



## Flora of Tunca Valley Natural Park and environs (Ardeşen-Rize/Turkey)

Hüseyin BAYKAL<sup>\*1</sup>, Vagif ATAMOV<sup>2</sup>, Turan YÜKSEK<sup>3</sup>

<sup>1</sup> Department of Plant and Animal Breeding, Pazar Vocational School, Recep Tayyip Erdogan University, Rize, Turkey

<sup>2</sup> Department of Biology, Faculty of Arts and Sciences, Recep Tayyip Erdogan University, Rize, Turkey

<sup>3</sup> Department of Landscape Architecture, Faculty of Fine Art, Design and Architecture, Recep Tayyip Erdogan University, 53100- Rize, Turkey

### Abstract

The aim of the study is to determine the flora of Tunca Valley Natural Park and environs (Ardeşen, Rize, Turkey). During the years 2016-2017, 1756 plant specimens were collected through comprehensive surveys. 408 taxa belonging to 244 genera and 64 families were identified. 1 of them is Lycopodiophyta, 16 of them are Pteridophyta and 391 were Magnoliophyta. The dispersion of Magnoliophyta is as follows; 2 Pinophytina and 389 Magnoliophytina. According to the total number of taxa, *Asteraceae* (44), *Poaceae* (31), *Fabaceae* (26), *Caryophyllaceae* (25) and *Rosaceae* (19) are the richest families. The distribution of phytogeographic elements are as follows: Euro-Siberian 237 (58.1%), Irano-Turanian 14 (3.4%), Mediterranean 5 (1.2%), and multiregional or of unknown phytogeographic origin 152 (37.3%). The life spectrum distribution is as: hemicryptophytes 196 (48.0%), cryptophytes 110 (26.9%), therophytes 46 (11.3%), chamaephytes 28 (6.8%), phanerophytes 28 (6.8%), vascular parasites 1 (0.2%). The endemism ratio is 4.9% (20 takson).

**Key words:** flora, natural park, Tunca Valley, Rize, Turkey

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## Tunca Vadisi Tabiat Parkı ve çevresinin florası (Ardeşen-Rize/Türkiye)

### Özet

Çalışmanın amacı Tunca Vadisi Tabiat Parkı ve çevresinin florasının belirlenmesidir. 2016-2017 yılları arasında kapsamlı arazi çalışmaları sonucu 1756 bitki örneği toplanmıştır. 64 familya ve 244 cinse ait 408 bitki taksonu teşhis edilmiştir. Tespit edilen taksonların 1'i Lycopodiophyta, 16'sı Pteridophyta ve 391'i ise Magnoliophyta'dır. Toplam takson sayısı bakımından *Asteraceae* (44), *Poaceae* (31), *Fabaceae* (26), *Caryophyllaceae* (25) ve *Rosaceae* (19) familyaları en zengin familyalardır. Fitocoğrafik elemanların dağılımı şu şekildedir: Avrupa-Sibirya 237 (%58,1), İran-Turan 14 (%3,4), Akdeniz 5 (%1,2), ve çok ya da bilinmeyen bölgesi 152 (%37,3). Hayat formu dağılımı: hemikriptofitler 196 (%48,0), kriptofitler 110 (%26,9), terofitler 46 (%11,3), kamefitler 28 (%6,8), fanerofitler 28 (%6,8), vasküler parazitler 1 (0,2%) şeklindedir. Endemizm oranı %4.9 (20 takson)'dir.

**Anahtar kelimeler:** flora, tabiat parkı, Tunca Vadisi, Rize, Türkiye.

### 1. Introduction

#### 1.1. Geographical Features of The Study Area

Tunca Natural Park is in Rize, 55 km away from city centre and 18 km away from Ardeşen district. The study area covers a total 40820 decare. It lies between the latitudes 41° 08' 506 and 41° 07' 031 and the longitudes 41° 20' 491 and 41° 35' 769. Tunca Natural Park is at A8 square of Euro-Siberian phytogeographical region Davis (1965-1985). The lowest part of the study area is 1350 m and the highest part is 3159 m (Figure 1).

\* Corresponding author / Haberleşmeden sorumlu yazar: Tel.: + +904646127317; Fax.: + 90464 6127316; E-mail: huseyin.baykal@erdogan.edu.tr

### 1.2. Geology and Edaphic Features

Rize composed of Hemşindere, Rize, Kaplıca, Melyat, Pazar and Hamidiye geological formations. Even though the generalized columnar section is such mentioned the formation at the surface, changes in different part of Rize. Tunca Natural Park totally composed of Hemşindere formation of upper Cretaceous age, which comprises basic and acid volcanic such as basaltic andesite, rhyolite, dacite, rhyolite, and some andesitic intermediate volcanics (Gedik et al., 1992).

The high parts of the study area consists of scars and rifts, the rest of the area has three main soil types, namely non-calcareous forest soil, grey-brown podzol soil and high mountain meadow soils (Anonymous, 2005).

### 1-3. Climatological Features

The climatic data of Pazar station (Anonymous, 2011) were interpolated (Çepel, 1978; Doğan 1977) for the altitude of 1700 m. According to these interpolated data Walter climate diagram for the research area was drawn. The climate in the study area is very-humid, mesothermal without any dry season. The precipitation regime is as autumn, winter, spring and summer (Au.Wi.Su.Si.). January, February, March and December are the frosty months while April and November are the probable frosty months (Figure 2).



Figure 1. Map of the study area

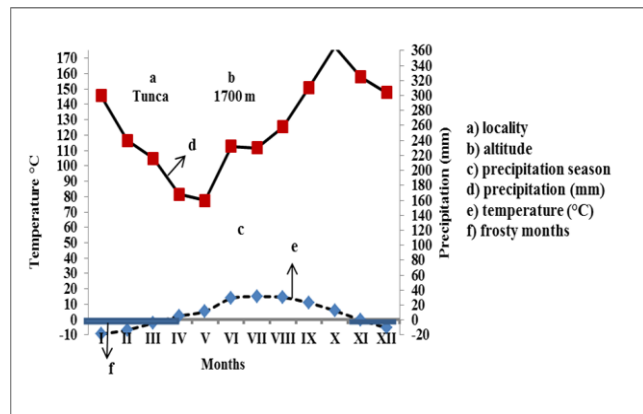


Figure 2. Climatological diagram of the area

## 2. Materials and methods

The materials of the study are the vascular plant taxa collected (1756 plant taxa) from Tunca Valley Natural Park between the years 2016-2017. The samples for each taxon were dried and stuck according to herbarium rules (Erik et al., 1996) and preserved in the herbarium of Biology Department, Faculty of Arts and Sciences, Recep Tayyip Erdoğan University. The taxa were identified using The Flora of Turkey and the Aegean Islands (Davis, 1965-1985; Davis et al., 1988; Güner et al., 2000). The taxa also checked with Russian flora (Komarov and Shishkin, 1933-1964), Flora of Georgia (Ketzkhoveli and Gagnidze, 1971-2001) and related studies (Eminağaoğlu, 2003, 2004; Baykal & Atamov, 2016). The list of the identified taxa are given according to APG III (Angiospermi Phylogeny Group) in alphabetical order (Güner et al., 2012). The family and taxon name (including in Turkish), author and locations are given correspondingly (Güner et al., 2012). The endemism status (Güner, 2012), threatened categories (Ekim et al., 2000; Anonymous, 2017), phytogeographical regions (Davis, 1965-1985; 1988), and life forms (Raunkiaer, 1934; Ellenberg and Mueller-Dombois, 1967) were also given.

### Abbreviations

m.: meter

Euro-Sib: Euro-Siberian element

Eux: Euxine element

Hycr-Eux: Hyrcano-Euxine element

Ir-Tur: Irano-Turanian element

Medit: Mediterranean element

Cosm: Cosmopolitan

Hycr-Eux, and Eux were evaluated as subcategories of Euro-Sib.

EN: Endangered

LC: Least concern

NE: Not evaluated

NT: Near threatened

VU: Vulnerable

HB: Hüseyin Baykal

Hcrp: Hemicryptophytes

Crp: Cryptophytes

Thp: Therophytes

Chp: Chamaephytes

Php: Phanerophytes

## 3. Results

### The Floristic List

#### Lycopodiophyta / Kibritotu Bölümü

##### Lycopodiidae / Kibritotu Altısmfı

#### Lycopodiaceae / Kibritotugiller

*Huperzia selago* (L.) Bernh. / dik hibritotu.

Among *Rhododendron* shrubs, 1550 m, 22.07.2016, HB 1564 Euro-Sib, Hcrp.

**Pteridophyta / Eğreliti Bölümü****Equisetidae / Atkuyruğu Altısmfı****Equisetaceae / Atkuyruğugiller**

*Equisetum arvense* L. / atkuyruğu.  
Streamsides, 1650 m, 08.06.2016, HB 1237, Crp.

**Polypodiidae / Eğrelti Altısmfı****Aspleniaceae / Saçakotugiller**

*Asplenium adiantum-nigrum* L. / kara saçakotu.  
On damp rocky surfaces, 1700 m, 12.08.2017, HB 1864 Crp.

*A. scolopendrium* L. / geyikdili.  
Shady rocky surfaces, 2000 m, 06.08.2016, HB 1645 Crp.

*A. septentrionale* (L.) Hoffm. / devesakalı  
At grikes, 1550 m, 05.09.2016, HB 1751  
Eux, Crp.

*A. trichomanes* L. / saçakotu.  
On rocky surfaces, 1900 m, 20.08.2016, HB 1699 Crp.

*A. woronowii* H. Christ. / kızıl baldırıkara.  
Screes, 2200 m, 22.07.2016, HB 1588  
Euro-Sib, Crp.

**Athyriaceae / Yeleğreltisigiller**

*Athyrium filix-femina* (L.) Roth. / yel eğreltisi.  
Above forest, 1750 m, 14.07.2017, HB 1839 Crp.

*A. alpestre* (Hoppe). Clairv. / dağyeli.  
Rocky surfaces, 2050 m, 06.08.2016, HB 1624 Crp.

**Cystopteridaceae / Gevrekēğreltiler**

*Gymnocarpium dryopteris* (L.) Newman / baldırıcıplak.  
Rocky slopes, 1700 m, 23.06.2016, HB 1350 Crp.

**Dennstaedtiaceae / Eğreltiler**

*Pteridium aquilinum* (L.) Kuhn / eğrelti.  
Above forest, 1850 m, 23.06.2016, HB 1330 Crp.

**Dryopteridaceae / Puluçgiller**

*Dryopteris dilatata* (Hoffm.) A. Gray. / ayu piluncu.  
Screes, 1900 m, 12.08.2017, HB 1868 Crp.

*D. filix-mas* (L.) Schott. / erkek eğrelti.  
Among rocks, 1600 m, 28.06.2017, HB 1804 Crp.

*Polystichum woronowii* Fomin. / çat piluncu.  
Among rocks, 1600 m, 22.07.2016, HB 1540 VU, Hyrc-Eux, Crp.

**Osmundaceae / Kraleğretisigiller**

*Osmunda regalis* L. / kral eğreltisi.  
Damp streamsides, 1600 m, 07.07.2016, HB 1450 Crp.

**Polypodiaceae / Benliēğreltiler**

*Polypodium vulgare* L. var. *vulgare* / benli eğrelti.  
On rocky surfaces, 1600 m, 07.07.2016, HB 1480 Crp.

**Pteridaceae/ Baldırıkarağiller**

*Cryptogramma crispa* (L.) R. Br. ex Hook. / saklı eğrelti.  
Screes, 2050 m, 27.07.2017, HB 1853  
Euro-Sib, Crp.

**Magnoliophyta / Tohumlu Bitkiler Bölümü****Pinophytina / Açık Tohumlular Sınıfı****Pinidae / Çamlar altısmfı****Cupresaceae / Servigiller**

*Juniperus oxycedrus* L. subsp. *oxycedrus* / katran ardıcı.  
Mixed forest, 1700 m, 23.06.2016, HB 1317  
Php.

**Pinaceae / Çangiller**

*Picea orientalis* (L.) Peterm. / ladin.  
Mixed forest, 1700 m, 23.06.2016, HB 1325  
Eux, Php.

**Magnoliophytina / Kapalı Tohumlular Sınıfı****Adoxaceae / Mürvergiller**

*Sambucus ebulus* L. / mürver otu.  
Forest, 1700 m, 14.07.2017, HB 1824  
Euro-Sib, Chp.

*S. nigra* L. / ağaç mürver.  
Edge of forest, 1700 m, 23.06.2016, HB 1347  
Euro-Sib, Php.

*Viburnum orientale* Pall. / katkat çalısı.  
Shrub communities, 1750 m, 07.07.2016, HB 1485  
Eux, Php.

**Amaryllidaceae / Nergisgiller**

*Allium schoenoprasum* L. / peynir sirmosu.  
Alpine meadows, 2500 m, 06.08.2016, HB 1668  
Crp.

*A. scorodoprasum* L. subsp. *rotundum* (L.) Stearn / deli pırasa.  
Stony paces, 1500 m, 24.05.2016, HB 1166  
Crp.

*A. szovitsii* Regel / yayla körmeni.  
Alpine meadows, 2550 m, 20.08.2016, HB 1710  
Eux (mt), Crp.

**Apiaceae / Maydonozgiller**

*Bupleurum falcatum* L. subsp. *polyphyllum* (Lebed.) H. Wolff / bolşeytan.  
Meadows, 2250 m, 06.08.2016, HB 1615  
Eux (mt), Hcrp.

*Carum carvi* L. / kimyon.  
Damp meadows, 2500 m, 22.07.2016, HB 1573  
Chp.

*Caulis platycarpus* L. / kavkal.  
Meadows, 2300 m, 27.07.2017, HB 1849  
Thp.

*Chaerophyllum astrantiae* Boiss. & balnsa ex Boiss. / yilandokotu.  
Stony places, 2600 m, 20.08.2016, HB 1713  
NT, Eux, Hcrp.

*Chamaescidium acaule* (Bieb.) Boiss. / hamotu.  
Pastures, 2450m, 22.07.2016, HB 1592  
Hyrc-Eux, Hcrp.

*Heracleum apiifolium* Boiss. / telehaş.  
Streamsides, 1800 m, 22.07.2016, HB 1577  
Eux (mt), Hcrp.

*H. platyaenium* Boiss. / öğrekotu.  
Streamsides, 1700 m, 07.07.2016, HB 1471  
LR (Ic), Eux, Hcrp.

*H. sphondylium* L. subsp. *cyclocarpum* (C.Koch.) P.H.Davis / çember koçuk.  
Streamsides, 1700 m, 07.07.2016, HB 1490  
Eux, Hcrp.

*Pimpinella affinis* Lebed. / enisen.  
Meadows, 2100 m, 14.07.2017, HB 1822  
Hcrp.

*Sanicula europaea* L. / sanikel.  
Forest, 1700 m, 23.06.2016, HB 1358  
Euro-Sib, Hcrp.

*Seseli libanotis* Koch / dağ havucu.  
Meadows, 1700 m, 07.07.2016, HB 1454  
Euro-Sib, Crp.

**Aquifoliaceae / Işılğangiller**

*Ilex colchica* Pojark / ışılğan.  
Forest, 1700 m, 08.06.2016, HB 1228  
Eux, Php.

**Araliaceae / Sarmaşıkçiller**

*Hedera colchica* (K.Koch.) K.Koch / kara sarmaşık.  
On trees and rocky surfaces, 1700 m, 23.06.2016, HB 1355  
Eux, Php.

**Asparagaceae / Kuşkonmazgiller**

*Muscari aucheri* (Boiss.) Baker / gök müşkürüm.  
Stony meadows, 2200 m, 08.06.2016, HB 1232  
Crp.  
*Ornithogalum oligophyllum* E. D. Clarke / kurt soğanı.  
Stony slopes, 2500 m, 16.06.2017, HB 1791  
Crp.

*Polygonatum verticillatum* (L.) All. / mührüsüleyman.  
*Rhododendron* shrubs, 2150 m, 08.06.2016, HB 1245  
Euro-Sib, Crp.

*Scilla monanthos* K. Koch / sümbülcük.  
Subalpine meadows, 2100 m, 24.05.2016, HB 1169  
Eux, Crp.

**Asteraceae / Papatyagiller**

*Achillea biserrata* Bieb. / aksırıkotu.  
Damp meadows, 2100 m, 22.07.2016, HB 1558  
Eux, Hcrp.

*A. latiloba* Ledeb. ex. Nordm. / siporiş.  
Alpine meadows, 2800 m, 06.08.2016, HB 1620  
Eux (mt), Crp.

*A. millefolium* L. subsp. *millefolium* / civanperçemi.  
Alpine meadows, 2900 m, 05.09.2016, HB 1757  
Euro-Sib, Hcrp.

*Anthemis cretica* L. subsp. *iberica* (M. Bieb.) Grierson / kaf papatyası.  
Screes, 2950 m, 20.08.2016, HB 1720  
Eux (mt), Hcrp.

*Archantemis marschalliana* (Willd.) Lo Presti & Oberpr.  
subsp. *pectinata* (Boiss.) Lo Presti & Oberpr. / sarı sığırgözü.  
Screes, 2850 m, 06.08.2016, HB 1653  
Eux, Hcrp.

*Arctium platylepis* (Boiss. & Balansa) Sosn. ex. Grossh. / baldikeni.  
Streamsides, 2350 m, 05.09.2016, HB 1760  
Eux, Hcrp.

*Aster amellus* L. subsp. *ibericus* (Stev.) V.E. Avet / patçiçeği.  
Stony slopes, 2350 m, 06.08.2016, HB 1629  
Eux, Crp.

*Bidens tripartita* L. / üçsuketeni.  
Streamsides, 1850 m, 20.08.2016, HB 1693  
Thp.

*Carduus adpressus* C.A.Mey. / tomara.  
Pastures, 2400 m, 22.07.2016, HB 1548  
Eux, Hcrp.

*Centaurea helenioides* Boiss. / döknel sarıbaş.  
Pastures, 2350 m, 22.07.2016, HB 1576  
Endemic, NT, Hcrp.

*Cirsium arvense* (L.) Scop. / köygöçüren.  
Streamsides, 2300 m, 12.10.2016, HB 1781  
Hcrp.

*C. echinus* (M. Bieb.) Hand.-Mazz. / kirpi kangalı.  
Screes, 2300 m, 22.07.2016, HB 1593  
Ir-Tur, Hcrp.

*C. osseticum* (Adams) Petr. subsp. *osseticum* / garip kangal.  
Pastures, 1700 m, 27.07.2017, HB 1852  
Hcrp.

*Crepis paludosa* (L.) Moench. / su kıskısı.  
Meadows, 1800 m, 22.07.2016, HB 1565  
Euro-Sib, Crp.

*Cyanus nigrifimbrius* (C.Koch) Sojak / tay boncuğu.  
Alpine meadows, 2500 m, 27.07.2017, HB 1846  
Eux (mt), Hcrp.

*Doronicum orientale* Hoffm. / kaplanotu.

Under shrubs, 1750 m, 07.07.2016, HB 1491  
Crp.

*Erigeron annuus* (L.) Pers. / hemşin şifafotu.  
Streamsides, 1700 m, 12.08.2017, HB 1867  
Hcrp.

*E. caucasicus* Steven subsp. *caucasicus* / kaf şifaotu.  
Stony slopes, 2850 m, 22.07.2016, HB 1597  
Euro-Sib, Hcrp.

*E. caucasicus* Stev. subsp. *venustus* (Botsch.) Grierson / zarif şifaotu.  
Stony slopes, 2600 m, 22.07.2016, HB 1567  
Hcrp.

*Helichrysum arenarium* (L.) Moench subsp. *aucheri* (Boiss.)  
Davis & Kupicha / yayla çiçeği.  
Meadows, 2700 m, 06.08.2016, HB 1613  
Ir-Tur, Hcrp.

*Hieracium djimilense* Boiss. & Balansa / cimil şahinotu.  
Meadows among screes, 1750 m, 08.06.2016, HB 1239  
Endemic, VU, Eux, Hcrp.

*H. labillardierei* Arv-Touv. / kızıl şahinoyu.  
Stony slopes, 1900 m, 23.06.2016, HB 1336  
Hcrp.

*Inula orientalis* Lam. / şark andızotu.  
Damp pastures, 2600 m, 22.07.2016, HB 1563  
Eux (mt), Crp.

*Lactuca intricata* Boiss. / güzel merhemotu.  
Stony slopes, 1700 m, 27.07.2017, HB 1856  
Euro-Sib, Hcrp.

*L. serriola* L. / eşekhelvası.  
Stony slopes, 2300 m, 22.07.2016, HB 1546  
Medit, Hcrp.

*Lapsana communis* L. subsp. *intermedia* (Bieb.) Hayek. / şebrek.  
Streamsides, 2200 m, 20.08.2016, HB 1695  
Hcrp.

*Leontodon hispidus* L. var. *hispidus* / gülükazer.  
Screes, 2400 m, 22.07.2016, HB 1534  
Euro-Sib, Crp.

*Petasites albus* (L.) P. Gaertn. / lapaza çiçeği.  
Damp slopes close to stream, 1750 m, 24.05.2016, HB 1161,  
Euro-Sib, Crp.

*P. hybridus* ((L.) P. Gaertn. / kabalak.  
Streamsides, 1750 m, 08.06.2016, HB 1227  
Euro-Sib, Crp.

*Pilosella officinarum* Vaill. / tırnakotu.  
Stony slopes, 1700 m, 07.07.2016, HB 1458  
Chp.

*Prenanthes abietina* (Boiss. & Balansa) Kirp. / sarı eğikçiçek.  
Close to forest border, 2600 m, 06.08.2016, HB 1626  
Eux, Hcrp.

*Psephellus appendicigerus* (K. Koch) Wagenitz / ovit tülübaşı.  
Screes, 2600 m, 06.08.2016, HB 1635  
Endemic, EN B2ab (ii, iii, v), Eux (mt), Hcrp.

*Sonchus asper* (L.) Hill subsp. *glaucescens* (Jord.) Ball / eşekgevreği.  
Forest clearings, 1700 m, Hcrp.

*Tanacetum kotschyi* (Boiss.) Grierson. / pireotu.  
Stony slopes, 2600 m, 06.08.2016, HB 1651  
Ir-Tur, Hcrp.

*T. macrophyllum* (Waldst. & Kit.) Sch. / koca pireotu  
Pastures, 2200 m, 06.08.2016, HB 1622  
Euro-Sib, Hcrp.

*Taraxacum butleri* Van. Soest / karahindiba.  
Roadsides, 2100 m, 23.06.2016, HB 1349  
Hcrp.

*T. stevenii* DC. / gelingöbeği.

Alpine meadows, 2550 m, 06.08.2016, HB 1669  
Ir-Tur, Hcrp.

*Telekia speciosa* (Schreber.) Baumg. / puğre.  
Stony meadows, 1700 m, 28.08.2017, HB 1874  
Euro-Sib, Hcrp.

*Tragopogon aureus* Boiss. / sarı yemlik.  
Pastures, 2150 m, 22.07.2016, HB 1578  
Endemic, LC (lc), Eux, Hcrp.

*Tripleurospermum caucasicum* (Willd.) Hayek / akbabotu.  
Damp meadows, 2550 m, 20.08.2016, HB 1709  
Crp.

*T. orades* (Boiss.) Rech. var. *tchihatchewii* (Boiss.) E.  
Hossain / hoşhoş.  
Meadows, 2200 m, 22.07.2016, HB 1550  
Crp.

*Tussilago farfara* L. / öksürükoyu.  
Damp slopes, 2200 m, 24.05.2016, HB 1165  
Euro-Sib, Crp.

*Turanecio taraxacifolius* (Bieb.) Hamzaoglu var.  
*taraxacifolius* / kar turanotu.  
Stony slopes, 2550 m, 22.07.2016, HB 1557  
Hcrp.

*Xanthium spinosum* L. / pıtrak.  
Roadsides, 1700 m, 20.08.2016, HB 1716  
Cosmopolite, Thp.

#### **Betulaceae / Huşgiller**

*Alnus glutinosa* (L.) Gaertn. subsp. *barbata* (C.A. Mey.) Yalt.  
/ yeykin.  
Streamsides, 1650 m, 24.05.2016, HB 1160  
Euro-Sib, Php.

*Betula medwediewii* Regel. / moşi.  
Forest, 2000 m, 24.05.2016, HB 1171  
Eux, Php.

#### **Boraginaceae / Hodangiller**

*Asperugo procumbens* L. / nevazilotu.  
Stony places, 2100 m, 28.06.2017, HB 1819  
Euro-Sib, Thp.

*Buglossoides arvensis* (L.) I. M. Johnston. / tala taşkeseni.  
Stony slopes, 2300 m, 23.06.2016, HB 1342  
Thp.

*Cynoglossum holosericeum* Steven / yayla köpek dili.  
Screes, 3000 m, 22.07.2016, HB 1568  
VU, Eux (mt), Hcrp.

*Echium vulgare* L. / engerekotu.  
Roadsides, 2100 m, 27.07.2017, HB 1854  
Euro-Sib, Crp.

*Myosotis alpestris* F.W. Schmidt. subsp. *alpestris* /  
boncukotu.  
Alpine meadows, 2600 m, 20.08.2016, HB 1701  
Hcrp.

*M. laxa* Lehm. subsp. *caespitosa* (Schutz) Hyl. ex Nordh. /  
hüthütgözü.  
Damp meadows, 1900 m, 22.07.2016, HB 1570  
LR (lc), Thp.

*M. lazica* M. Popov / laz kuşgözü.  
Damp stony places, 07.07.2016, HB 1483  
VU, Eux, Thp.

*M. sylvatica* Hoffm. subsp. *rivularis* Vestergr. / keleş  
unutmabeni.  
Damp meadows, 2500 m, 06.08.2016, HB 1666  
Hycr-Eux (mt), Hcrp.

*Nonea versicolor* (Steven.) Sweet / çayır sormuğu.  
Pastures, 2350 m, 14.07.2017, HB 1837  
Eux (mt), Thp.

*Symphytum ibericum* Steven ex M. Bieb. / orman kafesotu.  
Shady meadows, 1750 m, 07.07.2016, HB 1475  
Eux, Hcrp.

*Trachystemon orientalis* (L.) G. Don / kaldirik.  
Streamsides, 1700 m, 08.06.2016, HB 1241  
Eux, Hcrp.

#### **Brassicaceae / Turpgiller**

*Aethionema arabicum* (L.) Andr. ex DC. / arap taşçantası.  
Stony slopes, 2000 m, 23.06.2016, HB 1320  
Cosmopolite, Thp.

*Alyssum murale* Waldst & Kit. var. *alpinum* Boiss. ex Nyar. /  
seki kuduzotu.  
Meadows, 2200 m, 07.07.2016, HB 1474  
Hcrp.

*A. murale* Waldst & Kit. var. *murale* / seki kuduzotu.  
Roadsides, 1900 m, 28.06.2017, HB 1806  
Hcrp.

*Barbarea plantaginea* DC. / götlez götü.  
Streamsides, 2050 m, 23.06.2016, HB 1333  
Hcrp.

*Capsella bursa-pastoris* (L.) Medik. / çobançantası.  
Roadsides, 1900 m, 12.08.2017, HB 1866  
Cosmopolite, Thp.

*C. hirsuta* L. / kıllı kodim.  
Damp meadows, 2250 m, 22.07.2016, HB 1545  
Cosmopolite, Crp.

*Cardamine impatiens* L. subsp. *Impatiens* / sultan kadimotu.  
Shady slopes, 2300 m, 28.08.2017, HB 1871  
Euro-Sib, Crp.

*C. impatiens* L. subsp. *pectinata* (Pall. ex DC.) Stoj. & Stef. /  
taraklı kadimoyu.  
Damp spaces, 1750 m, 06.08.2016, HB 1649  
Euro-Sib, Crp.

*Draba hispida* Willd. / kıllı dolama.  
Rocky surfaces, 2500 m, 27.07.2017, HB 1857  
Hycr-Eux (mt), Chp.

*D. huetii* Boiss. / çayır dolaması.  
Meadows, 1700 m, 24.05.2016, HB 1167  
Chp.

*D. polytricha* Ledeb. / rize dolaması.  
Rocky surfaces, 2600 m, 22.07.2016, HB 1536  
Chp.

*D. siliquosa* M. Bieb. / yıldız dolama.  
Rocky surfaces, 2100 m, 28.06.2017, HB 1809  
Hycr-Eux (mt), Chp.

*Erysimum pulchellum* (Willd.) J. Gay. / kaba zarife.  
Screes, 2100 m, 28.08.2017, HB 1872  
Thp.

*Hesperis matronalis* L. / akşam yıldızı.  
Damp slopes, 2200 m, 22.07.2016, HB 1559  
Crp.

*Murbeckiella huetii* (Boiss.) Rothm. / ovitkodimi.  
Rocky slopes 2300 m, 14.07.2017, HB 1835  
Hcrp.

*Nasturtium officinale* L. Br. / su teresi.  
Streamsides, 1700 m, 23.06.2016, HB 1329  
Crp.

*Rorippa sylvestre* (L.) Besser / çakandura.  
Damp places, 1750 m, 05.09.2016, HB 1759  
Hcrp.

*Thlaspi arvense* L. / ekin dağarcığı.  
Ridgeways, 1750 m, 20.05.2017, HB 1787  
Cosmopolite, Thp.

#### **Campanulaceae / Çançiçeğigiller**

*Asyneuma amplexicaule* (Willd.) Hand.-Mazz. subsp.  
*amplexicaule* / hoşdeğnek.  
Stony slopes, 2350 m, 27.07.2017, HB 1847  
Hcrp.

*Campanula collina* Sims / çayır cingırağı.  
Pastures, 2600 m, 22.07.2016, HB 1584

Eux, Crp.

*C. lactiflora* M. Bieb. / kupida.

Alpine meadows, 2400 m, 05.09.2016, HB 1746

Eux, Hcrp.

*C. olympica* Boiss. / orman çanı.

Alpin meadows, 2500 m, 06.08.2016, HB 1665

Eux, Hcrp.

*C. rapunculoides* L. / elmacık.

Meadows, 2100 m, 22.07.2016, HB 1575

Euro-Sib, Hcrp.

#### **Caprifoliaceae / Hammeligiller**

*Cephalaria gigantea* (Lebed.) Bobrov / dev pelemir.

Streamsides, 1800 m, 07.07.2016, HB 1453

Eux, Hcrp.

*Knautia involucrata* Sommier & Levier / deli eşekkulağı.

Alpine slopes, 2600 m, 12.08.2017, HB 1863

Eux (mt), Hcrp.

*Lonicera orientalis* Pall. / has çakkana.

Roadsides close to shrub communities, 1800 m, 07.07.2016, HB 1478

Endemic, LR (lc), Chp.

*Scabiosa columbaria* L. subsp. *columbaria* / uyuzotu.

Meadows close to roadsides, 1800 m, 20.08.2016, HB 1717

Hcrp.

*Valeriana alliariifolia* Adams / piot.

Streamsides, 2300 m, 22.07.2016, HB 1598

Euro-Sib, Hcrp.

*V. alpestris* Steven / yayla kediotu.

Meadows, 2850 m, 06.08.2016, HB 1611

Eux (mt), Hcrp.

#### **Caryophyllaceae / Karanfilgiller**

*Agrostemma githago* L. / buğday karamuğu.

Roadside, 1700 m, 07.07.2016, HB 1484

Thp.

*Arenaria rotundifolia* M. Bieb. subsp. *rotundifolia* / yer kumotu.

Crevices, 2550 m, 20.08.2016, HB 1718

Thp.

*A. serpyllifolia* L. / tarla kumotu.

Meadows on rocky places, 2400 m, 22.07.2016, HB 1555

Thp.

*Cerastium cerastioides* (L.) Britt. / yumak boynuzotu.

Pastures, 06.08.2016, 2200 m, HB 1661

Hcrp.

*C. glomeratum* Thuill. / boynuzotu.

Meadow slopes, 1700 m, 12.08.2017, HB 1869

Cosmpolite, Thp.

*C. purpurascens* Adams / alaca boynuzotu.

Screes, 2300 m, 22.07.2016, HB 1547

Euro-Sib(mt), Hcrp.

*Dianthus crinitus* Sm. var. *crinitus* / uzunçanak.

Rocky slopes, 2300 m, 06.08.2016, HB 1672

Hcrp.

*D. orientalis* Adams / yar karanfili.

Screes, 2400 m. 05.09.2016, HB 1737

Hcrp.

*Eremogone lychnidea* (M. Bieb.) Rupr. / topaç kumotu.

Rocky surfaces, 2400 m, 06.08.2016, HB 1627

Thp.

*Gypsophila glandulosa* (Boiss.) Walp. / yer çevgeni.

Meadows, 2650 m, 20.08.2016, HB 1703a

Eux(mt), Hcrp.

*G. silenoides* Rupr. / furtuna çöveni.

Meadows, 2400 m, 06.08.2016, HB 1621

Endemic, Eux (mt), Hcrp.

*G. tenuifolia* M. Bieb. / kaçkar çevgeni.

Meadows, 2600 m, 20.08.2016, HB 1703b

VU, Eux(mt), Hcrp.

*Minuartia imbricata* (M. Bieb.) Woronow / kaya tıstısı.

Rocky slopes, 2700 m, 06.08.2016, HB 1612

Eux(mt), Hcrp.

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

McNeil / eğri tıstıs.

Mountain slopes, 2900 m, 20.08.2016, HB 1690

Hcrp.

*M. verna* (L.) Hiern subsp. *verna* / yaz tıstısı.

Alpine meadows, 2700 m, 06.08.2016, HB 1636

Chp.

*Petrorhagia saxifraga* (L.) Link / şimal zarçiçeği.

Meadows, 1700 m, 12.08.2017, HB 1862

Euro-Sib, Hcrp.

*Sagina saginoides* (L.) Karst / yayla saginotu.

Meadows, 2250 m, 28.06.2017, HB 1811

Thp.

*Saponaria orientalis* L. / deli sabunotu.

Rocky slopes, 1900 m, 06.08.2016, HB 1664

LC, Thp.

*Silene italica* (L.) Pers. subsp. *italica* / yuğuşyüreği.

Meadows close to streams, 2100 m, 22.07.2016, HB 1542

Hcrp.

*S. lazica* Boiss. / laz nakılı.

Roadsides, 2050 m, 07.07.2016, HB 1476

Eux (mt), Hcrp.

*S. odontopetala* Fenzl / kunduzotu.

Meadows on rocky slopes, 2700 m, 05.09.2016, HB 1748

Hcrp.

*S. saxatilis* Sims / simotu.

Rocky slopes, 2500 m, 06.08.2016, HB 1643

Hcrp.

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

Meadows, 2600 m, 06.08.2016, HB 1633

Hcrp.

*Stellaria holostea* L. / urgancık.

Under shrubs, 1750 m, 16.06.2017, HB 1790

Euro-Sib, Thp.

*S. media* (L.) Vill. / kuşotu.

Meadows, 2200 m, 08.06.2016, HB 1243

Thp.

#### **Celastraceae / İğaçgiller**

*Parnassia palustris* L. / yürekyağrağı.

Streamsides, 2300 m, 20.08.2016, HB 1711a

Crp.

#### **Cistaceae / Ladengiller**

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

Meadow slopes, 2150 m, 22.07.2016, HB 1561

Hcrp.

#### **Colchicaceae / Acıçığdemgiller**

*Colchicum speciosum* Steven / şepart.

Alpine meadows, 2450 m, 05.09.2016, HB 1756

Euro-Sib, Crp.

#### **Convolvulaceae / Tarlasarmaşığıgiller**

*Calystegia silvatica* (Kit.) Griseb. / büyük.

Edge of forest, 1700 m, 23.06.2016, HB 1348

Hcrp.

*Convolvulus arvensis* L. / tarla sarmaşığı.

Roadsides, 1850 m, 07.07.2016, HB 1460

Cosmopolite, Hcrp.

#### **Crassulaceae / Damkoruğugiller**

*Phedimus spurius* (M. Bieb.) 't Hart / al pisikulağı.

Rocky surfaces, 2300 m, 07.07.2016, HB 1451

Hycr-Eux, Crp.

*P. stoloniferum* (S.G.Gmel) 't Hart / pisikulağı

Screes, 2100 m, 28.06.2017, HB 1820

Hyrç-Eux, Crp.

*Prometheum pilosum* (M. Bieb) H. Obha / hoş kayagöbeği.

Rocky surfaces, 2200 m, 23.06.2016, HB 1353

Hyrç-Eux, Crp.

*Sedum album* L. / çobankavurgası.

Rocky surfaces, 2200 m, 22.07.2016, HB 1544

Hcrp.

*S. alpestre* Vill. / dağ kuruğu.

Screes, 2450 m, 06.08.2016, HB 1628

Hcrp.

*S. tenellum* M. Bieb. / narin damkuruğu.

Rock fractures, 2900 m, 05.09.2016, HB 1738

Hcrp.

*Sempervivum armenum* Boiss. & A. Huet. var. *armenum* / gelinparmağı.

Rocky surfaces, 2900 m, 05.09.2016, HB 1749

Endemic, LC, Eux (mt), Hcrp.

#### **Cyperaceae / Hasırotugiller.**

*Carex atrata* L. subsp. *atrata* / karasaparna.

Subalpine meadows, 2050 m, 12.08.2017, HB 1870a

Euro-Sib (mt), Crp.

*C. digitata* L. / parmaksaz.

Meadows, 2100 m, 22.07.2016, HB 1541

Eux, Crp.

*C. echinata* Murray subsp. *echinata* / küt ayakotu.

Marshy meadows, 2100 m, 14.07.2017, HB 1828

Euro-Sib, Crp.

*C. nigra* (L.) Reichard subsp. *dacica* (Heuffel) Soo / rumen ayakotu.

Marshy pastures, 2150 m, 27.07.2017, HB 1851

Eux, Crp.

*C. nigra* (L.) Reichard. subsp. *nigra* / kara ayakotu.

Marshy pastures, 2200 m, 22.07.2016, HB 1591

Crp.

*C. oligantha* Steudel / garipsaz.

Damp meadows, 2350 m, 14.07.2017, HB 1823

DD, Hyrc-Eux, Crp.

*C. panicea* L. / dari ayakotu.

Streamsides, 2300 m, 06.08.2016, HB 1662

Crp.

*C. sylvatica* Huds. subsp. *latifrons* (V.I.Krecz) Ö.Nilsson / enlisaz.

Damp meadows, 1900 m, 20.08.2016, HB 1711b

Eux, Crp.

*Cyperus glaber* L. / könuotu.

Streamsides, 1700 m, 05.09.2016, HB 1745

Crp.

*Pycnus flavescens* (L.) P. Beauv. & Rchb. / samanberdi.

Streamsides, 1600 m, 05.09.2016, HB 1753

Crp.

#### **Ericaceae / Fundagiller**

*Epigaea gaultherioides* (Boiss. & Balansa) Takht. / dağelması.

Among *Vaccinium* sp. and *Rhododendron* sp. communities, 2200 m, 16.06.2017, HB 1792

Eux, Php.

*Pyrola minor* L. / emrudotu.

Damp meadows, 2250 m, 07.07.2016, HB 1489

Euro-Sib, Hcrp.

*Rhododendron luteum* Sweet / zifin.

Subalpine slopes, 1800 m, 23.06.2016, HB 1361

Eux, Php.

*R. ponticum* L. / kumar.

Edge of *Piceae* forest, 1800 m, 23.06.2016, HB 1345

Eux, Php.

*R. smirnovii* Trautv. / kızıl kumar.

Under *Piceae* forest, 1900 m, 28.06.2017, HB 1801

Eux, Php.

*V. arctostaphylos* L. / likarpa.

Edge of forests, 1700 m, 14.07.2017, HB 1827

Eux, Php.

*Vaccinium myrtillus* L. / ayüzümü.

Alpine meadows, 2500 m, 22.07.2016, HB 1590

Euro-Sib, Chp.

*V. uliginosum* L. / avcüzümü.

Alpine meadows, 2600 m, 20.08.2016, HB 1700

Eux, Chp.

#### **Euphorbiaceae / Sütlegengiller.**

*Euphorbia djimilensis* Boiss. / cimil sütlegeni.

Alpine meadows, 2350 m, 06.08.2016, HB 1650

Endemic, NT, Eux, Hcrp.

*E. squamosa* Willd. / hemşin sütlegeni.

Stony slopes, 1660 m, 08.06.2016, HB 1229

Hyrç-Eux, Hcrp.

*Mercurialis annua* L. / parşen.

Screes, 1600 m, 07.07.2016, HB 1466

Thp.

*M. ovata* Sternb. & Hoppe / ağcaotu.

1700 m, 23.06.2016, HB 1351

Euro-Sib, Hcrp.

#### **Fabaceae / Baklagiller**

*Astragalus falcatus* Lam. / orak geveni.

Meadows, 2150 m, 06.08.2016, HB 1641

Eux (mt), Hcrp.

*A. fragrans* Willd. / mis geveni.

Alpine meadows, 230 m, 22.07.2016, HB 1537

Ir-Tur, Hcrp.

*A. frickii* Bunge / artvin geveni.

Alpine meadows, 2700 m, 22.07.2016, HB 1581

Eux (mt), Hcrp.

*A. glycyphyllos* L. / dev geveni.

Meadows, 1900 m, 20.08.2016, HB 1689

Euro-Sib, Hcrp.

*A. incerus* Ledeb. / koçtaşağı.

Screes, 2700 m, 27.07.2017, HB 1848

Ir-Tur, Hcrp.

*Lathyrus aureus* (Steven) D. Brandza / koru mürdümüğü.

Under shrubs, 1900 m, 07.07.2016, HB 1448

Eux, Hcrp.

*L. pratensis* L. / yılan gürülü.

Streamside, 1900 m, 14.07.2017, HB 1821

Euro-Sib, Hcrp.

*L. roseus* Steven subsp. *roseus* / gül mürdümüğü.

Under shrubs, 1700 m, 07.07.2016, HB 1482

Hyrç-Eux, Hcrp.

*Lotus corniculatus* L. var. *corniculatus* / gazalboynuzu.

Meadows, 2400 m, 22.07.2016, HB 1566

Hcrp.

*Medicago falcata* L. / kart yonca.

Meadows, 2000m, 06.08.2016, HB 1659

Crp.

*M. lupulina* L. / bitçikotu.

Meadows, 1900 m, 07.07.2016, HB 1465

Crp.

*Melilotus officinalis* (L.) Desr. / kokulu yonca.

Roadsides, 1750 m, 28.08.2017, HB 1873

Hcrp.

*Securigera orientalis* (Mill.) Lassen subsp. *balansae* (Boiss.)

Keskin / hoş körişen.

Alpine meadows, 2400 m, 07.07.2016, HB 1449

Hcrp.

*S. varia* (L.) Lassen subsp. *varia* / körişen.

Near screes, 2100 m, 12.08.2017, HB 1865

Medit, Hcrp.

*Trifolium ambiguum* M. Bieb. / pisikulağı.

Alpine meadow, 2500m, 06.08.2016, HB 1644  
Hcrp.

*T. aureum* Pollich subsp. *aureum* / altuni üçgül.  
Rocky slopes, 2100 m, 27.07.2017, HB 1855  
Euro-Sib, Thp.

*T. campestre* Schreb. / üçgül.  
Meadows, 2050 m, 08.06.2016, HB 1236  
Thp.

*T. canescens* Willd. / sarı üçgül.  
Meadows, 1900 m, 22.07.2016, HB 1572  
Hycr-Eux, Hcrp.

*T. pratense* L. var. *pratense* / çayır üçgülü.  
Meadows, 2100 m, 05.09.2016, HB 1740  
Hcrp.

*T. repens* L. var. *repens* / ak üçgül.  
Pastures, 2400 m, 20.08.2016, HB 1696  
Hcrp.

*T. spadicum* L. / çayır dutu.  
Damp meadows, 2100 m, 14.07.2017, HB 1831  
Euro-Sib, Hcrp.

*Vicia cracca* L. subsp. *cracca* / kuş fiği.  
Damp meadows, 2200 m, 06.08.2016, HB 1673  
Euro-Sib, Hcrp.

*V. sativa* L. subsp. *incisa* (Bieb) Arc. / ekin fiği.  
Rock surfaces, 1700 m, 16.06.2017, HB 1794  
Thp.

*V. sativa* L. subsp. *nigra* (L.) Ehrh. / eşek gürlüğü.  
Screes, 1800 m, 08.06.2016, HB 1231  
Thp.

*V. sepium* L. / dere baklası.  
Among *Rhododendron* sp., 1800 m, 07.07.2016, HB 1459  
Euro-Sib, Hcrp.

*V. villosa* Roth subsp. *villosa* / tüylü fiğ.  
Damp meadows, 1650 m, 23.06.2016, HB 1321  
Hcrp.

#### **Fagaceae / Kayıngiller**

*Castanea sativa* Mill. / kestane.  
Mixed forests, 1550 m, 07.07.2016, HB 1479  
Euro-Sib, Php.

*Fagus orientalis* Lipsky / kayın.  
Mixed forests, 1800 m, 24.05.2016, HB 1164  
Euro-Sib, Php.

*Quercus pontica* K.Koch. / yayla peliti.  
Mixed forests, 2000 m, 20.08.2016, HB 1705  
Eux, Php.

#### **Gentianaceae / Gentiyangiller**

*Centaureum erythraea* Rafn. subsp. *turcicum* (Velen.)  
Melderis / tukulotu.  
Meadows, 2150 m, 28.06.2017, HB 1817  
Euro-Sib, Hcrp.

*Gentiana aquatica* L. / su gentiyanı  
Alpine meadows, 2900 m, 06.08.2016, HB 1614  
Thp.

*G. asclepiadea* L. / sütlü güşad.  
Meadows, 1900 m, 20.09.2016, HB 1770  
Euro-Sib, Hcrp.

*G. gelida* M. Bieb. / dağ gentiyanı.  
Pastures, 2600 m, 20.09.2016, HB 1771  
Eux, Hcrp.

*G. pyrenaica* L. / pir gentiyanı.  
Alpine meadows, 2550, 20.08.2016, HB 1694  
Euro-Sib, Hcrp.

*Swertia iberica* Fisch ex C.A. Mey. / safraca.  
Damp streamsides, 2300 m, 06.08.2016, HB 1637  
LR (lc), Eux (mt), Hcrp.

#### **Geraniaceae / Turnagagasigiller**

*Geranium subacutum* (Boiss.) Aedo. / hoş ıtır.  
Screes, 2600 m, 20.08.2016, HB 1702  
Endemic, EN, Ir-Tur, Crp.

*G. platypetalum* Fisch & C. A. Mey. / kuru ıtırı.  
Under shrubs, 1750 m, 23.06.2016, HB 1339  
Hycr-Eux, Crp.

*G. psilostemon* Ledeb. / zarif ıtır.  
Meadows, 2100 m, 22.07.2016, HB 1574  
Eux (mt), Crp.

*G. purpureum* Vill. / ebedön.  
Damp meadows, 1800 m, 24.05.2016, HB 1159  
Thp.

*G. pyrenaicum* Burm. / gelinçarşafı.  
Streamsides, 2100 m, 07.07.2016, HB 1472  
Crp.

*G. rotundifolium* L. / helilok.  
Screes, 1750 m, 20.05.2017, HB 1785  
Thp.

#### **Hypericaceae / Kantarongiller**

*Hypericum hirsutum* L. / tüylü kantaron.  
Streamsides, 1950 m, 06.08.2016, HB 1618  
Euro-Sib, Hcrp.

*H. orientale* L. / sandık çiçeği.  
Meadow slopes, 2100 m, 14.07.2017, HB 1826  
Eux, Hcrp.

*H. perforatum* L. / kantaron.  
Meadows, 2000 m, 07.07.2016, HB 1452  
Hcrp.

#### **Iridaceae / Süsengiller**

*Crocus scharojanii* Rupr. / yaylakovan.  
Alpine meadows, 2400 m, 06.08.2016, HB 1671  
VU, Eux, Crp.

*C. vallicola* Herb. / hozmancuk.  
Subalpine meadows, 2100 m, 20.09.2016, HB 1765  
Eux, Crp.

#### **Juncaceae / Kofagiller**

*Juncus articulatus* L. subsp. *articulatus* / camışotu.  
Streamsides, 2300 m, 08.06.2016, HB 1240  
Euro-Sib, Hcrp.

*J. effusus* L. subsp. *effusus* / has kofa.  
Damp meadows, 1800 m, 07.07.2016, HB 1481  
Cosm, Hcrp.

*J. tenageia* Ehrh. ex L. subsp. *tenageia* / kum kofası.  
Damp meadows, 1800 m, 23.06.2016, HB 1356  
Euro-Sib, Hcrp.

*Luzula pallescens* Sw. / çayır luzulu.  
Meadows, 1650 m, 23.06.2016, HB 1332  
Euro-Sib, Hcrp.

#### **Lamiaceae / Ballıbabagiller**

*Ajuga reptans* L. / meryemsaçı  
Meadows, 1650 m, 23.06.2016, HB 1319  
Euro-Sib, Crp.

*Ballota nigra* L. subsp. *nigra* / yalancı ısırgan.  
Among shrubs, 1700 m, 07.07.2016, HB 1464  
Euro-Sib, Hcrp.

*Clinopodium grandiflorum* (L.) Kuntze / kaba fesleğen.  
Damp stony surfaces, 2100 m, 05.09.2016, HB 1739  
Euro-Sib, Hcrp.

*C. vulgare* L. subsp. *vulgare* / yabani fesleğen.  
Screes, 2400 m, 22.07.2016, HB 1586  
Hcrp.

*Lamium album* L. subsp. *album* / balıçak.  
Stony meadows, 2300 m, 14.07.2017, HB 1825  
Euro-Sib, Hcrp.

*L. album* L. subsp. *crinitum* (Montbret & Aucher ex Beth.)  
Mennema / kovanlık.  
Meadows among screes, 2350 m, 22.07.2016, HB 1539



Eux, Hcrp.

*L. moschatum* Miller subsp. *micranthum* (Boiss.) Mennema / mis balıçak.

Meadows, 1650 m, 16.06.2017, HB 1795  
Hcrp.

*L. purpureum* L. var. *purpureum* / ballıbaba.  
Streamsides, 1700 m, 08.06.2016, HB 1233  
Euro-Sib, Hcrp.

*Melissa officinalis* L. subsp. *officinalis* / oğulotu.  
Forest clearings, 1750 m, 23.06.2016, HB 1340  
Medit, Hcrp.

*Mentha longifolia* (L.) L. subsp. *longifolia* / punk.  
Streamsides, 2100 m, 22.07.2016, HB 1589  
LR (1c), Eux, Crp.

*Nepeta nuda* L. subsp. *albiflora* (Boiss.) Gams / karaküncü.  
Alpine meadows, 2550 m, 07.07.2016, HB 1462  
Chp.

*Origanum vulgare* L. subsp. *viridulum* (Martin-Donos)  
Nyman / istanbul kekiği.  
Roadsides, 1700 m, 22.07.2016, HB 1595  
Hcrp.

*Prunella vulgaris* L. / gelinciklemeotu.  
Streamsides, 2650 m, 05.09.2016, HB 1736  
Euro-Sib, Hcrp.

*Salvia glutinosa* L. / oklu şalba.  
Damp shrub communities, 1700 m, 07.07.2016, HB 1456  
Hycr-Eux, Hcrp.

*S. verticillata* L. subsp. *verticilla* / dadırak.  
Stony meadows, 2150 m, 14.07.2017, HB 1834  
Euro-Sib, Hcrp.

*Stachys macrantha* (K.Koch.) Stearn. / koca soğulcan.  
Alpine meadows, 2750 m, 05.09.2016, HB 1744  
Eux, Hcrp.

*S. sylvatica* L. / hamısrıgan.  
Screes, 2350 m, 20.08.2016, HB 1719  
Crp.

*Teucrium chamaedrys* L. subsp. *trapezunticum* Rech. / dalakotu.  
Screes, 1630 m, 14.07.2017, HB 1840  
Euro-Sib, Chp.

*Thymus longicaulis* C. Presl subsp. *longicaulis* / aş kekiği.  
Pastures, 2100 m, , 07.07.2016, HB 1473  
Euro-Sib, Chp.

*Ziziphora clinopodioides* Lam. / dağ reyhanı.  
Rocky slopes, 2300 m, 05.09.2016, HB 1750  
Ir-Tur, Hcrp.

#### **Liliaceae / Zambakgiller**

*Fritillaria latifolia* Willd. / yayla lalesi.  
Alpine meadows, 2500m, 23.06.2016, HB 1346  
Eux (mt), Crp.

*Gagea glacialis* K.Koch. / buz yıldızı.  
Alpine meadows, 2600 m, 08.06.2016, HB 1238  
Ir-Tur, Crp.

#### **Melanthiaceae / Dokuztepegiller**

*Paris incompleta* M. Bieb. / tilkiüzümü.  
Damp slopes, 1800 m, 24.05.2016, HB 1168  
Crp.

*Veratrum album* L. / dokuztepedi.  
Damp slopes, 1800 m, 20.08.2016, HB 1712  
Euro-Sib, Crp.

#### **Oleaceae / Zeytingiller**

*Osmanthus decorus* (Boiss. & Balansa) Kasaplıgil / poci.  
Mixed forest, 1650 m, 08.06.2016, HB 1241  
Eux, Php.

#### **Onagraceae / Yakıotugiller**

*Epilobium angustifolium* L. / yakıotu.  
Streamsides, 2200 m, 06.08.2016, HB 1663

Crp.

*E.ponticum* Hausskn. / garapil.  
Streamsides, 2900 m, 05.09.2016, HB 1755  
Crp.

#### **Orchidaceae / Salepgiller**

*Cephalanthera longifolia* (L.) Fritsch. / kuğu salebi.  
Edge of *Piceae orientalis* forest, 20.05.2017, 1800 m, HB 1788

Euro-Sib, Crp.  
*Dactylorhiza euxina* (Nevski) H. Baumann & Künkele var. *euxina* / laz salebi.  
Damp meadows, 2350 m, 28.06.2017, HB 1807

NT, Eux, Crp.  
*D. urvilleana* (Steudal) Baumen & Künkele subsp. *urvilleana* / balkaymak.  
Streamsides, 2200 m, 23.06.2016, HB 1354  
Eux, Crp.

*Listera ovata* (L.) R. Br. / çalı salebi.  
Meadows, 1750 m, 08.06.2016, HB 1235  
Euro-Sib, Crp.

*Orchis palustris* Jacq. / çayır salebi.  
Damp meadows, 1850 m, 16.06.2017, HB 1793  
Crp.

*Patanthera chlorantha* (Custer) Rchb. / çarpık salep.  
Edge of forests, 1800 m, 28.06.2017, HB 1805  
Crp.

#### **Orobanchaceae / Canavarotugiller**

*Euphrasia lebardensis* Kem.-Nath. / yamaç gözotu.  
Stony meadows, 2550 m, 06.08.2016, HB 1642  
Eux (mt),Thp.

*E. minima* Jacq. ex DC. subsp. *davisi* Yeo / gözlükkıran.  
Alpine meadows, 2650 m, 05.09.2016, HB 1742  
Endemic, LR(1c), Eux, Thp.

*Melampyrum arvense* L. var. *arvense* / inek buğdayı.  
Stony slopes, 2000 m, 20.08.2016, HB 1715  
Euro-Sib, Thp.

*Orobanche caesia* Rchb. / mavi veremotu.  
Parasite on *Telekia speciosa*, 1700 m, 28.06.2017, HB 1802  
Vp.

*Pedicularis caucasica* M. Bieb. / keşgerotu.  
Alpine meadows, 2500 m, 06.08.2016, HB 1632  
Hycr-Eux, Hcrp.

*P. condensata* M. Bieb. / kırık bitotu.  
Alpine meadows, 2600 m, 20.08.2016, HB 1704  
Eux, Hcrp.

*P. pontica* Boiss. / şimal bitotu.  
Alpine meadows, 2650 m, 06.08.2016, HB 1648  
Eux, Hcrp.

*Rhinanthus angustifolius* C. C. Gmel. subsp. *grandifolius* (Wallr.) D. A. Webb. / horozotu.  
Meadows, 2100m, 07.07.2016, HB 1470  
Thp.

*Rhynchocorys elephas* (L.) Griseb. subsp. *elephas* / filburnu.  
Meadows, 2300 m, 22.07.2016, HB 1552  
Euro-Sib, Hcrp.

#### **Papaveraceae / Haşhaşgiller**

*Chelidonium majus* L. / kırılangoçotu.  
Under forest, 1600 m, 27.07.2017, HB 1845  
Euro-Sib, Hcrp.

*Corydalis alpestris* C.A. Mey. / gök kazgagası.  
Rocky slopes, 2100 m, 22.07.2016, HB 1583  
Eux, Crp.

*Fumaria schleicheri* Soy.-Will. subsp. *microcarpa* (Hausskn.) Liden / şetere  
Screes, 1700 m, 06.08.2016, HB 1652  
Thp.

*Papaver dubium* L. subsp. *dubium* / köpekyacağı.

Roadsides, 1500 m, 23.06.2016, HB 1334  
Thp.

*P. lateritium* K. Koch subsp. *lateritium* / potot.  
Screes, 2000 m, 06.08.2016, HB 1657  
Endemic, VU, Eux, Hcrp.

#### **Plantaginaceae / Sinirotugiller**

*Digitalis ferruginea* L. subsp. *ferruginea* / arıkovanı.  
Rocky alpine meadows, 2400 m, 20.08.2016, HB 1707  
Euro-Sib, Hcrp.

*Linaria simplex* DC. / yalın nevrüzotu.  
Stony slopes, 1700 m, 28.06.2017, HB 1812  
Medit, Hcrp.

*P. lanceolata* L. / damarlıca.  
Streamsides, 1500 m, 23.06.2016, HB 1335  
Hcrp.

*Plantago major* L. subsp. *major* / sinirotu.  
Roadsides, 2100 m, 06.08.2016, HB 1619  
Hcrp.

*Veronica anagallis-aquatica* L. / sugedemesi.  
Streamsides, 1700 m, 22.07.2016, HB 1556  
LR (lc), Hcrp.

*V. biloba* Schreber. / çift maviş.  
Meadows among screes, 2000 m, 28.06.2017, HB 1818  
Ir-Tur, Thp.

*V. chamaedrys* L. / cancan.  
Under shrubs, 1700 m, 23.06.2016, HB 1337  
Euro-Sib, Crp.

#### **Poaceae / Buğdaygiller**

*Agrostis stolonifera* L. / tavusotu.  
Damp meadows, 1700 m, 22.07.2016, HB 1594  
Euro-Sib, Crp.

*Alopecurus arundinaceus* Poir. / karnış tilkikuyruğu.  
Roadsides, 2000 m, 06.08.2016, HB 1623  
LR (lc), Euro-Sib, Crp.

*A. lagroides* Balansa / kar tilkikuyruğu.  
Reefy slopes, 2600, 20.08.2016, HB 1708  
Endemic, LR (lc), Euro-Sib(mt), Crp.

*Brachypodium sylvaticum* (Huds.) P.Beauv. / kuru kılcanı.  
Rocky slopes, 2300 m, 05.09.2016, HB 1747  
Euro-Sib, Crp.

*Briza marcoviczii* Woronow / çingirdak.  
Alpine meadows, 2400 m, 06.08.2016, HB 1617  
Thp.

*Bromus danthoniae* Trin. subsp. *Danthoniae* / ibubukotu.  
Screes, 2200 m, 23.06.2016, HB 1357  
Thp.

*B. japonicus* Thunb. subsp. *japonicus* / iyeotu.  
Meadows, 1800 m, 28.06.2017, HB 1813  
Thp.

*B. scoparius* L. / ibubuk ekini.  
Meadows, 2000 m, 14.07.2017, HB 1830  
Crp.

*Calamagrostis arundinacea* (L.) Roth. / kandıraotu.  
Close to *Rhododendron* sp. shrubs, 1700 m, 06.08.2016, HB 1656  
Euro-Sib, Crp.

*Cynosurus cristatus* L. / tarakotu.  
Damp meadows, 2200 m, 12.10.2016, HB 1780  
Euro-Sib, Hcrp.

*Dactylis glomerata* L. subsp. *glomerata* / domuzayrığı.  
Meadows, 2100 m, 07.07.2016, HB 1488  
Euro-Sib, Crp.

*Elymus lazicus* (Boiss.) Melderis / yayla buğdayı.  
Rocky meadows, 1600 m, 05.09.2016, HB 1758  
Endemic, VU, Eux, Hcrp.

*Festuca anatolica* Markgr.-Dann. subsp. *anatolica* / yurt yumağı.

Stony meadows, 2100 m, 20.08.2016, HB 1714  
Endemic, LC, Chp.

*F. cyllenica* Boiss & Heldr. subsp. *uluana* Markgr.-Dann. / ulu yumak.

Subalpine meadows, 1750 m, 14.07.2017, HB 1836  
Endemic, Eux, Chp.

*F. woronowi* Hack. subsp. *woronowi* / yayla yumağı.  
Meadows, 2300 m, 22.07.2016, HB 1587  
VU, Eux (mt), Chp.

*Glyceria notata* Cheval. / kıvrık tatlıçim.  
Meadows close to streams, 2100 m, 20.09.2016, HB 1767  
Hcrp.

*Helictotrichon planiculme* (Schrader) Pilg. / cimil yulafi.  
Rocky slopes, 2300 m, 05.09.2016, HB 1752  
Eux, Crp.

*Koeleria macrantha* (Lebed) Schult. / koca kiral.  
Screes, 2100 m, 23.06.2016, HB 1326  
Hcrp.

*Lolium perenne* L. / çim.  
Pastures, 1900 m, 06.08.2016, HB 1660  
Euro-Sib, Hcrp.

*Melica uniflora* Retz. / seyrek inciotu.  
Rocky slopes, 1600 m, 05.09.2016, HB 1754  
Euro-Sib, Crp.

*Nardus stricta* L. / kılolu.  
Alpine meadows, 2400m, 20.09.2016, HB 1769  
Euro-Sib, Hcrp.

*Phleum phleoides* (L.) Karsten / bayır itkuyruğu.  
Pastures, 2100 m, 20.09.2016, HB 1766  
Euro-Sib, Hcrp.

*P. pratense* L. / çayır itkuyruğu.  
Damp meadows, 2450 m, 06.08.2016, HB 1654  
Euro-Sib, Chp.

*Poa alpina* L. subsp. *fallax* F. Herm. / yayla salkımotu.  
Alpine slopes, 2000 m, 20.08.2016, HB 1706  
Chp.

*P. angustifolia* L. / dar salkımotu.  
Pastures, 2250 m, 12.10.2016, HB 1783  
LR (lc), Chp.

*P. annua* L. / salkımotu.  
Damp meadows, 1900 m, 28.06.2017, HB 1808  
Thp.

*P. bulbosa* L. / yumrulu salkımotu.  
Pastures, 2300 m, 08.06.2016, HB 1244  
Crp.

*P. longifolia* Trin. / ipek salkımotu.  
Alpine meadows, 2400 m, 14.07.2017, HB 1832  
Eux, Crp.

*P. nemoralis* L. / orman salkımı.  
Pastures, 2300 m, 22.07.2016, HB 1532  
Crp.

*P. pratensis* L. çayır salkımı.  
Alpine meadows, 2500 m, 06.08.2016, HB 1658  
Chp.

*Stipa pontica* P. A. Smirn / körpe kılaç.  
Mountain slopes, 2400 m, 23.06.2016, HB 1328

**Polygalaceae / Sütotugiller**  
*Polygala alpestris* Rchb. / yayla sütotu.  
Pastures, 1900 m, 07.07.2016, HB 1455  
Euro-Sib, Hcrp.

*P. major* Jacq. / koca sütotu.  
Rocky slopes, 1900 m, 06.08.2016, HB 1630  
Euro-Sib, Hcrp.

*P. supina* Schreb. subsp. *supina* / gihaye sipirge.  
Pastures, 2350 m, 27.07.2017, HB 1858  
Cosmopolite, Hcrp.

*P. vulgaris* L. / sütotu.

Meadows, 1700 m, 28.06.2017, HB 1815  
Euro-Sib, Hcrp.

#### **Polygonaceae / Madımakgiller**

*Polygonum alpinum* All. / eleyaz.  
Screes, 2300 m, 06.08.2016, HB 1639

Euro-Sib, Hcrp.

*P. arenastrum* Boreau / bezmeceotu.

Arid slopes, 2300 m, 12.10.2016, HB 1782

Thp.

*P. bistorta* L. subsp. *carneum* (K. Koch) Coode & Cullen / dađlahanası.

Damp meadows, 22450 m, 22.07.2016, HB 1538

Eux(mt), Hcrp.

*P. cognatum* Meissn. / madımak.

Alpine meadows, 2500 m, 20.09.2016, HB 1768

Ir-Tur, Hcrp.

*Rumex acetosella* L. / kuzukulađı.

Arid slopes, 2250 m, 06.08.2016, HB 1647

Cosmopolite, Hcrp.

*R. alpinus* L. / řortah.

Streamsides, 2300 m, 07.07.2016, HB 1457

Crp.

*R. caucasicus* Rech. / tiriřov.

Alpine slopes, 2800 m, 20.08.2016, HB 1692

Eux (mt), Hcrp.

*R. crispus* L. / labada.

Bog, 2150 m, 23.06.2016, HB 1331

Cosmopolite, Chp.

*R. scutatus* L. / ekřimen.

Screes, 2250 m, 22.07.2016, HB 1551

Chp.

#### **Primulaceae / Çuhaçiçeđigiller**

*Androsace albana* Steven / arınca.

Meadows, 01900 m, 07.07.2016, HB 1477

Hycr-Eux(mt), Hcrp.

*Cyclamen coum* Mill var. *coum* / yersomunu.

Forest, 1700 m, 24.05.2016, HB 1172

Crp.

*C. parviflorum* Pobed. / filiski.

Stony meadows, 08.06.2016, 1900 m, HB 1234

Endemic, LR (lc), Eux (mt), Crp.

*Primula algida* Adams / dađtutyası.

Damp meadows, 2800 m, 06.08.2016, HB 1640

Hcrp.

*P. acaulis* (L.) L. Huds. subsp. *rubra* (Sm)Greuter & Burdet / evvvelbahar çiçeđi

Damp slopes, 2000 m, 23.06.2016, HB 1352

Eux, Hcrp.

*P. auriculata* Lam. / felçotu.

Streamsides, 2400 m, 22.07.2016, HB 1600

Ir-Tur, LR (lc), Hcrp.

*P. elatior* (L.) L. subsp. *amoena* (Bieb.) Greuter & Burdet / yaylatutyası.

Streamsides, 2300 m, 07.07.2016, HB 1468

Euro-Sib, Hcrp.

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

Alpine meadows, 2600 m, 22.07.2016, HB 1580

Eux, Hcrp.

*P. longipes* Freyn & Sint. / zarif çuha.

Small streamsides, 2700 m, 20.08.2016, HB 1698

Endemic, LR (nt). Eux, Hcrp.

*P. megaseifolia* Boiss. & Balansa / martçiçeđi.

Edge of Shrub communities, 1700 m, 24.05.2016, HB 1163,

VU, Eux, Hcrp.

#### **Ranunculaceae / Dügünçiçeđigiller**

*Aconitum orientale* Mill. / kurtođlan.

Meadows, 2100 m, 05.09.2016, HB 1743  
Eux, Hcrp.

*Adonis aestivalis* L. subsp. *aestivalis* / kandamlası.

Pastures, 1600 m, 14.07.2017, HB 1829

Thp.

*Anemone narcissiflora* L. subsp. *narcissiflora* / mayısçiçeđi.

Damp slopes, 1900 m, 23.06.2016, HB 1359

Euro-Sib, Hcrp.

*Aquilegia olympica* Boiss. / hasekiküpesi.

Damp meadows, 1750 m, 22.07.2016, HB 1533

Hcrp.

*Caltha palustris* L. / lilpar.

Streamsides, 1800 m, 07.07.2016, HB 1469

LR (lc), Hcrp.

*Consolida orientalis* (J. Gay.) Schrodinger / morçiçek.

Besides, small gardens, 1700 m, 22.07.2016, HB 1549

Ir-Tur, Thp.

*Delphinium flexuosum* M.Bieb. var. *buschianum* (Grossh.)

Parsa. / eđri hazaren.

Screes, 2000 m, 22.07.2016, HB 1569

Eux, Hcrp.

*D. formosum* Boiss. & A. Huet / gür hezaren.

Streamsides, 1900 m, 06.08.2016, HB 1616

Endemic, LC, Eux, Hcrp.

*Ranunculus arvensis* L. / mustafaçiçeđi.

Close to small gardens, 1700 m, 28.06.2017, HB 1816

Thp.

*R. buhsei* Boiss. / çingotu.

Rocky slopes, 1900 m, 06.08.2016, HB 1657

Hycr-Eux (mt), Crp.

*R. constantinopolitanus* (DC.) d'Urv. / kađıthane çiçeđi.

Damp meadows, 1800 m, 23.06.2016, HB 1341

Hcrp.

*R. dissectus* M. Bieb. subsp. *huetii* P.H.Davis / kaya kebikeci.

Pastures, 2100 m, 22.07.2016, HB 1535

Endemic, LC, Crp.

*R. grandiflorus* L. / katırmalı.

Damp meadows, 2000 m, 07.07.2016, HB 1487

Hcrp.

*R. repens* L. / tiktakdana.

Damp places, 2000 m, 22.07.2016, HB 1596

Hcrp.

*Thalictrum foetidum* L. / delialan maydonozu.

Screes, 1850 m, 06.08.2016, HB 1670

Euro-Sib, Hcrp.

*T. minus* L. var. *minus* / kaytaran.

Damp meadows, 2050 m, 22.07.2016, HB 1579

Euro-Sib, Hcrp.

*Trollius ranunculinus* (Sm.) Stearn. / zarif çünkotu.

Damp places, 2100 m, 23.06.2016, HB 1323

Hcrp.

#### **Rhamnaceae / Cehrigiller**

*Frangula dodonei* Ard. subsp. *dodonei* / barutađacı.

Mixed forest, 1650 m, 24.05.2016, HB 1156

Euro-Sib, Php.

#### **Rosaceae / Gülgiller**

*Alchemilla caucasica* Buser / kaf řebnemlisi.

Alpine meadows, 2300 m, 22.07.2016, HB 1571

Eux (mt), Crp.

*A. retinervis* Buser / damarlı kelkat.

Among roks at pastures, 12.08.2017, HB 1870b

Eux (mt), Crp.

*A. rizensis* B. Pawl. / rize kelkati.

Rocky slopes, 2800 m, 20.08.2016, HB 1697

Endemic, Eux (mt), Crp.

*A. sericea* Willd. / akpençe.

Rocky slopes, 2500 m, 06.08.2016, HB 1634

Eux (mt), Crp.

*Aruncus vulgaris* (Maxim.) Raf ex H. Hara / hoşkeçisakalı.  
Streamsides on rocky surfaces, 1650 m, 07.07.2016, HB 1467  
Euro-Sib, Hcrp.

*Filipendula ulmaria* (L.) Maxim. / çayırkraliçesi.  
Roadsides, 1650 m, 14.07.2017, HB 1838  
Euro-Sib, Hcrp.

*Fragaria vesca* L. / dağ çileği.  
Damp places at pastures, 2250 m, 23.06.2016, HB 1338  
Euro-Sib, Hcrp.

*Geum urbanum* L. / meryemotu.  
Streamsides, 1750 m, 07.07.2016, HB 1486  
Euro-Sib, Crp.

*Laurocerasus officinalis* Roemer. / karayemiş.  
Forest, 1700 m, 28.06.2017, HB 1810  
Php.

*Padus avium* Mill. / kuş kirazı.  
Screes, 1900 m, 23.06.2016, HB 1318  
Php.

*Potentilla crantzii* (Crantz.) Fritsch / beşparmakotu.  
Alpine slopes, 2900 m, 20.09.2016, HB 1764  
Euro-Sib, Hcrp.

*P. elatior* Wild ex Schlecht / ak parmakotu.  
Damp meadows, 2000 m, 20.08.2016, HB 1691  
Eux, Hcrp.

*P. erecta* (L.) Rauschel. / kurtpençesi.  
Damp meadows, 2150 m, 06.08.2016, HB 1655  
Eux, Crp.

*P. ruprechtii* Boiss. / mis parmakotu.  
Pastures, 2300 m, 06.08.2016, HB 1625  
Chp.

*Rubus hirtus* Waldst. & Kit. / tüntürük.  
Mixed forest, 1700 m, 28.06.2017, HB 1803  
Euro-Sib, Chp.

*R. idaeus* L. subsp. *idaeus* / ahududu.  
Forest clearings, 1800 m, 07.07.2016, HB 1463  
Php.

*R. saxatilis* L. / köslek.  
Meadows, 1900 m, 23.06.2016, HB 1343  
Hcrp.

*Sibbaldia parviflora* Willd. var. *parviflora* / findikotu.  
Pastures, 2300 m, 22.07.2016, HB 1560  
Chp.

*Sorbus aucuparia* L. / kuş üvezi.  
Close to forest, 1700 m, 23.06.2016, HB 1327  
Euro-Sib, Php.

#### **Rubiaceae / Kökboyagiller**

*Asperula taurina* L. / küçük fevve.  
Meadows, 2000 m, 06.08.2016, HB 1638  
Hyc-Eux, Crp.

*Crucianella gilanica* Trin. subsp. *pontica* (Ehrend.) Ehrend. / köse haçotu.  
Crevices, 1650 m, 28.06.2017, HB 1814  
Eux, Crp.

*Cruciata laevipes* Opiz / sarılıkotu.  
Pastures, 2550 m, 22.07.2016, HB 1585  
Euro-Sib, Hcrp.

*C. taurica* (Pallas ex Willd.) Ehrend. / kırım güzeli.  
Screes, 2900 m, 22.07.2016, HB 1562  
Ir-Tur, Chp.

*Galium album* Mill. subsp. *prusense* (K. Koch.) Ehrend et  
Krendl / bursa iplikçığı.  
Meadows, 2300 m, 06.08.2016, HB 1646  
Hcrp.

*G. odoratum* (L.) Scop. / orman iplikçığı.  
Forest, 1750 m, 22.07.2016, HB 1553  
Euro-Sib, Hcrp.

*G. spurium* L. subsp. *spurium* / arsız iplikçik.  
Screes, 2100 m, 23.06.2016, HB 1324  
Euro-Sib, Thp.

*G. verum* L. subsp. *verum* / boyalık.  
Stream beds, 2200 m, 06.08.2016, HB 1631  
Euro-Sib, Hcrp.

#### **Salicaceae / Söğütgiller**

*Populus tremula* L. subsp. *tremula* / titrek kavak.  
Mixed forests, 2000 m, 24.05.2016, HB 1158  
Euro-Sib, Php.

*Salix caprea* L. / sorgun.  
Streamsides, 2150 m, 24.05.2016, HB 1157  
Euro-Sib, Php.

#### **Sapindaceae / Akçaağaçgiller**

*Acer heldreichii* Orp. ex Boiss subsp. *trautvetteri* (Medw.)  
A.E. Murray / karkas akçaağacı.  
Mixed forest, 1650 m, 24.05.2016, HB 1170  
Eux, Php.

*A. platanoides* L. / çınar akçaağacı.  
Mixed forest, 1700 m, 20.05.2017, HB 1786  
Euro-Sib, Php.

#### **Scrophulariaceae / Sıracaoğutgiller**

*Scrophularia kotschyana* Benth. / darbeotu.  
Shady screes, 2300 m, 22.07.2016, HB 1554  
Hcrp.

*S. nodosa* L. / tavuk sıracası.  
Stony meadows, 2050 m, 22.07.2016, HB 1582  
Euro-Sib, Hcrp.

*S. scopoli* Hoppe ex Pers. var. *adenocalyx* Sommier &  
Levier / elköpürten.  
Stony streamsides, 2000 m, 14.07.2017, HB 1833  
Eux, Hcrp.

*Verbascum gnaphalodes* M. Bieb. / uslu sığırkuyruğu.  
Damp places, 2150 m, 27.07.2017, HB 1850  
Eux, Hcrp.

*V. thapsus* L. / burunca.  
Streamsides, 1650 m, 22.07.2016, HB 1599  
Euro-Sib, Hcrp.

#### **Solanaceae / Patlıcanlıgiller**

*Atropa belladonna* L. / güzelavratotu.  
Shady paces, 1700 m, 23.06.2016, HB 1322  
Euro-Sib, Hcrp.

*Solanum nigrum* L. / itüzümü  
Roadsides, 1650 m, 12.10.2016, HB 1784  
Cosmopolite, Hcrp.

#### **Thymelaeaceae / Sıyrıncıkçiller**

*Daphne pontica* L. / sırımağı.  
Stony slopes, 2100 m, 22.07.2016, HB 1543  
Eux, Chp.

#### **Ulmaceae / Karaağaçgiller**

*Ulmus glabra* Huds. / dağ karaağacı.  
Mixed forest, 1700 m, 24.05.2016, HB 1162  
Euro-Sib, Php.

*U. minor* Mill. / ova karaağacı.  
Streamsides, 1650 m, 23.06.2016, HB 1360  
Medit, Php.

#### **Urticaceae / Isırganlıgiller**

*Urtica dioica* L. subsp. *dioica* / ısırgan.  
Streamsides, 2300 m, 05.09.2016, HB 1741  
Euro-Sib, Hcrp.

#### **Violaceae / Menekşegiller**

*Viola altaica* Ker.-Gawl. / altay menekşesi.  
Meadows, 2200 m, 07.07.2016, HB 1461  
Hcrp.

*V. sieheana* W. Becker / çayır menekşesi.  
Under shrubs, 1750 m, 08.06.2016, HB 1230  
Hcrp.

*V. tricolor* L. / hercai menekşe  
Under shrubs, 1900 m, 23.06.2016, HB 1344

Thp.

#### 4. Conclusions and discussion

The vascular flora results of the current study (CS.) are summarized and discussed below. Three specimens for each taxon were collected from Tunca Valley Park between the years 2016-2017. After detailed identification and checking 408 vascular plant taxa belonging to 244 genera and 64 families were determined. 1 of them is Lycopodiophyt, 16 of them are Pteridophytes and 391 were Magnoliophytes. The dispersion of Magnoliophytes are as follows; 2 Pinophytina and 389 Magnoliophytina (Table 1). The forest vegetation covers 2565 hectare of the study area (62.7%). The high dominance of tree species can be one of the most important reasons of the low taxa number in the study area.

Table1. The dispersion of taxa into large taxonomical groups

Systematic categories	Families	Genera	Species	Subsp.	Var.	Taxa	Endemics
Lycopodiophyta	1	1	1	-	-	1	-
Pteridophyta	9	10	15	-	1	16	-
Magnoliophyta	54	231	284	88	19	391	-
Pinophytina	2	2	1	1	-	2	-
Magnoliophytina	52	229	283	87	19	389	20
<b>Total</b>	<b>64</b>	<b>244</b>	<b>300</b>	<b>88</b>	<b>20</b>	<b>408</b>	<b>20</b>

The order, number and ratio of the phytogeography element status are Euro-Siberian (Eux and Hyrc-Eux included) 237 (58.1%), Irano-Turanian 14 (3.4%), Mediterranean 5 (1.2%), and multiregional or of unknown phytogeographic origin 152 (37.3%), respectively (Table 2). The dominance of the Euro-Siberian elements in the study (Table 2) confirms that the study areas are in the Euro-Siberian floristic province. The microclimates and microhabitats in the study area can be the reason of the Mediterranean and Irano-Turanian elements.

Table 2. Phytogeography elements

Phytogeography regions	Number	%
<b>Euro-Sib.</b>	105	25.7
<b>Eux</b>	114	28.0
<b>Hyrc-Eux</b>	18	4.4
<b>Ir-Tur.</b>	14	3.4
<b>Medit.</b>	5	1.2
<b>Cosm and others</b>	152	37.3
<b>Total</b>	<b>408</b>	<b>100</b>

In alpine and subalpine parts of any study the endemism ratio is much higher than the other parts. Even though there are alpine and subalpine vegetation in the study area, as mentioned above 62.7% of the study area covered with the tree species and this is the main reason of the low endemism.

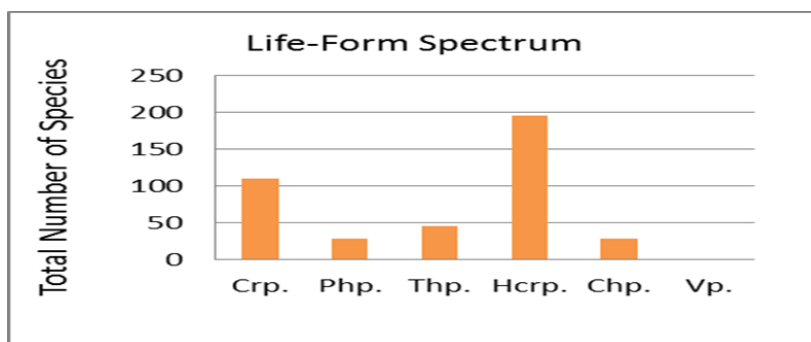


Figure 3. Life form spectrum of taxa

In the study area, Hemicryptophytes (196 taxa and 48.0%) are the dominant life spectra and cryptophytes 110 (26.9%), therophytes 46 (11.3%), chamaephytes 28 (6.8%), phanerophytes 28 (6.8%), vasicular parasites 1 (0.2%) are following them respectively (Table 3).

Table 3. The richest families in taxa

Families	Number of taxa	Ratio (%)
<i>Asteraceae</i>	44	10.8
<i>Poaceae</i>	31	7.6
<i>Fabaceae</i>	26	6.4
<i>Caryophyllaceae</i>	25	6.1
<i>Lamiaceae</i>	21	5.1
<i>Rosaceae</i>	19	4.7
<i>Ranunculaceae</i>	17	4.2
<i>Apiaceae</i>	11	2.7
<i>Cyperaceae</i>	10	2.5
<i>Primulaceae</i>	10	2.5
<b>Total</b>	<b>214</b>	<b>52.6</b>

The richest families about total taxa numbers are *Asteraceae* (44), *Poaceae* (31), *Fabaceae* (26), *Caryophyllaceae* (25), *Lamiaceae* (21), *Rosaceae* (19), *Ranunculaceae* (17), *Apiaceae* (11), *Cyperaceae* (10), *Primulaceae* (10) (Table 3).

*Poa* (8), *Carex* (8), *Trifolium* (7), *Primula* (7), *Geranium* (6), *Ranunculus* (6), *Astragalus* (5), *Rumex* (5), *Vicia* (5), and *Asplenium* (5) are the richest genera in total taxa number (Table 4).

Table 4. The richest genera in taxa.

Genera	Number of taxa	Ratio (%)
<i>Poa</i>	8	2.0
<i>Carex</i>	8	2.0
<i>Trifolium</i>	7	1.7
<i>Primula</i>	7	1.7
<i>Geranium</i>	6	1.5
<i>Ranunculus</i>	6	1.5
<i>Astragalus</i>	5	1.2
<i>Rumex</i>	5	1.2
<i>Vicia</i>	5	1.2
<i>Asplenium</i>	5	1.2
<b>Total</b>	<b>62</b>	<b>15.2</b>

Table 5. Comparison of total taxa number, phytogeographic elements and endemism of study with nearby studies

Studies	Total taxa	Euro-Sib	Ir-Tur.	Medit.	Cosm. and other	End.
Current study	408	58.1	3.4	1.2	37.3	4.9
Eminağaoğlu (2003)	769	35.6	6.9	2.2	55.3	7.4
Eminağaoğlu (2004)	872	39.4	10.3	1.2	49.1	6.3
Baykal (2016)	518	43.2	4.1	2.1	50.6	7.0

The total taxa number in the study area (408) is smaller than the compared studies (Table 5). The total taxa number is closely related with the geographical size, diversity of habitat, and edaphic factors etc. Most of the study area is covered with the forest vegetation, so the vegetation types and habitat diversity is lower than the compared studies. This factor can explain the reason of lower taxa number in the study. The phytogeographical element status of taxa are Euro-Siberian (including Eux and Hyrc-Eux) (58.0%), multiregional or of unknown phytogeographical origin (37.4%), Irano-Turanian (3.4%), Mediterranean (1.2%), respectively. The study area is in the borderlines of Euro-Siberian floristical province and it clarifies the dominancy of Euro-Siberian elements and it is compatible with the compared studies (Table 5). Presence of Mediterranean and Irano-Turanian element can be explained by the presence of microclimates. The endemism ratio of the current study (4.9%) is lower than the compared studies (Table 5). The reasons of low endemism are of course related with homogeneity of climate and environment but especially the presence and abundance of tree species in the study area.

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