juss.	
<i>Berberis vulgaris</i> L.	2057 m, Akpınar village, Pasture, Multi., Per., Ph, 11.IX.2019, <i>M. Karaköse</i> 1460
Ranunculaceae Juss.	
<i>Aconitum orientale</i> Mill.	1755 m, Güllüce village, Forest opening, Eux., Per., H, 15.IX.2018, <i>M. Karaköse</i> 1396
* <i>Actaea spicata</i> L.	1347 m, Güllüce village, <i>Picea orientalis</i> forest, Multi., Per., G, 24.VI.2015, <i>M. Karaköse</i> 1084
* <i>Anemone caucasica</i> Willd. ex Rupr.	1620 m, Çakrak village, Pasture, Eux., Per., G, 10.IV.2018, <i>M. Karaköse</i> 1308
<i>Anemone narcissiflora</i> L. subsp. <i>narcissiflora</i>	1310 m, Çakrak village, Pasture, Eur-Sib., Per., H, 15.VI.2018, <i>M. Karaköse</i> 1354
* <i>Clematis vitalba</i> L.	866 m, Derindere village, Hazelnut orchard, Multi., Per., Ph, 20.V.2019, <i>M. Karaköse</i> 1450
* <i>Ficaria verna</i> Huds. subsp. <i>bulbilifera</i> Á. Löve & D. Löve	862 m, Derindere village, Hazelnut orchard, Multi., Per., G, 20.V.2019, <i>M. Karaköse</i> 1447
* <i>Helleborus orientalis</i> Lam.	862 m, Derindere village, Hazelnut orchard, Eux., Per., H, 20.V.2019, <i>M. Karaköse</i> 1445
<i>Ranunculus cappadocicus</i> Willd.	1678 m, Güllüce village, <i>Picea orientalis</i> forest, Eux., Per., G, 23.VI.2015, <i>M. Karaköse</i> 983
<i>Ranunculus kotschy</i> Boiss.	916 m, Derindere village, Road side, Multi., Per., H, 09.VII.2018, <i>M. Karaköse</i> 1387
* <i>Ranunculus muricatus</i> L.	867 m, Derindere village, Hazelnut orchard, Multi., Ann., Th, 20.V.2019, <i>M. Karaköse</i> 1449
<i>Ranunculus repens</i> L.	1439 m, Güllüce village, mixed forest with <i>Picea orientalis-Pinus sylvestris-Fagus orientalis</i> , Multi., Per., G, 24.VI.2015, <i>M. Karaköse</i> 1010
<i>Thalictrum minus</i> L. var. <i>minus</i>	1315 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Multi., Per., H, 13. IX.2017, <i>M. Karaköse</i> 1282
Order: Proteales	
Platanaceae T. Lestib.	
* <i>Platanus orientalis</i> L.	915 m, Derindere village, Riparian side, Multi., Per., Ph, 26.VI.2019, <i>M. Karaköse</i> 1461
Clade: SUPERROSIDS	

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Appendix (Continued)

Order: Saxifragales	
Grossulariaceae DC.	
* <i>Ribes petraeum</i> Wulfen	1505 m, Çakrak village, Riparian side with <i>Alnus glutinosa</i> , Eux., Per., Ph, 07.IX.2019, <i>M. Karaköse</i> 1444
Saxifragaceae Juss.	
<i>Saxifraga cymbalaria</i> L.	1315 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Multi., Ann., Th, 13. IX.2016, <i>M. Karaköse</i> 1129
<i>Saxifraga rotundifolia</i> L. subsp. <i>rotundifolia</i>	1547 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., H, 15. IX.2017, <i>M. Karaköse</i> 1244
Crassulaceae J.St.-Hil.	
* <i>Sedum acre</i> L.	1592 m, Çakrak village, Road side, Multi., Per., H, 25.VIII.2018, <i>M. Karaköse</i> 1337
<i>Sedum gracile</i> C.A. Mey.	1592 m, Güllüce village, Road side, Hyr-Eux., Per., H, 25.VIII.2018, <i>M. Karaköse</i> 1316
<i>Sedum pallidum</i> M. Bieb.	1222 m, Derindere village, mixed forest with <i>Picea orientalis-Carpinus betulus</i> , Eux., Ann., Th, 29.VI.2016, <i>M. Karaköse</i> 1151
<i>Sedum stoloniferum</i> S.G. Gmel.	1101 m, Derindere village, mixed forest with <i>Fagus orientalis-Picea orientalis</i> , Hyr-Eux., Per., H, 24.VI.2015, <i>M. Karaköse</i> 991
<i>Sedum telephium</i> L.	1338 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., H, 13. IX.2017, <i>M. Karaköse</i> 1285
Clade: ROSIDS	
Order: Fabales	
Fabaceae Lindl.	
* <i>Anthyllis vulneraria</i> L. subsp. <i>boissieri</i> (Sagorski) Bornm.	1991 m, Akpınar village, <i>Pinus sylvestris</i> forest, Multi., Bia., H, 29.VI.2016, <i>M. Karaköse</i> 1150
<i>Argyrolobium biebersteinii</i> P.W. Ball	1804 m, Akpınar village, mixed forest with <i>Picea orientalis-Pinus sylvestris</i> , Hyr-Eux., Per., H, 28.VI.2015, <i>M. Karaköse</i> 1016
<i>Astracantha plumosa</i> (Willd.) Podl.	1550 m, Çakrak village, <i>Pinus sylvestris</i> forest, Ir-Tur., Per., Ch, 22.VIII.2017, <i>M. Karaköse</i> 1232
<i>Astragalus amoenus</i> Fenzl	1638 m, Çakrak village, <i>Pinus sylvestris</i> forest, Ir-Tur., Per., H, End (LC), 22.VIII.2017, <i>M. Karaköse</i> 1267
<i>Astragalus eriocarpus</i> DC.	1341 m, Akpınar village, <i>Picea orientalis</i> forest, Ir-Tur., Per., H, 29.VI.2016, <i>M. Karaköse</i> 1183
<i>Astragalus glycyphylloides</i> DC.	1461 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Eur-Sib., Per., H, 25.VI.2015, <i>M. Karaköse</i> 1103
* <i>Bituminaria acaulis</i> (Hoffm.) C.H. Stirt.	1504 m, Çakrak village, <i>Pinus sylvestris</i> forest, Eux., Per., H, 15.IX.2015, <i>M. Karaköse</i> 1017
* <i>Bituminaria bituminosa</i> (L.) C.H. Stirt.	1471 m, Güllüce village, mixed forest with <i>Fagus orientalis-Carpinus betulus</i> , Med., Per., H, 06.IX.2017, <i>M. Karaköse</i> 1255
<i>Cytisus austriacus</i> L. subsp. <i>pygmaeus</i> (Willd.) Briq.	1735 m, Akpınar village, Road side, Eur-Sib., Per., Ch, 23.V.2015, <i>M. Karaköse</i> 1015
<i>Lathyrus czechottianus</i> Bässler	1991 m, Akpınar village, <i>Pinus sylvestris</i> forest, Eur-Sib., Per., H, End (LC), 22.VIII.2017, <i>M. Karaköse</i> 1265
<i>Lathyrus laxiflorus</i> (Desf.) O. Kuntze subsp. <i>laxiflorus</i>	965 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Multi., Per., H, 29.VI.2015, <i>M. Karaköse</i> 1066
* <i>Lathyrus roseus</i> Steven subsp. <i>roseus</i>	1735 m, Çakrak village, Pasture, Hyr-Eux., Per., H, 23.V.2019, <i>M. Karaköse</i> 1425
<i>Lathyrus tukhtensis</i> Czeccott	1771 m, Çakrak village, <i>Pinus sylvestris</i> forest, Eur-Sib., Per., H, End (LC), 22.VIII.2017, <i>M. Karaköse</i> 1233
* <i>Lathyrus vernus</i> (L.) Bernh.	1220 m, Derindere village, mixed forest with <i>Picea orientalis-Carpinus betulus</i> , Eur-Sib., Per., H, 24.VI.2016, <i>M. Karaköse</i> 1148

(Continued)

Appendix (Continued)

<i>Lotus corniculatus</i> L. var. <i>corniculatus</i>	1439 m, Güllüce village, mixed forest with <i>Picea orientalis</i> - <i>Pinus sylvestris</i> - <i>Fagus orientalis</i> , Multi., Per., H, 24.VI.2015, <i>M. Karaköse</i> 1068
<i>Medicago falcata</i> L.	1605 m, Akpınar village, <i>Pinus sylvestris</i> forest, Multi., Per., H, 22.VIII.2016, <i>M. Karaköse</i> 1111
* <i>Medicago minima</i> (L.) L. var. <i>minima</i>	1013 m, Derindere village, mixed forest with <i>Fagus orientalis</i> - <i>Carpinus betulus</i> , Multi., Ann., Th, 07.VI.2018, <i>M. Karaköse</i> 1390
<i>Medicago x varia</i> Martyn	1592 m, Güllüce village, Road side, Multi., Per., H, 25.VIII.2018, <i>M. Karaköse</i> 1330
<i>Melilotus officinalis</i> (L.) Pall.	1735 m, Güllüce village, Road side, Multi., Ann., Th, 15.IX.2018, <i>M. Karaköse</i> 1319
<i>Robinia pseudoacacia</i> L.	892 m, Derindere village, Road side, Natr., Per., Ph, 08.VII.2019, <i>M. Karaköse</i> 1431
<i>Securigera orientalis</i> (Mill.) Lassen subsp. <i>Orientalis</i>	1570 m, Çakrak village, mixed forest with <i>Pinus sylvestris</i> - <i>Picea orientalis</i> , Multi., Per., H, 22.VIII.2015, <i>M. Karaköse</i> 1019
<i>Securigera varia</i> (L.) Lassen	1570 m, Çakrak village, mixed forest with <i>Pinus sylvestris</i> - <i>Picea orientalis</i> , E. Med., Per., H, 22.VIII.2016, <i>M. Karaköse</i> 1112
* <i>Trifolium arvense</i> L. var. <i>arvense</i>	890 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Multi., Ann., Th, 09. IX.2017, <i>M. Karaköse</i> 1268
<i>Trifolium badium</i> Schreb.	916 m, Derindere village, Road side, Hyr-Eux., Per., H, 09.VII.2018, <i>M. Karaköse</i> 1389
<i>Trifolium campestre</i> Schreb. subsp. <i>campestre</i>	1804 m, Akpınar village, mixed forest with <i>Picea orientalis</i> - <i>Pinus sylvestris</i> , Multi., Ann., Th, 28.VI.2018, <i>M. Karaköse</i> 1360
<i>Trifolium canescens</i> Willd.	1689 m, Akpınar village, mixed forest with <i>Picea orientalis</i> - <i>Pinus sylvestris</i> , Hyr-Eux., Per., H, 23.VI.2016, <i>M. Karaköse</i> 1158
<i>Trifolium elongatum</i> Willd.	1222 m, Derindere village, mixed forest with <i>Picea orientalis</i> - <i>Carpinus betulus</i> , Multi., Per., H, End (LC), 29.VI.2015, <i>M. Karaköse</i> 1067
* <i>Trifolium medium</i> L. var. <i>medium</i>	1013 m, Derindere village, mixed forest with <i>Fagus orientalis</i> - <i>Carpinus betulus</i> , Multi., Per., H, 30.VI.2016, <i>M. Karaköse</i> 1110
<i>Trifolium pratense</i> L. var. <i>pratense</i>	1220 m, Derindere village, mixed forest with <i>Picea orientalis</i> - <i>Carpinus betulus</i> , Multi., Per., H, 24.VI.2016, <i>M. Karaköse</i> 1149
<i>Trifolium repens</i> L. var. <i>repens</i>	1314 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Multi., Per., H, 15. IX.2015, <i>M. Karaköse</i> 1018
<i>Vicia tenuifolia</i> Roth	1439 m, Güllüce village, mixed forest with <i>Picea orientalis</i> - <i>Pinus sylvestris</i> - <i>Fagus orientalis</i> , Multi., Per., H, 24.VI.2015, <i>M. Karaköse</i> 1065
<i>Vicia crocea</i> (Desf.) Fritsch	1492 m, Güllüce village, <i>Fagus orientalis</i> forest, Hyr-Eux., Per., H, 24.VI.2016, <i>M. Karaköse</i> 1189
Polygalaceae Hoffmanns. & Link	
<i>Polygala vulgaris</i> L.	1638 m, Güllüce village, mixed forest with <i>Picea orientalis</i> - <i>Fagus orientalis</i> , Eur-Sib., Per., Ch, 28.VI.2016, <i>M. Karaköse</i> 1139
Order: Rosales	
Rosaceae Juss.	
<i>Alchemilla caucasica</i> Buser	1678 m, Akpınar village, <i>Picea orientalis</i> forest, Eux., Per., H, 23.VI.2015, <i>M. Karaköse</i> 1022
<i>Alchemilla mollis</i> (Buser) Rothm.	1645 m, Güllüce village, <i>Picea orientalis</i> forest, Multi., Per., H, 22.VI.2015, <i>M. Karaköse</i> 990
<i>Alchemilla retinervis</i> Buser	1991 m, Akpınar village, <i>Pinus sylvestris</i> forest, Eux., Per., H, 22.VIII.2017, <i>M. Karaköse</i> 1221
* <i>Aremonia agrimonoides</i> (L.) DC. subsp. <i>agrimonoides</i>	1696 m, Derindere village, mixed forest with <i>Fagus orientalis</i> - <i>Picea orientalis</i> , Eur-Sib., Per., H, 23.VI.2015, <i>M. Karaköse</i> 1020
<i>Aruncus vulgaris</i> (Maxim.) Raf. ex H. Hara	1462 m, Güllüce village, mixed forest with <i>Picea orientalis</i> - <i>Fagus orientalis</i> , Multi., Per., H, 25.VI.2015, <i>M. Karaköse</i> 1104
<i>Crataegus monogyna</i> Jacq. var. <i>monogyna</i>	1615 m, Güllüce village, mixed forest with <i>Fagus orientalis</i> - <i>Picea orientalis</i> , Multi., Per., Ph, 17.VIII.2015, <i>M. Karaköse</i> 1023

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Appendix (Continued)

<i>Crataegus rhipidophylla</i> Gand. var. <i>rhipidophylla</i>	1351 m, Akpınar village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Multi., Per., Ph, 22.VIII.2015, <i>M. Karaköse</i> 1070
* <i>Cydonia oblonga</i> Mill.	1735 m, Güllüce village, Orchard, Cult., Per., Ph, 15.IX.2018, <i>M. Karaköse</i> 1338
<i>Fragaria vesca</i> L.	1458 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Eur-Sib., Per., H, 25.VI.2015, <i>M. Karaköse</i> 989
<i>Geum coccineum</i> Sibth. & Sm.	1730 m, Derindere village, Pasture, Eur-Sib., Per., H, 23.V.2018, <i>M. Karaköse</i> 1392
<i>Geum urbanum</i> L.	1751 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Eur-Sib., Per., H, 20.VIII.2015, <i>M. Karaköse</i> 1046
* <i>Malus sylvestris</i> (L.) Mill. subsp. <i>sylvestris</i>	1735 m, Güllüce village, Orchard, Cult., Per., Ph, 15.IX.2018, <i>M. Karaköse</i> 1343
<i>Potentilla crantzii</i> (Crantz) Beck ex Fritsch	1592 m, Güllüce village, Road side, Eur-Sib., Per., H, 25.VIII.2018, <i>M. Karaköse</i> 1331
<i>Potentilla recta</i> L.	1693 m, Güllüce village, Pasture, Multi., Per., H, 17.V.2017, <i>M. Karaköse</i> 1262
* <i>Prunus avium</i> (L.) L.	890 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Cult., Per., Ph, 09.IX.2018, <i>M. Karaköse</i> 1324
* <i>Prunus cerasifera</i> Ehrh.	1735 m, Güllüce village, Orchard, Cult., Per., Ph, 15.IX.2018, <i>M. Karaköse</i> 1327
* <i>Prunus cerasus</i> L.	1735 m, Güllüce village, Orchard, Cult., Per., Ph, 15.IX.2018, <i>M. Karaköse</i> 1342
<i>Prunus domestica</i> L.	1735 m, Güllüce village, Orchard, Cult., Per., Ph, 15.IX.2018, <i>M. Karaköse</i> 1329
<i>Prunus laurocerasus</i> L.	891 m, Derindere village, mixed forest with <i>Picea orientalis-Carpinus betulus</i> , Multi., Per., Ph, 28.VI.2016, <i>M. Karaköse</i> 1193
<i>Pyrus caucasica</i> Fed.	1426 m, Akpınar village, Orchard, Cult., Per., Ph, 22.VIII.2015, <i>M. Karaköse</i> 1024
* <i>Pyrus elaeagnifolia</i> Pall. subsp. <i>kotschyana</i> (Boiss.) Browicz	1605 m, Akpınar village, <i>Pinus sylvestris</i> forest, Multi., Per., Ph, 22.VIII.2017, <i>M. Karaköse</i> 1228
<i>Rosa canina</i> L.	1120 m, Derindere village, mixed forest with <i>Fagus orientalis-Picea orientalis-Carpinus betulus</i> , Multi., Per., Ph, 26.VI.2015, <i>M. Karaköse</i> 1069
* <i>Rubus canescens</i> DC. var. <i>glabratus</i> (Godr.) Davis & Meikle	1220 m, Derindere village, mixed forest with <i>Picea orientalis-Carpinus betulus</i> , Eur-Sib., Per., Ph, 24.VI.2016, <i>M. Karaköse</i> 1160
<i>Rubus hirtus</i> Waldst. & Kit.	1346 m, Derindere village, <i>Picea orientalis</i> forest, Eur-Sib., Per., Ph, 24.VI.2015, <i>M. Karaköse</i> 988
<i>Rubus idaeus</i> L.	1615 m, Güllüce village, <i>Picea orientalis</i> forest, Multi., Per., Ph, 23.VI.2017, <i>M. Karaköse</i> 1045
<i>Sanguisorba minor</i> L. subsp. <i>balearica</i> (Bourg. ex Nyman) Muñoz Garm. & C. Navarro	1504 m, Çakrak village, <i>Pinus sylvestris</i> forest, Multi., Per., H, 15.IX.2015, <i>M. Karaköse</i> 1021
<i>Sibbaldia parviflora</i> Willd. var. <i>parviflora</i>	1771 m, Güllüce village, Forest opening, Multi., Per., Ch, 15.IX.2018, <i>M. Karaköse</i> 1380
<i>Sorbus aucuparia</i> L.	1300 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Eur-Sib., Per., Ph, 27.VI.2015, <i>M. Karaköse</i> 1089
* <i>Sorbus torminalis</i> (L.) Crantz var. <i>torminalis</i>	1118 m, Derindere village, mixed forest with <i>Fagus orientalis-Picea orientalis-Carpinus betulus</i> , Multi., Per., Ph, 26.VI.2015, <i>M. Karaköse</i> 1097
<i>Sorbus umbellata</i> (Desf.) Fritsch	1755 m, Güllüce village, Forest opening, Multi., Per., Ph, 15.IX.2019, <i>M. Karaköse</i> 1422
Ulmaceae Mirb.	
* <i>Ulmus glabra</i> Huds.	1505 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., Ph, 07.IX.2019, <i>M. Karaköse</i> 1457
Moraceae Gaudich.	
* <i>Morus alba</i> L.	1505 m, Güllüce village, Orchard, Cult., Per., Ph, 07.IX.2019, <i>M. Karaköse</i> 1456
Urticaceae Juss.	
<i>Urtica dioica</i> L. subsp. <i>dioica</i>	1750 m, Güllüce village, mixed forest with <i>Fagus orientalis-Picea orientalis</i> , Eur-Sib., Per., H, 20.VIII.2015, <i>M. Karaköse</i> 1059

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Appendix (Continued)

* <i>Urtica urens</i> L.	890 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Multi., Per., H, 09. IX.2018, <i>M. Karaköse</i> 1345
Order: Fagales	
Fagaceae Dumort.	
<i>Castanea sativa</i> Mill.	965 m, Derindere village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Eur-Sib., Per., Ph, 29.VI.2015, <i>M. Karaköse</i> 1095
<i>Fagus orientalis</i> Lipsky	975 m, Derindere village, <i>Fagus orientalis</i> forest, Eur-Sib., Per., Ph, 29.VI.2015, <i>M. Karaköse</i> 1060
* <i>Quercus petraea</i> (Matt.) Liebl. subsp. <i>iberica</i> (Steven ex M. Bieb.) Krassiln.	1300 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Multi., Per., Ph, 27.VI.2015, <i>M. Karaköse</i> 1075
Juglandaceae DC. ex Perleb	
* <i>Juglans regia</i> L.	867 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Multi., Per., Ph, 14. IX.2017, <i>M. Karaköse</i> 1279
Betulaceae Gray	
<i>Alnus glutinosa</i> (L.) Gaertn. subsp. <i>barbata</i> (C.A. Mey.) Yalt.	1340 m, Güllüce village, Riparian side, Eux., Per., Ph, 18.VII.2016, <i>M. Karaköse</i> 1211
<i>Carpinus betulus</i> L.	1120 m, Derindere village, mixed forest with <i>Fagus orientalis-Picea orientalis-Carpinus betulus</i> , Eur-Sib., Per., Ph, 26.VI.2015, <i>M. Karaköse</i> 1100
<i>Corylus avellana</i> L. var. <i>avellana</i>	1340 m, Güllüce village, <i>Picea orientalis</i> forest, Eur-Sib., Per., Ph, 24.VI.2015, <i>M. Karaköse</i> 1076
<i>Corylus maxima</i> Mill.	867 m, Derindere village, Hazelnut orchard, Cult., Per., Ph, 20.V.2019, <i>M. Karaköse</i> 1419
Order: Celastrales	
Celastraceae R. Br.	
* <i>Euonymus europaeus</i> L.	889 m, Derindere village, mixed forest with <i>Picea orientalis-Carpinus betulus</i> , Eur-Sib., Per., Ph, 28.VI.2015, <i>M. Karaköse</i> 1088
Order: Oxalidales	
Oxalidaceae R. Br.	
<i>Oxalis acetosella</i> L.	1154 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Multi., Per., H, 06.VIII.2015, <i>M. Karaköse</i> 987
Order: Malpighiales	
Hypericaceae Juss.	
<i>Hypericum orientale</i> L.	1689 m, Akpınar village, mixed forest with <i>Picea orientalis-Pinus sylvestris</i> , Multi., Per., H, 23.VI.2015, <i>M. Karaköse</i> 1014
<i>Hypericum androsaemum</i> L.	1127 m, Derindere village, <i>Fagus orientalis</i> forest, Eur-Sib., Per., Ch, 27.VI.2015, <i>M. Karaköse</i> 1096
<i>Hypericum perforatum</i> L. subsp. <i>veronense</i> (Schrank) H. Linb.	1605 m, Akpınar village, <i>Pinus sylvestris</i> forest, Multi., Per., H, 22.VIII.2016, <i>M. Karaköse</i> 1109
<i>Hypericum venustum</i> Fenzl	1514 m, Akpınar village, mixed forest with <i>Pinus sylvestris-Picea orientalis</i> , Multi., Per., H, 30.VI.2016, <i>M. Karaköse</i> 1167
<i>Hypericum linarioides</i> Bosse	1991 m, Akpınar village, <i>Pinus sylvestris</i> forest, Multi., Per., H, 22.VIII.2017, <i>M. Karaköse</i> 1220
Violaceae Batsch	
<i>Viola oreades</i> M. Bieb.	1320 m, Güllüce village, Pasture, Multi., Per., H, 20.V.2017, <i>M. Karaköse</i> 1260
* <i>Viola kitaibeliana</i> Schult.	1315 m, Çakrak village, Pasture, Multi., Ann., Th, 20.V.2019, <i>M. Karaköse</i> 1451
* <i>Viola sieheana</i> W. Becker	1341 m, Güllüce village, <i>Picea orientalis</i> forest, Multi., Per., H, 24.VI.2015, <i>M. Karaköse</i> 985
Salicaceae Mirb.	

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Appendix (Continued)

<i>Populus nigra</i> L. subsp. <i>nigra</i>	1132 m, Derindere village, Road side, Eur-Sib., Per., Ph, 25.VIII.2017, <i>M. Karaköse</i> 1288
<i>Populus tremula</i> L. subsp. <i>tremula</i>	1592 m, Güllüce village, Road side, Multi., Per., Ph, 25.VIII.2018, <i>M. Karaköse</i> 1320
* <i>Salix alba</i> L.	869 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., Ph, 14. IX.2018, <i>M. Karaköse</i> 1383
* <i>Salix babylonica</i> L.	871 m, Derindere village, Road side, Multi., Per., Ph, 14.IX.2018, <i>M. Karaköse</i> 1368
<i>Salix caprea</i> L.	1315 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., Ph, 13. IX.2017, <i>M. Karaköse</i> 1237
* <i>Salix x rubens</i> Schrank	1340 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Multi., Per., Ph, 18. VII.2016, <i>M. Karaköse</i> 1212
Euphorbiaceae Juss.	
<i>Euphorbia oblongifolia</i> (K. Koch) K. Koch	1615 m, Güllüce village, <i>Picea orientalis</i> forest, Eux., Per., H, 23.VI.2015, <i>M. Karaköse</i> 1004
<i>Euphorbia peplus</i> L. var. <i>minima</i> DC.	1547 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Multi., Ann., Th, 15. IX.2017, <i>M. Karaköse</i> 1245
* <i>Mercurialis perennis</i> L.	1689 m, Akpınar village, mixed forest with <i>Picea orientalis-Pinus sylvestris</i> , Eur-Sib., Per., H, 23.VI.2015, <i>M. Karaköse</i> 1037
Linaceae DC. ex Perleb	
* <i>Linum bienne</i> Mill.	1410 m, Akpınar village, Pasture, Med. Ann., Th, 11.VI.2016, <i>M. Karaköse</i> 1140
<i>Linum unguiculatum</i> P.H. Davis	1316 m, Çakrak village, Pasture, Ir-Tur, Per., H, End (LC), 20.V.2019, <i>M. Karaköse</i> 1452
Order: Geraniales	
Geraniaceae Juss.	
* <i>Erodium acaule</i> (L.) Becherer & Thell.	1785 m, Güllüce village, Forest opening, Med., Per., H, 15.IX.2019, <i>M. Karaköse</i> 1462
* <i>Erodium cicutarium</i> (L.) L Hér. subsp. <i>cicutarium</i>	1604 m, Çakrak village, Road side, Cos., Ann., Th, 14.VII.2019, <i>M. Karaköse</i> 1463
<i>Geranium gracile</i> Ledeb. ex Nordm.	1806 m, Akpınar village, mixed forest with <i>Picea orientalis-Pinus sylvestris</i> , Hyr-Eux, Per., H, 28.VI.2018, <i>M. Karaköse</i> 1323
<i>Geranium pusillum</i> Burm.f.	1050 m, Derindere village, <i>Picea orientalis</i> forest, Multi., Ann., Th, 26.VI.2016, <i>M. Karaköse</i> 1178
* <i>Geranium robertianum</i> L.	1154 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Multi., Ann., Th, 06.VIII.2015, <i>M. Karaköse</i> 1043
* <i>Geranium rotundifolium</i> L.	1510 m, Akpınar village, mixed forest with <i>Pinus sylvestris-Picea orientalis</i> , Multi., Ann., Th, 25.VI.2017, <i>M. Karaköse</i> 1242
<i>Geranium sanguineum</i> L.	1689 m, Akpınar village, mixed forest with <i>Picea orientalis-Pinus sylvestris</i> , Eur-Sib., Per., H, 23.VI.2018, <i>M. Karaköse</i> 1326
<i>Geranium sintenisii</i> Freyn	1579 m, Akpınar village, Forest opening, Eux., Per., H, End (LC), 22.VIII.2016, <i>M. Karaköse</i> 1168
* <i>Geranium tuberosum</i> L.	2057 m, Akpınar village, Pasture, Ir-Tur, Per., G, 11.IX.2019, <i>M. Karaköse</i> 1402
Order: Myrtales	
Lythraceae J.St.-Hil.	
* <i>Lythrum salicaria</i> L.	1327 m, Akpınar village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., H, 14. VII.2018, <i>M. Karaköse</i> 1362
Onagraceae Juss.	
<i>Circaea lutetiana</i> L.	1154 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Multi., Per., H, 06.VIII.2015, <i>M. Karaköse</i> 1128
<i>Epilobium angustifolium</i> L.	1328 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Multi., Per., H, 19. VII.2018, <i>M. Karaköse</i> 1397

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* <i>Epilobium hirsutum</i> L.	1439 m, Güllüce village, mixed forest with <i>Picea orientalis</i> - <i>Pinus sylvestris</i> - <i>Fagus orientalis</i> , Multi., Per., H, 24.VI.2015, <i>M. Karaköse</i> 1071
* <i>Epilobium lanceolatum</i> Sebast. & Mauri	1683 m, Güllüce village, mixed forest with <i>Fagus orientalis</i> - <i>Picea orientalis</i> , Multi., Per., H, 06.VIII.2015, <i>M. Karaköse</i> 1090
<i>Epilobium montanum</i> L.	1444 m, Güllüce village, mixed forest with <i>Picea orientalis</i> - <i>Pinus sylvestris</i> - <i>Fagus orientalis</i> , Eur-Sib., Per., H, 24.VI.2017, <i>M. Karaköse</i> 1258
<i>Epilobium parviflorum</i> Schreb.	1420 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Multi., Per., H, 16.IX.2016, <i>M. Karaköse</i> 1200
<i>Epilobium tetragonum</i> L. subsp. <i>tetragonum</i>	1361 m, Akpınar village, mixed forest with <i>Picea orientalis</i> - <i>Pinus sylvestris</i> , Multi., Per., H, 30.VI.2016, <i>M. Karaköse</i> 1163
<i>Oenothera glazioviana</i> Micheli	892 m, Derindere village, Road side Natr., Per., H, 08.VII.2019, <i>M. Karaköse</i> 1414
Order: Crossosomatales	
Staphyleaceae Martinov	
* <i>Staphylea pinnata</i> L.	1154 m, Güllüce village, mixed forest with <i>Picea orientalis</i> - <i>Fagus orientalis</i> , Multi., Per., H, 06.VIII.2016, <i>M. Karaköse</i> 1127
Order: Sapindales	
Sapindaceae Juss.	
<i>Acer heldreichii</i> Orph. ex Boiss. subsp. <i>trautvetteri</i> (Medw.) A.E. Murray	1490 m, Güllüce village, <i>Fagus orientalis</i> forest, Eux, Per., Ph, 06.IX.2015, <i>M. Karaköse</i> 1044
<i>Acer campestre</i> L. subsp. <i>leiocarpum</i> (Opiz) Schwer.	1693 m, Güllüce village, mixed forest with <i>Picea orientalis</i> - <i>Fagus orientalis</i> , Eur-Sib., Per., Ph, 23.VIII.2017, <i>M. Karaköse</i> 1240
<i>Acer cappadocicum</i> Gleditsch subsp. <i>cappadocicum</i>	1492 m, Güllüce village, <i>Fagus orientalis</i> forest, Hyr-Eux., Per., Ph, 06.IX.2017, <i>M. Karaköse</i> 1246
Order: Malvales	
Malvaceae Juss.	
<i>Tilia rubra</i> DC. subsp. <i>caucasica</i> (Rupr.) V.Engl.	887 m, Derindere village, mixed forest with <i>Picea orientalis</i> - <i>Carpinus betulus</i> , Eux., Per., Ph, 28.VI.2015, <i>M. Karaköse</i> 1087
* <i>Malva sylvestris</i> L.	867 m, Derindere village, Hazelnut orchard, Multi., Per., H, 20.V.2019, <i>M. Karaköse</i> 1453
Thymelaeaceae Juss.	
<i>Daphne pontica</i> L.	1013 m, Derindere village, mixed forest with <i>Fagus orientalis</i> - <i>Carpinus betulus</i> , Eux., Per., Ph, 30.VI.2015, <i>M. Karaköse</i> 1074
<i>Daphne glomerata</i> Lam.	2057 m, Güllüce village, Pasture, Eux., Per., Ph, 11.IX.2019, <i>M. Karaköse</i> 1436
Cistaceae Juss.	
<i>Helianthemum nummularium</i> (L.) Mill. subsp. <i>tomentosum</i> (Scop.) Schinz & Thell.	1222 m, Derindere village, mixed forest with <i>Picea orientalis</i> - <i>Carpinus betulus</i> , Multi., Per., Ch, 29.VI.2016, <i>M. Karaköse</i> 1146
Order: Brassicales	
Brassicaceae Burnett	
* <i>Alliaria petiolata</i> (M. Bieb.) Cavara & Grande	1050 m, Derindere village, <i>Picea orientalis</i> forest, Multi., Bia., H, 26.VI.2018, <i>M. Karaköse</i> 1309
<i>Alyssum trichostachyum</i> Rupr.	2057 m, Güllüce village, Pasture, Multi., Per., H, 11.IX.2018, <i>M. Karaköse</i> 1356
<i>Arabis turrita</i> L.	910 m, Derindere village, <i>Picea orientalis</i> forest, Multi., Per., H, 26.VI.2019, <i>M. Karaköse</i> 1438
<i>Barbarea vulgaris</i> R. Br. subsp. <i>vulgaris</i>	1580 m, Akpınar village, mixed forest with <i>Fagus orientalis</i> - <i>Picea orientalis</i> , Multi., Bia., H, 30.VI.2015, <i>M. Karaköse</i> 1012
<i>Brassica oleracea</i> L.	867 m, Derindere village, Hazelnut orchard, Cult., Per., H, 20.V.2019, <i>M. Karaköse</i> 1442

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Appendix (Continued)

<i>Bunias orientalis</i> L.	1693 m, Akpınar village, Pasture, Multi., Per., H, 17.V.2018, <i>M. Karaköse</i> 1317
<i>Capsella bursa-pastoris</i> (L.) Medik.	1340 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Cos., Ann., Th, 18. VII.2016, <i>M. Karaköse</i> 1197
<i>Cardamine bulbifera</i> (L.) Crantz	1750 m, Akpınar village, mixed forest with <i>Fagus orientalis-Picea orientalis</i> , Eur-Sib., Per., G, 20.VIII.2015, <i>M. Karaköse</i> 1042
<i>Cardamine impatiens</i> L. subsp. <i>impatiens</i>	1328 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Ann., Th, 19. VII.2016, <i>M. Karaköse</i> 1213
<i>Cardamine impatiens</i> L. subsp. <i>pectinata</i> (Pall. ex DC.) Stoj. & Stef.	1784 m, Güllüce village, <i>Picea orientalis</i> forest, Eur-Sib., Ann., Th, 23.VI.2015, <i>M. Karaköse</i> 984
* <i>Cardamine quinquefolia</i> (M. Bieb.) Schmalh.	1735 m, Güllüce village, <i>Fagus orientalis</i> forest, Eur-Sib., Per., H, 23.V.2018, <i>M. Karaköse</i> 1359
<i>Cardamine raphanifolia</i> Pourr. subsp. <i>acris</i> (Griseb.) O.E. Schulz	1223 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., H, 15. IX.2017, <i>M. Karaköse</i> 1257
<i>Cardamine uliginosa</i> M. Bieb.	890 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Hyr-Eux, Per., G, 09. IX.2018, <i>M. Karaköse</i> 1388
<i>Draba hispida</i> Willd.	1693 m, Çakrak village, Pasture, Eux., Per., H, 17.V.2019, <i>M. Karaköse</i> 1426
<i>Erysimum cuspidatum</i> (M. Bieb.) DC.	1132 m, Derindere village, Road side, Multi., Ann., Th, 25.VIII.2019, <i>M. Karaköse</i> 1433
<i>Erysimum pulchellum</i> (Willd.) J. Gay subsp. <i>pulchellum</i>	1730 m, Çakrak village, Pasture, Multi., Per., H, 23.V.2018, <i>M. Karaköse</i> 1344
<i>Hesperis matronalis</i> L. subsp. <i>matronalis</i>	1729 m, Çakrak village, Pasture, Multi., Bia., H, 23.V.2017, <i>M. Karaköse</i> 1270
* <i>Lepidium virginicum</i> L.	1689 m, Akpınar village, mixed forest with <i>Picea orientalis-Pinus sylvestris</i> , Inv., Ann., Th, 23.VI.2018, <i>M. Karaköse</i> 1379
<i>Nasturtium officinale</i> R. Br.	1154 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Multi., Per., G, 06.VIII.2015, <i>M. Karaköse</i> 1085
* <i>Rorippa sylvestris</i> (L.) Besser subsp. <i>sylvestris</i>	1604 m, Çakrak village, Road side, Multi., Per., G, 14.VII.2019, <i>M. Karaköse</i> 1409
<i>Thlaspi perfoliatum</i> L.	1689 m, Akpınar village, mixed forest with <i>Picea orientalis-Pinus sylvestris</i> , Multi., Ann., Th, 23.VI.2015, <i>M. Karaköse</i> 1011
<i>Sinapis arvensis</i> L.	871 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Multi., Ann., Th, 14. IX.2017, <i>M. Karaköse</i> 1296
* <i>Sisymbrium loeselii</i> L.	1132 m, Derindere village, Road side, Multi., Ann., Th, 25.VIII.2019, <i>M. Karaköse</i> 1434
Clade: SUPERASTERIDS	
Order: Santalales	
Santalaceae R. Br.	
* <i>Thesium billardieri</i> Boiss.	963 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Ir-Tur, Bia., H, 29.VI.2016, <i>M. Karaköse</i> 1174
Order: Caryophyllales	
Polygonaceae Juss.	
<i>Persicaria lapathifolia</i> (L.) Delarbre	1328 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Multi., Ann., Th, 19. VII.2017, <i>M. Karaköse</i> 1214
<i>Polygonum carneum</i> C. Koch	1510 m, Akpınar village, mixed forest with <i>Pinus sylvestris-Picea orientalis</i> , Eux., Per., H, 30.VI.2016, <i>M. Karaköse</i> 1166
<i>Rumex acetosella</i> L.	1510 m, Akpınar village, mixed forest with <i>Pinus sylvestris-Picea orientalis</i> , Cos., Per., H, 25.VI.2015, <i>M. Karaköse</i> 1086
<i>Rumex crispus</i> L.	1328 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Multi., Per., H, 19. VII.2017, <i>M. Karaköse</i> 1215
<i>Rumex obtusifolius</i> L. subsp. <i>subalpinus</i> (Schur) Celak.	1420 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Multi., Per., H, 16. IX.2016, <i>M. Karaköse</i> 1198
Caryophyllaceae Juss.	
<i>Cerastium cerastoides</i> (L.) Britton	2057 m, Güllüce village, Pasture, Multi., Per., H, 11.IX.2018, <i>M. Karaköse</i> 1347

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Appendix (Continued)

<i>Dianthus carmelitarum</i> Reut. ex Boiss.	1013 m, Derindere village, mixed forest with <i>Fagus orientalis-Carpinus betulus</i> , Eur-Sib., Per., H, End (LC), 30.VI.2015, <i>M. Karaköse</i> 1107
* <i>Dianthus carthusianorum</i> L.	1132 m, Derindere village, Road side, Multi., Per., H, 25.VIII.2018, <i>M. Karaköse</i> 1313
<i>Gypsophila silenoides</i> Rupr.	1504 m, Çakrak village, <i>Pinus sylvestris</i> forest, Eux., Per., H, 15.IX.2017, <i>M. Karaköse</i> 1261
* <i>Moehringia trinervia</i> (L.) Clairv.	1462 m, Akpınar village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Multi., Ann., Th, 25.VI.2015, <i>M. Karaköse</i> 1102
<i>Petrohragia saxifraga</i> (L.) Link	1013 m, Derindere village, mixed forest with <i>Fagus orientalis-Carpinus betulus</i> , Eur-Sib., Per., H, 30.VI.2015, <i>M. Karaköse</i> 1108
* <i>Scleranthus annuus</i> L. subsp. <i>annuus</i>	2057 m, Güllüce village, Pasture, Multi., Ann., Th, 11.IX.2019, <i>M. Karaköse</i> 1410
<i>Silene compacta</i> Fisch.	1301 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Multi., Bia., H, 24.VI.2016, <i>M. Karaköse</i> 1188
<i>Silene dichotoma</i> Ehrh. subsp. <i>dichotoma</i>	1785 m, Güllüce village, Forest opening, Multi., Ann., Th, 30.VI.2016, <i>M. Karaköse</i> 1162
<i>Silene italica</i> (L.) Pers.	1570 m, Çakrak village, mixed forest with <i>Pinus sylvestris-Picea orientalis</i> , 22.VIII.2016, <i>M. Karaköse</i> 1162
<i>Silene latifolia</i> Poir. subsp. <i>eriocalycinae</i> (Boiss.) Greuter & Burdet	1515 m, Akpınar village, mixed forest with <i>Pinus sylvestris-Picea orientalis</i> , Multi., Ann., Th, 25.VI.2015, <i>M. Karaköse</i> 986
<i>Silene lazica</i> Boiss.	1917 m, Akpınar village, <i>Picea orientalis</i> forest, Eux., Per., H, End (LC), 22.VIII.2016, <i>M. Karaköse</i> 1192
<i>Silene montbretiana</i> Boiss.	1636 m, Akpınar village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Ir-Tur., Per., H, 28.VI.2016, <i>M. Karaköse</i> 1191
<i>Silene vulgaris</i> (Moench) Garcke var. <i>vulgaris</i>	1524 m, Akpınar village, Forest opening, Multi., Per., H, 14.VII.2018, <i>M. Karaköse</i> 1363
<i>Stellaria holostea</i> L.	1693 m, Güllüce village, mixed forest with <i>Fagus orientalis-Picea orientalis</i> , Eur-Sib., Per., H, 27.VI.2015, <i>M. Karaköse</i> 1013
<i>Stellaria media</i> (L.) Vill.	1327 m, Akpınar village, Riparian side with <i>Alnus glutinosa</i> , Multi., Ann., Th, 14.VII.2018, <i>M. Karaköse</i> 1353
Amaranthaceae Juss.	
<i>Chenopodium album</i> L. subsp. <i>album</i>	1547 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Multi., Ann., Th, 15.IX.2017, <i>M. Karaköse</i> 1247
<i>Amaranthus retroflexus</i> L.	871 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Inv., Ann., Th, 14.IX.2017, <i>M. Karaköse</i> 1297
<i>Beta corolliflora</i> Zosimovic ex Buttler	1592 m, Güllüce village, Road side, Ir-Tur., Per., H, 25.VIII.2018, <i>M. Karaköse</i> 1311
<i>Chenopodium foliosum</i> Asch.	892 m, Derindere village, Road side, Multi., Ann., Th, 08.VII.2019, <i>M. Karaköse</i> 1417
Phytolaccaceae R. Br.	
<i>Phytolacca americana</i> L.	825 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Natr., Per., H, 14.IX.2017, <i>M. Karaköse</i> 1289
Clade: ASTERIDS	
Order: Cornales	
Cornaceae Bercht. & J.Presl	
<i>Cornus sanguinea</i> L. subsp. <i>australis</i> (C.A. Mey.) Jáv.	1509 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., Ph, 07.IX.2019, <i>M. Karaköse</i> 1458
Order: Ericales	
Balsaminaceae A. Rich.	
<i>Impatiens noli-tangere</i> L.	1340 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Ann., Th, 18.VII.2016, <i>M. Karaköse</i> 1199
Primulaceae Batsch ex Borkh.	

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Appendix (Continued)

<i>Cyclamen coum</i> Mill. subsp. <i>coum</i>	963 m, Derindere village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Multi., Per., G, 26.VI.2015, <i>M. Karaköse</i> 998
<i>Cyclamen parviflorum</i> Pobed.	1441 m, Güllüce village, mixed forest with <i>Picea orientalis-Pinus sylvestris-Fagus orientalis</i> , Eux., Per., G, End (LC), 24.VI.2018, <i>M. Karaköse</i> 1406
<i>Lysimachia punctata</i> L.	1340 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Hyr-Eux., Per., G, 18.VII.2016, <i>M. Karaköse</i> 1190
<i>Primula vulgaris</i> Huds. subsp. <i>vulgaris</i>	1314 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., H, 15.IX.2016, <i>M. Karaköse</i> 1154
<i>Primula vulgaris</i> Huds. subsp. <i>rubra</i> (Sm.) Arcang.	1222 m, Derindere village, mixed forest with <i>Picea orientalis-Carpinus betulus</i> , Eux., Per., H, 29.VI.2016, <i>M. Karaköse</i> 1159
<i>Primula veris</i> L. subsp. <i>suaveolens</i> (Bertol.) Gutermann & Ehrend.	1991 m, Akpınar village, <i>Pinus sylvestris</i> forest, Eur-Sib., Per., H, 22.VIII.2015, <i>M. Karaköse</i> 1030
Ericaceae Juss.	
* <i>Monotropa hypopitys</i> L.	1820 m, Akpınar village, <i>Picea orientalis</i> forest, Multi., Per., G, 05.VIII.2016, <i>M. Karaköse</i> 1123
<i>Pyrola media</i> Sw.	1441 m, Güllüce village, mixed forest with <i>Picea orientalis-Pinus sylvestris-Fagus orientalis</i> , Eur-Sib., Per., H, 24.VI.2015, <i>M. Karaköse</i> 1073
<i>Rhododendron luteum</i> Sweet	1844 m, Akpınar village, <i>Picea orientalis</i> forest, Eux., Per., Ph, 06.VII.2016, <i>M. Karaköse</i> 1122
<i>Rhododendron ponticum</i> L.	1154 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Eux., Per., Ph, 06.VIII.2015, <i>M. Karaköse</i> 1053
<i>Vaccinium arctostaphylos</i> L.	1458 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Eux., Per., Ph, 25.VI.2015, <i>M. Karaköse</i> 1092
<i>Vaccinium myrtillus</i> L.	2027 m, Güllüce village, <i>Pinus sylvestris</i> forest, Eur-Sib., Per., Ph, 19.IX.2017, <i>M. Karaköse</i> 1219
Order: Gentianales	
Rubiaceae Juss.	
<i>Asperula involucrata</i> Wahlenb.	1750 m, Akpınar village, mixed forest with <i>Fagus orientalis-Picea orientalis</i> , Eux., Per., H, 20.VIII.2019, <i>M. Karaköse</i> 1421
<i>Asperula taurina</i> L.	1547 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Hyr-Eux., Per., H, 15.VI.2015, <i>M. Karaköse</i> 1061
<i>Cruciata taurica</i> (Pall. ex Willd.) Ehrend.	892 m, Derindere village, Road side, Ir-Tur., Per., Ch, 08.VII.2019, <i>M. Karaköse</i> 1418
<i>Galium aparine</i> L.	1689 m, Akpınar village, mixed forest with <i>Picea orientalis-Pinus sylvestris</i> , Multi., Ann., Th, 23.VI.2015, <i>M. Karaköse</i> 1077
<i>Galium fissurense</i> Ehrend. & Schönb.-Tem.	825 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Eux., Per., H, End (LC), 14.IX.2017, <i>M. Karaköse</i> 1287
<i>Galium odoratum</i> (L.) Scop.	1786 m, Akpınar village, <i>Picea orientalis</i> forest, Eur-Sib., Per., H, 23.VI.2015, <i>M. Karaköse</i> 1006
<i>Galium palustre</i> L.	1638 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Eur-Sib., Per., H, 28.VI.2015, <i>M. Karaköse</i> 1038
<i>Galium rotundifolium</i> L.	1786 m, Güllüce village, <i>Picea orientalis</i> forest, Eur-Sib., Per., H, 23.VI.2015, <i>M. Karaköse</i> 1005
<i>Galium verum</i> L. subsp. <i>verum</i>	1991 m, Akpınar village, <i>Pinus sylvestris</i> forest, Eur-Sib., Per., H, 22.VIII.2017, <i>M. Karaköse</i> 1225
<i>Sherardia arvensis</i> L.	1220 m, Derindere village, Road side, Med., Ann., Th, 23.VI.2016, <i>M. Karaköse</i> 1156
Gentianaceae Juss.	
<i>Gentiana asclepiadea</i> L.	1621 m, Güllüce village, <i>Fagus orientalis</i> forest, Eur-Sib., Per., H, 23.VI.2015, <i>M. Karaköse</i> 1054
<i>Gentiana pyrenaica</i> L.	2057 m, Akpınar village, Pasture, Eur-Sib., Per., H, 11.IX.2019, <i>M. Karaköse</i> 1401

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Appendix (Continued)

<i>Gentianella caucasea</i> (Lodd. ex Sims) Holub	2057 m, Güllüce village, Pasture, Eux., Bia., H, 11.IX.2019, <i>M. Karaköse</i> 1435
Order: Boraginales	
Boraginaceae Juss.	
<i>Cerinth minor</i> L. subsp. <i>auriculata</i> (Ten.) Domac	1689 m, Akpınar village, mixed forest with <i>Picea orientalis</i> - <i>Pinus sylvestris</i> , Multi., Bia., H, 23.VI.2018, <i>M. Karaköse</i> 1352
<i>Echium plantagineum</i> L.	825 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Med., Ann., Th, 14. IX.2017, <i>M. Karaköse</i> 1292
<i>Echium vulgare</i> L. subsp. <i>vulgare</i>	1222 m, Derindere village, mixed forest with <i>Picea orientalis</i> - <i>Carpinus betulus</i> , Eur-Sib., Bia., H, 29.VI.2016, <i>M. Karaköse</i> 1155
<i>Myosotis laxa</i> Lehm. subsp. <i>caespitosa</i> (Schultz) Hyl. ex. Nordh.	1252 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Multi., Ann., Th, 14. IX.2017, <i>M. Karaköse</i> 1291
<i>Myosotis lazica</i> Popov	1697 m, Güllüce village, Pasture, Eux., Ann., Th, End (NT), 17.V.2018, <i>M. Karaköse</i> 1372
<i>Myosotis lithospermifolia</i> (Willd.) Hornem.	1786 m, Güllüce village, <i>Picea orientalis</i> forest, Multi., Per., H, 23.VI.2015, <i>M. Karaköse</i> 999
<i>Myosotis olympica</i> Boiss.	1509 m, Çakrak village, mixed forest with <i>Pinus sylvestris</i> - <i>Picea orientalis</i> , Eux., Per., H, 30.VI.2016, <i>M. Karaköse</i> 1172
<i>Onosma roussaei</i> DC.	1632 m, Çakrak village, Forest opening, Ir-Tur., Per., H, 07.VI.2018, <i>M. Karaköse</i> 1391
<i>Symphytum asperum</i> Lepech.	1678 m, Güllüce village, <i>Picea orientalis</i> forest, Hyr-Eux., Per., G, 23.VI.2015, <i>M. Karaköse</i> 1055
<i>Symphytum sylvaticum</i> Boiss.	1420 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eux., Per., G, End (EN), 16.IX.2016, <i>M. Karaköse</i> 1205
<i>Trachystemon orientalis</i> (L.) D. Don	1820 m, Akpınar village, <i>Picea orientalis</i> forest, Eux., Per., H, 05.VIII.2015, <i>M. Karaköse</i> 1000
Order: Solanales	
Convolvulaceae Juss.	
<i>Calystegia silvatica</i> (Kit.) Griseb.	1154 m, Güllüce village, mixed forest with <i>Picea orientalis</i> - <i>Fagus orientalis</i> , Multi., Per., G, 06.VIII.2016, <i>M. Karaköse</i> 1134
<i>Convolvulus arvensis</i> L.	1340 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Cos., Per., G, 18.VII.2016, <i>M. Karaköse</i> 1204
* <i>Convolvulus cantabrica</i> L.	890 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Med., Per., Ch, 09. IX.2018, <i>M. Karaköse</i> 1332
Solanaceae Juss.	
<i>Alkekengi officinarum</i> Moench	1120 m, Derindere village, mixed forest with <i>Fagus orientalis</i> - <i>Picea orientalis</i> - <i>Carpinus betulus</i> , Multi., Per., H, 26.VI.2015, <i>M. Karaköse</i> 1099
<i>Atropa bella-donna</i> L.	1154 m, Güllüce village, mixed forest with <i>Picea orientalis</i> - <i>Fagus orientalis</i> , Eur-Sib., Per., H, 06.VIII.2016, <i>M. Karaköse</i> 1135
* <i>Solanum americanum</i> Mill.	871 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Cos., Ann., Th, 14. IX.2017, <i>M. Karaköse</i> 1295
<i>Solanum dulcamara</i> L.	892 m, Derindere village, Road side, Eur-Sib., Per., H, 08.VII.2019, <i>M. Karaköse</i> 1413
Order: Lamiales	
Plantaginaceae Juss.	
<i>Digitalis ferruginea</i> L. subsp. <i>schischkinii</i> (Ivanina) Werner	1460 m, Güllüce village, mixed forest with <i>Picea orientalis</i> - <i>Fagus orientalis</i> , Eur-Sib., Per., H, 25.VI.2015, <i>M. Karaköse</i> 1001
<i>Digitalis lamarckii</i> Ivanina	1661 m, Akpınar village, mixed forest with <i>Pinus sylvestris</i> - <i>Picea orientalis</i> , Ir-Tur., Per., H, End (LC), 12.VII.2017, <i>M. Karaköse</i> 1224
<i>Plantago lanceolata</i> L.	1689 m, Akpınar village, mixed forest with <i>Picea orientalis</i> - <i>Pinus sylvestris</i> , Multi., Per., H, 23.VI.2015, <i>M. Karaköse</i> 1036

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Appendix (Continued)

<i>Plantago major</i> L. subsp. <i>major</i>	1328 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Multi., Per., H, 19. VII.2017, <i>M. Karaköse</i> 1210
<i>Veronica anagallis-aquatica</i> L.	1676 m, Güllüce village, <i>Picea orientalis</i> forest, Multi., Per., H, 23.VI.2015, <i>M. Karaköse</i> 1056
<i>Veronica beccabunga</i> L. subsp. <i>beccabunga</i>	871 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Multi., Per., G, 14. IX.2017, <i>M. Karaköse</i> 1243
* <i>Veronica chamaedrys</i> L.	1301 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Eur-Sib., Per., G, 24.VI.2015, <i>M. Karaköse</i> 1002
* <i>Veronica cymbalaria</i> Bodard	1327 m, Akpınar village, Riparian side with <i>Alnus glutinosa</i> , Med., Ann., Th, 14. VII.2018, <i>M. Karaköse</i> 1355
<i>Veronica filiformis</i> Sm.	1301 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Hyr-Eux., Per., H, 24.VI.2016, <i>M. Karaköse</i> 1185
<i>Veronica gentianoides</i> Vahl subsp. <i>gentianoides</i>	1327 m, Akpınar village, Riparian side with <i>Alnus glutinosa</i> , Hyr-Eux., Per., H, 14. VII.2018, <i>M. Karaköse</i> 1366
<i>Veronica magna</i> M.A. Fisch.	890 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Eux., Per., H, 09. IX.2017, <i>M. Karaköse</i> 1283
<i>Veronica multifida</i> L.	1755 m, Güllüce village, Forest opening, Ir-Tur., Per., Ch, 15.IX.2018, <i>M. Karaköse</i> 1384
<i>Veronica peduncularis</i> M.Bieb.	1821 m, Akpınar village, mixed forest with <i>Picea orientalis-Pinus sylvestris</i> , Eux., Per., H, 22.VIII.2016, <i>M. Karaköse</i> 1196
<i>Veronica persica</i> Poir.	1527 m, Güllüce village, Forest opening, Multi., Ann., Th, 19.IV.2018, <i>M. Karaköse</i> 1349
<i>Veronica serpyllifolia</i> L.	867 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Multi., Per., H, 14. IX.2016, <i>M. Karaköse</i> 1125
Scrophulariaceae Juss.	
* <i>Scrophularia chrysantha</i> Jaub. & Spach	1126 m, Derindere village, <i>Carpinus betulus</i> forest, Eux., Per., H, 25.VIII.2019, <i>M. Karaköse</i> 1429
* <i>Scrophularia kotschyana</i> Benth.	1036 m, Derindere village, <i>Carpinus betulus</i> forest, Multi., Per., H, 20.VIII.2019, <i>M. Karaköse</i> 1440
<i>Scrophularia nodosa</i> L.	1683 m, Güllüce village, mixed forest with <i>Fagus orientalis-Picea orientalis</i> , Eur-Sib., Per., H, 16.VII.201, <i>M. Karaköse</i> 1241
<i>Scrophularia scopolii</i> Hoppe ex Pers. var. <i>adenocalyx</i> Sommier & Levier	1314 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eux., Bia., H, 15.IX.2016, <i>M. Karaköse</i> 1124
<i>Scrophularia umbrosa</i> Dumort.	1605 m, Akpınar village, <i>Pinus sylvestris</i> forest, Eur-Sib., Per., H, 22.VIII.2017, <i>M. Karaköse</i> 1230
<i>Verbascum armenum</i> Boiss. & Kotschy ex Boiss. var. <i>tempkyanum</i> (Freyn & Sint.) Murb.	1504 m, Çakrak village, <i>Pinus sylvestris</i> forest, Ir-Tur., Per., H, End (LC), 15.VIII.2018, <i>M. Karaköse</i> 1321
<i>Verbascum cheiranthifolium</i> Boiss. var. <i>cheiranthifolium</i>	1605 m, Akpınar village, <i>Pinus sylvestris</i> forest, Multi., Bia., H, 22.VIII.2017, <i>M. Karaköse</i> 1229
<i>Verbascum salgirensis</i> Soldano	1689 m, Akpınar village, mixed forest with <i>Picea orientalis-Pinus sylvestris</i> , Eux., Per., H, 23.VI.2015, <i>M. Karaköse</i> 1031
Verbenaceae J.St.Hil.	
<i>Verbena officinalis</i> L.	892 m, Derindere village, Road side, Multi., Per., H, 08.VII.2019, <i>M. Karaköse</i> 1411
Lamiaceae Martinov	
<i>Ajuga orientalis</i> L.	1807 m, Güllüce village, mixed forest with <i>Picea orientalis-Pinus sylvestris</i> , Multi., Per., H, 12.VII.2018, <i>M. Karaköse</i> 1341
* <i>Ajuga reptans</i> L.	1525 m, Çakrak village, Forest opening, Eur-Sib., Per., H, 19.IV.2018, <i>M. Karaköse</i> 1322
<i>Clinopodium grandiflorum</i> (L.) Kuntze	1638 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Eur-Sib., Per., H, 28.VI.2015, <i>M. Karaköse</i> 1034

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Appendix (Continued)

<i>Clinopodium menthifolium</i> (Host) Stace subsp. <i>menthifolium</i>	1420 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., H, 16. IX.2015, <i>M. Karaköse</i> 1181
<i>Clinopodium vulgare</i> L. subsp. <i>arundanum</i> (Boiss.) Nyman	1515 m, Akpınar village, mixed forest with <i>Pinus sylvestris</i> - <i>Picea orientalis</i> , Multi., Per., H, 25.VI.2015, <i>M. Karaköse</i> 1003
<i>Galeopsis bifida</i> Boenn.	1340 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Ann., Th, 18. VII.2017, <i>M. Karaköse</i> 1207
<i>Lamium album</i> L. subsp. <i>album</i>	1625 m, Çakrak village, Pasture, Eur-Sib., Per., H, 10.IV.2018, <i>M. Karaköse</i> 1346
* <i>Lamium amplexicaule</i> L. var. <i>amplexicaule</i>	1625 m, Çakrak village, Road side, Eur-Sib., Ann., Th, 12.IV.2018, <i>M. Karaköse</i> 1348
* <i>Lamium galeobdolon</i> (L.) L. subsp. <i>galeobdolon</i>	1676 m, Güllüce village, <i>Picea orientalis</i> forest, Eur-Sib., Per., H, 23.VI.2015, <i>M. Karaköse</i> 1057
<i>Lamium maculatum</i> (L.) L.	1340 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., H, 18. VII.2017, <i>M. Karaköse</i> 1206
* <i>Lamium moschatum</i> Mill. subsp. <i>moschatum</i>	1625 m, Güllüce village, Road side, E. Med., Ann., Th, 12.IV.2019, <i>M. Karaköse</i> 1443
* <i>Lamium purpureum</i> L. var. <i>purpureum</i>	890 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Ann., Th, 09. IX.2018, <i>M. Karaköse</i> 1350
* <i>Lycopus europaeus</i> L.	890 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., H, 14. VIII.2019, <i>M. Karaköse</i> 1403
<i>Melissa officinalis</i> L. subsp. <i>officinalis</i>	1505 m, Çakrak village, Riparian side with <i>Alnus glutinosa</i> , Eux., Per., H, 07.IX.2017, <i>M. Karaköse</i> 1271
<i>Mentha longifolia</i> (L.) L. subsp. <i>longifolia</i>	1420 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eux., Per., H, 11.VII.2017, <i>M. Karaköse</i> 1208
<i>Mentha pulegium</i> L.	1512 m, Akpınar village, Riparian side with <i>Alnus glutinosa</i> , Multi., Per., H, 21. VIII.2017, <i>M. Karaköse</i> 1248
<i>Mentha spicata</i> L.	1735 m, Güllüce village, Orchard, Multi., Per., H, 15.IX.2018, <i>M. Karaköse</i> 1364
<i>Nepeta nuda</i> L. subsp. <i>albiflora</i> (Boiss.) Gams	1689 m, Akpınar village, mixed forest with <i>Picea orientalis</i> - <i>Pinus sylvestris</i> , Multi., Per., H, 11.VI.2018, <i>M. Karaköse</i> 1318
<i>Origanum vulgare</i> L. subsp. <i>viridulum</i> (Martrin-Donos) Nyman	1820 m, Akpınar village, <i>Picea orientalis</i> forest, Multi., Per., H, 05.VIII.2015, <i>M. Karaköse</i> 1058
<i>Prunella vulgaris</i> L.	1659 m, Akpınar village, mixed forest with <i>Fagus orientalis</i> - <i>Carpinus betulus</i> , Eur-Sib., Per., H, 02.IX.2016, <i>M. Karaköse</i> 1118
<i>Salvia forskahlei</i> L.	1689 m, Akpınar village, mixed forest with <i>Picea orientalis</i> - <i>Pinus sylvestris</i> , Eur-Sib., Per., H, 23.VI.2015, <i>M. Karaköse</i> 1035
<i>Salvia glutinosa</i> L.	1750 m, Güllüce village, mixed forest with <i>Fagus orientalis</i> - <i>Picea orientalis</i> , Eur-Sib., Per., H, 16.VIII.2016, <i>M. Karaköse</i> 1136
<i>Salvia verticillata</i> L. subsp. <i>verticillata</i>	1340 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., H, 24. VII.2017, <i>M. Karaköse</i> 1209
* <i>Scutellaria albida</i> L. subsp. <i>colchica</i> (Rech.f.) J.R.Edm.	910 m, Derindere village, <i>Picea orientalis</i> forest, Eux., Per., H, 26.VI.2015, <i>M. Karaköse</i> 1093
<i>Stachys annua</i> (L.) L. subsp. <i>annua</i>	1515 m, Akpınar village, mixed forest with <i>Pinus sylvestris</i> - <i>Picea orientalis</i> , Multi., Per., H, 06.VI.2015, <i>M. Karaköse</i> 1033
<i>Stachys iberica</i> M.Bieb. subsp. <i>stenostachya</i> (Boiss.) Rech.f.	1524 m, Akpınar village, Forest opening, Ir-Tur., Per., H, 14.VII.2018, <i>M. Karaköse</i> 1365
<i>Stachys macrantha</i> (K.Koch) Stearn	1327 m, Akpınar village, Riparian side with <i>Alnus glutinosa</i> , Eux., Per., H, 14.VII.2018, <i>M. Karaköse</i> 1361
<i>Stachys sylvatica</i> L.	1328 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., H, 13. VII.2017, <i>M. Karaköse</i> 1217
<i>Teucrium chamaedrys</i> L. subsp. <i>chamaedrys</i>	1991 m, Akpınar village, <i>Pinus sylvestris</i> forest, Multi., Per., H, 24.VII.2015, <i>M. Karaköse</i> 1032
* <i>Thymus fallax</i> Fisch. & C.A.Mey.	1651 m, Derindere village, Pasture, Ir-Tur., Per., Ch, 07.VI.2018, <i>M. Karaköse</i> 1375

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Appendix (Continued)

<i>Thymus praecox</i> Opiz subsp. <i>grossheimii</i> (Ronniger) Jalas	1771 m, Güllüce village, Forest opening, Eux., Per., Ch, 15.IX.2018, <i>M. Karaköse</i> 1381
Orobanchaceae Vent.	
<i>Euphrasia hirtella</i> Jord. ex Reut.	1327 m, Akpınar village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Ann., Th, 21.VII.2019, <i>M. Karaköse</i> 1399
<i>Euphrasia pectinata</i> Ten.	1050 m, Derindere village, <i>Picea orientalis</i> forest, Eur-Sib., Ann., Th, 02.VI.2016, <i>M. Karaköse</i> 1180
<i>Melampyrum elatius</i> Reut. ex Boiss.	1013 m, Derindere village, mixed forest with <i>Fagus orientalis-Carpinus betulus</i> , Eux., Ann., Th, End (NT), 22.VI.2016, <i>M. Karaköse</i> 1117
<i>Orobanche alba</i> Stephan ex Willd. subsp. <i>alba</i>	1785 m, Güllüce village, Forest opening, Multi., Ann., VP, 18.IX.2016, <i>M. Karaköse</i> 1164
<i>Orobanche lutea</i> Baumg.	1592 m, Güllüce village, Road side, Multi., Ann., VP, 25.VIII.2017, <i>M. Karaköse</i> 1249
* <i>Orobanche nana</i> (Reut.) Beck	1492 m, Güllüce village, <i>Fagus orientalis</i> forest, Multi., Ann., VP, 06.IX.2018, <i>M. Karaköse</i> 1369
<i>Pedicularis condensata</i> M.Bieb.	1327 m, Akpınar village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., H, 14.VII.2018, <i>M. Karaköse</i> 1315
<i>Rhynchosorys stricta</i> Albov	1659 m, Akpınar village, mixed forest with <i>Fagus orientalis-Carpinus betulus</i> , Eux., Ann., Th, 07.IX.2017, <i>M. Karaköse</i> 1256
Order: Aquifoliales	
Aquifoliaceae Bercht. & J.Presl	
<i>Ilex colchica</i> Pojark.	1510 m, Güllüce village, <i>Picea orientalis</i> forest, Eux., Per., Ph, 13.VII.2016, <i>M. Karaköse</i> 1186
Order: Asterales	
Campanulaceae Juss.	
<i>Asyneuma rigidum</i> (Willd.) Grossh. subsp. <i>rigidum</i>	2057 m, Akpınar village, Pasture, Ir-Tur., Per., H, 11.IX.2019, <i>M. Karaköse</i> 1398
<i>Campanula alliariifolia</i> Willd.	963 m, Derindere village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Eux., Per., H, 26.VI.2015, <i>M. Karaköse</i> 1091
<i>Campanula collina</i> Sims	1132 m, Derindere village, Road side, Eux., Per., H, 21.VIII.2018, <i>M. Karaköse</i> 1312
<i>Campanula grandis</i> Fisch. & C.A.Mey. subsp. <i>grandis</i> Fisch. & C.A.Mey.	1547 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eux., Per., H, End (LC), 15.IX.2017, <i>M. Karaköse</i> 1306
<i>Campanula lactiflora</i> M.Bieb.	1154 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Eux., Per., H, 12.VIII.2017, <i>M. Karaköse</i> 1236
<i>Campanula latifolia</i> L.	1510 m, Akpınar village, mixed forest with <i>Pinus sylvestris-Picea orientalis</i> , Eur-Sib., Per., H, 25.VI.2016, <i>M. Karaköse</i> 1116
<i>Campanula olympica</i> Boiss.	1524 m, Akpınar village, Forest opening, Eux., Per., H, 14.VII.2018, <i>M. Karaköse</i> 1371
<i>Campanula rapunculoides</i> L.	1515 m, Akpınar village, mixed forest with <i>Pinus sylvestris-Picea orientalis</i> , Eur-Sib., Per., H, 25.VI.2016, <i>M. Karaköse</i> 1184
<i>Campanula rapunculus</i> L. subsp. <i>lambertiana</i> (A.DC.) Rech.f.	1615 m, Güllüce village, mixed forest with <i>Fagus orientalis-Picea orientalis</i> , Eur-Sib., Bia., H, 17.VIII.2015, <i>M. Karaköse</i> 1072
Asteraceae Bercht. & J.Presl	
<i>Achillea biserrata</i> M.Bieb.	1340 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eux., Per., H, 18.VII.2016, <i>M. Karaköse</i> 1201
<i>Achillea kotschyi</i> Boiss. subsp. <i>kotschyi</i>	1132 m, Derindere village, Road side, Multi., Per., H, 15.VIII.2018, <i>M. Karaköse</i> 1314
<i>Achillea millefolium</i> L. subsp. <i>millefolium</i>	1222 m, Derindere village, mixed forest with <i>Picea orientalis-Carpinus betulus</i> , Eur-Sib., Per., H, 17.VI.2016, <i>M. Karaköse</i> 1153
<i>Achillea setacea</i> Waldst. & Kit.	1592 m, Güllüce village, Road side, Eur-Sib., Per., H, 10.VII.2018, <i>M. Karaköse</i> 1333

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Appendix (Continued)

<i>Anthemis cretica</i> L. subsp. <i>cassia</i> (Boiss.) Grierson	1605 m, Akpınar village, <i>Pinus sylvestris</i> forest, Multi., Per., H, 21.VIII.2016, <i>M. Karaköse</i> 1170
<i>Anthemis marschalliana</i> Willd. subsp. <i>pectinata</i> (Boiss.) Grierson	892 m, Derindere village, Road side, Eux., Per., H, 10.VII.2019, <i>M. Karaköse</i> 1416
<i>Arctium minus</i> (Hill) Bernh.	1340 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., H, 18.VII.2016, <i>M. Karaköse</i> 1202
* <i>Artemisia absinthium</i> L.	1771 m, Güllüce village, Forest opening, Inv., Per., Ch, 11.IX.2019, <i>M. Karaköse</i> 1428
<i>Artemisia vulgaris</i> L.	1604 m, Çakrak village, Riparian side with <i>Alnus glutinosa</i> , Multi., Per., H, 14.VII.2019, <i>M. Karaköse</i> 1405
* <i>Aster subulatus</i> (Michx.) Hort. ex Michx.	892 m, Derindere village, Road side, Inv., Ann., Th, 08.VIII.2019, <i>M. Karaköse</i> 1437
<i>Bellis perennis</i> L.	1527 m, Güllüce village, Forest opening, Eur-Sib., Per., H, 17.IV.2016, <i>M. Karaköse</i> 1179
<i>Bidens tripartita</i> L.	867 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Inv., Ann., Th, 14.IX.2017, <i>M. Karaköse</i> 1276
<i>Carlina vulgaris</i> L.	1991 m, Akpınar village, <i>Pinus sylvestris</i> forest, Multi., Per., H, 22.VIII.2017, <i>M. Karaköse</i> 1222
<i>Carpesium cernuum</i> L.	890 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Multi., Per., H, 14.IX.2017, <i>M. Karaköse</i> 1277
<i>Centaurea helenioides</i> Boiss.	1351 m, Akpınar village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Eux., Per., H, End (NT), 22.VIII.2017, <i>M. Karaköse</i> 1239
<i>Centaurea jacea</i> L.	1013 m, Derindere village, mixed forest with <i>Fagus orientalis-Carpinus betulus</i> , Eur-Sib., Per., H, 24.VI.2016, <i>M. Karaköse</i> 1115
<i>Centaurea phrygia</i> L. subsp. <i>salicifolia</i> (M.Bieb. ex Willd.) Mikheev	916 m, Derindere village, Road side, Eux., Per., H, 11.VII.2019, <i>M. Karaköse</i> 1404
<i>Cichorium intybus</i> L.	871 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Multi., Per., H, 14.IX.2017, <i>M. Karaköse</i> 1274
<i>Cirsium arvense</i> (L.) Scop.	1340 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Multi., Per., H, 18.VII.2016, <i>M. Karaköse</i> 1203
<i>Cirsium echinus</i> (M.Bieb.) Hand.-Mazz.	1820 m, Akpınar village, <i>Picea orientalis</i> forest, Ir-Tur., Bia., H, 13.VIII.2016, <i>M. Karaköse</i> 1121
<i>Cirsium hypoleucum</i> DC.	1301 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Eur-Sib., Per., H, 24.VI.2015, <i>M. Karaköse</i> 1051
<i>Cirsium osseticum</i> (Adams) Petr.	1693 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Multi., Per., H, 03.VI.2015, <i>M. Karaköse</i> 994
<i>Cirsium pseudopersonata</i> Boiss. & Balansa ex Boiss. subsp. <i>pseudopersonata</i>	1314 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eux., Per., H, End (LC), 15.IX.2017, <i>M. Karaköse</i> 1259
<i>Cirsium trachylepis</i> Boiss.	1661 m, Akpınar village, mixed forest with <i>Pinus sylvestris-Picea orientalis</i> , Eux., Per., H, End (VU), 21.VII.2016, <i>M. Karaköse</i> 1141
<i>Cota tinctoria</i> (L.) J.Gay var. <i>tinctoria</i>	1510 m, Akpınar village, mixed forest with <i>Pinus sylvestris-Picea orientalis</i> , Multi., Per., H, 25.VI.2016, <i>M. Karaköse</i> 1114
<i>Cota triumfettii</i> (L.) J.Gay	1689 m, Güllüce village, mixed forest with <i>Picea orientalis-Pinus sylvestris</i> , Multi., Per., H, 17.VI.2015, <i>M. Karaköse</i> 1027
<i>Crepis bupleurifolia</i> (Boiss.) Freyn & Sint. ex Freyn & Sint.	1991 m, Akpınar village, <i>Pinus sylvestris</i> forest, Ir-Tur., Per., H, End (LC), 22.VIII.2017, <i>M. Karaköse</i> 1223
<i>Crepis foetida</i> L. subsp. <i>foetida</i>	1960 m, Akpınar village, mixed forest with <i>Pinus sylvestris-Picea orientalis</i> , Multi., Ann., Th, 07.IX.2017, <i>M. Karaköse</i> 1264
<i>Cyanus triumfettii</i> (All.) Dostál ex Á.Löve & D.Löve subsp. <i>triumfettii</i>	2057 m, Akpınar village, Pasture, Multi., Per., H, 11.IX.2018, <i>M. Karaköse</i> 1400

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Appendix (Continued)

<i>Doronicum orientale</i> Hoffm.	1785 m, Güllüce village, <i>Picea orientalis</i> forest, Multi., Per., G, 30.V.2015, <i>M. Karaköse</i> 992
<i>Erigeron annuus</i> (L.) Pers.	871 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Natr., Ann., Th, 14. IX.2017, <i>M. Karaköse</i> 1294
<i>Erigeron canadensis</i> L.	867 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Inv., Ann., Th, 14. IX.2017, <i>M. Karaköse</i> 1278
<i>Eupatorium cannabinum</i> L.	871 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., H, 14. IX.2017, <i>M. Karaköse</i> 1273
* <i>Filago germanica</i> (L.) Huds.	1592 m, Güllüce village, Road side, Multi., Ann., Th, 25.VIII.2017, <i>M. Karaköse</i> 1250
* <i>Galinsoga parviflora</i> Cav.	1314 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Cos., Ann., Th, 15. IX.2017, <i>M. Karaköse</i> 1303
<i>Gnaphalium sylvaticum</i> L.	2027 m, Güllüce village, <i>Pinus sylvestris</i> forest, Eur-Sib., Per., H, 19.IX.2017, <i>M. Karaköse</i> 1299
<i>Helichrysum arenarium</i> (L.) Moench subsp. <i>erzincanicum</i> P.H.Davis & Kupicha	2057 m, Akpınar village, Pasture, Ir-Tur., Per., H, End (VU), 13.IX.2017, <i>M. Karaköse</i> 1263
* <i>Helichrysum plicatum</i> DC. subsp. <i>plicatum</i>	1771 m, Güllüce village, Forest opening, Multi., Per., H, 15.IX.2018, <i>M. Karaköse</i> 1386
<i>Hieracium pannosum</i> Boiss. subsp. <i>bornmuelleri</i> (Freyn) Murr & Zahn	1504 m, Çakrak village, <i>Pinus sylvestris</i> forest, Multi., Per., H, End (LC), 15.IX.2017, <i>M. Karaköse</i> 1266
<i>Hieracium murorum</i> C.B.Clarke subsp. <i>oblongum</i> (Jord.) Zahn	1340 m, Güllüce village, <i>Picea orientalis</i> forest, Eur-Sib., Per., H, 24.VI.2015, <i>M. Karaköse</i> 995
* <i>Hypochaeris radicata</i> L.	1252 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., H, 14. IX.2017, <i>M. Karaköse</i> 1300
<i>Kemulariella caucasica</i> (Willd.) Tamamsch.	1735 m, Çakrak village, mixed forest with <i>Pinus sylvestris-Picea orientalis</i> , Eux., Per., H, 09.IX.2017, <i>M. Karaköse</i> 1269
* <i>Klasea quinquefolia</i> (Willd.) Greuter & Wagenitz	1126 m, Derindere village, Road side, Hyr-Eux., Per., H, 29.VIII.2019, <i>M. Karaköse</i> 1427
<i>Lactuca bourgaei</i> (Boiss.) Irish & Taylor	1683 m, Akpınar village, mixed forest with <i>Fagus orientalis-Picea orientalis</i> , Eux., Per., H, 08.VI.2016, <i>M. Karaköse</i> 1133
<i>Lactuca muralis</i> (L.) Fresen.	1122 m, Derindere village, <i>Fagus orientalis</i> forest, Eur-Sib., Per., H, 22.VI.2015, <i>M. Karaköse</i> 996
<i>Lactuca serriola</i> L.	825 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Bia., H, 14. IX.2017, <i>M. Karaköse</i> 1286
<i>Lapsana communis</i> L. subsp. <i>intermedia</i> (M.Bieb.) Hayek	1821 m, Akpınar village, mixed forest with <i>Picea orientalis-Pinus sylvestris</i> , Multi., Per., H, 20.VIII.2016, <i>M. Karaköse</i> 1106
<i>Lapsana communis</i> L. subsp. <i>grandiflora</i> (M.Bieb.) P.D.Sell	1515 m, Akpınar village, mixed forest with <i>Pinus sylvestris-Picea orientalis</i> , Eux., Per., H, 25.VI.2015, <i>M. Karaköse</i> 997
<i>Leontodon hispidus</i> L. subsp. <i>hastilis</i> (L.) Corb.	1806 m, Akpınar village, mixed forest with <i>Picea orientalis-Pinus sylvestris</i> , Eur-Sib., Per., H, 10.VI.2018, <i>M. Karaköse</i> 1334
<i>Petasites hybridus</i> (L.) G.Gaertn., B.Mey. & Scherb.	1328 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., H, 02. VII.2015, <i>M. Karaköse</i> 993
<i>Pilosella auriculoides</i> (Láng) Arv.-Touv.	1570 m, Çakrak village, mixed forest with <i>Pinus sylvestris-Picea orientalis</i> , Multi., Per., H, 22.VI.2015, <i>M. Karaköse</i> 1029
<i>Pilosella pilisquama</i> (Nägeli & Peter) Dostál	1991 m, Akpınar village, <i>Pinus sylvestris</i> forest, Eur-Sib., Per., H, 22.VI.2015, <i>M. Karaköse</i> 1028
<i>Pilosella piloselloides</i> (Vill.) Soják subsp. <i>piloselloides</i>	1301 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Multi., Per., H, 24.VI.2015, <i>M. Karaköse</i> 1052
* <i>Prenanthes petiolata</i> (K.Koch) Sennikov	1154 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Eux., Per., H, 06.VIII.2015, <i>M. Karaköse</i> 1098

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Appendix (Continued)

<i>Senecio leucanthemifolius</i> Poir. subsp. <i>vernalis</i> (Waldst. & Kit.) Greuter	890 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Multi., Ann., Th, 26. VII.2018, <i>M. Karaköse</i> 1328
* <i>Senecio vulgaris</i> L.	1314 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Multi., Ann., Th, 15. IX.2017, <i>M. Karaköse</i> 1251
<i>Sigesbeckia orientalis</i> L.	890 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Multi., Ann., Th, 20. IX.2017, <i>M. Karaköse</i> 1281
<i>Solidago virgaurea</i> L. subsp. <i>alpestris</i> (Waldst. & Kit.) Gaudin	825 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., H, 14. IX.2017, <i>M. Karaköse</i> 1235
* <i>Sonchus asper</i> (L.) Hill subsp. <i>glaucescens</i> (Jord.) Ball	890 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Multi., Ann., Th, 09. IX.2018, <i>M. Karaköse</i> 1351
<i>Tanacetum parthenium</i> (L.) Sch.Bip.	1397 m, Derindere village, mixed forest with <i>Fagus orientalis-Picea orientalis</i> , Multi., Per., H, 24.VI.2015, <i>M. Karaköse</i> 1050
<i>Tanacetum sorbifolium</i> (Boiss.) Grierson	871 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Eux., Per., H, 22. VIII.2018, <i>M. Karaköse</i> 1339
* <i>Taraxacum bessarabicum</i> (Hornem.) Hand.-Mazz.	1505 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Multi., Per., H, 08. VIII.2019, <i>M. Karaköse</i> 1454
<i>Taraxacum stevenii</i> DC.	1510 m, Güllüce village, mixed forest with <i>Pinus sylvestris-Picea orientalis</i> , Ir-Tur., Per., H, 28.VI.2016, <i>M. Karaköse</i> 1171
<i>Telekia speciosa</i> (Schreb.) Baumg.	1820 m, Akpınar village, <i>Picea orientalis</i> forest, Eur-Sib., Per., H, 08.VI.2016, <i>M. Karaköse</i> 1132
* <i>Tragopogon buphthalmoides</i> (DC.) Boiss. var. <i>buphthalmoides</i>	1771 m, Çakrak village, <i>Pinus sylvestris</i> forest, Ir-Tur., Per., H, 02.VII.2019, <i>M. Karaköse</i> 1446
<i>Tussilago farfara</i> L.	1223 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., G, 15. IX.2017, <i>M. Karaköse</i> 1290
* <i>Xanthium strumarium</i> L.	892 m, Derindere village, Road side, Multi., Ann., Th, 08.VII.2019, <i>M. Karaköse</i> 1415
<i>Xeranthemum annuum</i> L.	1592 m, Güllüce village, Road side, Multi., Ann., Th, 09.IX.2018, <i>M. Karaköse</i> 1340
Order: Dipsacales	
Adoxaceae E.Mey.	
<i>Sambucus ebulus</i> L.	1340 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., H, 24. VI.2015, <i>M. Karaköse</i> 1049
<i>Sambucus nigra</i> L.	1547 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Per., Ph, 19. IX.2017, <i>M. Karaköse</i> 1253
* <i>Viburnum orientale</i> Pall.	1640 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Eux., Per., Ph, 08.VI.2016, <i>M. Karaköse</i> 1131
Caprifoliaceae Juss.	
<i>Dipsacus pilosus</i> L.	1314 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eur-Sib., Bia., H, 15. IX.2017, <i>M. Karaköse</i> 1280
<i>Knautia involucrata</i> Sommier & Levier	1991 m, Akpınar village, <i>Pinus sylvestris</i> forest, Eux., Per., H, 25.VI.2016, <i>M. Karaköse</i> 1113
<i>Lonicera orientalis</i> M.Bieb.	1821 m, Akpınar village, mixed forest with <i>Picea orientalis-Pinus sylvestris</i> , Multi., Per., Ph, End (LC), 22.VIII.2015, <i>M. Karaköse</i> 1025
<i>Scabiosa ochroleuca</i> L.	1689 m, Akpınar village, mixed forest with <i>Picea orientalis-Pinus sylvestris</i> , Multi., Per., H, 22.VIII.2015, <i>M. Karaköse</i> 1026
<i>Valeriana alliariifolia</i> Vahl	1582 m, Güllüce village, mixed forest with <i>Fagus orientalis-Picea orientalis</i> , Multi., Per., G, 08.VI.2016, <i>M. Karaköse</i> 1120
Order: Apiales	
Araliaceae Juss.	
<i>Hedera helix</i> L.	889 m, Derindere village, mixed forest with <i>Picea orientalis-Carpinus betulus</i> , Multi., Per., Ph, 22.VIII.2016, <i>M. Karaköse</i> 1195

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Appendix (Continued)

<i>Hedera colchica</i> (K.Koch) K.Koch	1132 m, Derindere village, Road side, Eux., Per., Ph, 15.IX.2019, <i>M. Karaköse</i> 1424
Apiaceae Lindl.	
* <i>Angelica purpurascens</i> (Avé-Lall.) Gilli	1604 m, Çakrak village, Riparian side with <i>Alnus glutinosa</i> , Multi., Per., H, 15.IX.2019, <i>M. Karaköse</i> 1407
<i>Angelica sylvestris</i> L. var. <i>stenoptera</i> Avé-Lall.	1328 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eux., Per., H, End (EN), 25.VI.2016, <i>M. Karaköse</i> 1130
<i>Anthriscus nemorosa</i> (M.Bieb.) Spreng.	1750 m, Güllüce village, mixed forest with <i>Fagus orientalis-Picea orientalis</i> , Multi., Per., H, 24.VI.2015, <i>M. Karaköse</i> 1048
<i>Anthriscus sylvestris</i> (L.) Hoffm.	1592 m, Güllüce village, Road side, Multi., Per., H, 26.VI.2018, <i>M. Karaköse</i> 1310
<i>Astrantia maxima</i> Pall. subsp. <i>maxima</i>	1524 m, Akpınar village, Forest opening, Eux., Per., H, 14.VII.2018, <i>M. Karaköse</i> 1370
<i>Chaerophyllum aureum</i> L.	1315 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Multi., Per., H, 29.VI.2016, <i>M. Karaköse</i> 1152
<i>Daucus carota</i> L.	1547 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Multi., Bia., H, 15.IX.2017, <i>M. Karaköse</i> 1252
<i>Eryngium giganteum</i> M.Bieb.	1504 m, Çakrak village, <i>Pinus sylvestris</i> forest, Eux., Bia., H, 15.IX.2017, <i>M. Karaköse</i> 1304
<i>Grammosciadium platycarpum</i> Boiss. & Hausskn.	1510 m, Akpınar village, mixed forest with <i>Pinus sylvestris-Picea orientalis</i> , Ir-Tur., Per., H, 22.VIII.2016, <i>M. Karaköse</i> 1169
<i>Heracleum apiifolium</i> Boiss.	1328 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Eux., Per., H, 19.VII.2017, <i>M. Karaköse</i> 1216
<i>Heracleum platytaenium</i> Boiss.	890 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Eux., Per., H, 09.IX.2018, <i>M. Karaköse</i> 1325
<i>Ligusticum alatum</i> (M.Bieb.) Spreng.	1132 m, Derindere village, Road side, Multi., Per., H, 25.VIII.2019, <i>M. Karaköse</i> 1430
* <i>Oenanthe pimpinelloides</i> L.	1460 m, Güllüce village, mixed forest with <i>Picea orientalis-Fagus orientalis</i> , Multi., Per., H, 25.VI.2015, <i>M. Karaköse</i> 1105
<i>Pastinaca armena</i> Fisch. & C.A.Mey.	1247 m, Derindere village, mixed forest with <i>Fagus orientalis-Picea orientalis</i> , Multi., Bia., H, End (VU), 26.VI.2016, <i>M. Karaköse</i> 1176
<i>Pimpinella rhodantha</i> Boiss.	890 m, Derindere village, Riparian side with <i>Alnus glutinosa</i> , Multi., Per., H, 08.VII.2019, <i>M. Karaköse</i> 1412
<i>Sanicula europaea</i> L.	1676 m, Güllüce village, <i>Picea orientalis</i> forest, Eur-Sib., Per., H, 24.VI.2015, <i>M. Karaköse</i> 1047
<i>Scaligeria lazica</i> Boiss.	885 m, Derindere village, mixed forest with <i>Picea orientalis-Carpinus betulus</i> , Eux., Per., H, End (NT), 28.VI.2016, <i>M. Karaköse</i> 1194
* <i>Smyrniolum olusatrum</i> L.	1604 m, Çakrak village, Riparian side with <i>Alnus glutinosa</i> , Med., Bia., H, 08.VII.2019, <i>M. Karaköse</i> 1432
* <i>Torilis arvensis</i> (Huds.) Link subsp. <i>arvensis</i>	1314 m, Güllüce village, Riparian side with <i>Alnus glutinosa</i> , Multi., Per., H, 14.IX.2017, <i>M. Karaköse</i> 1275