Chapter 17
Floral Diversity of the High Altitudes of Amanos Mountains: A Case Study from Daz Mountain-Mıgır, Turkey

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17.1 Introduction

The region below the snow line but above the tree line on the high mountains of temperate and tropical areas is delimited as the alpine zone. Its lower limits vary in different regions of the world. In Turkey, it lies above 1800 m following the subalpine zone below it. The zone is typically occupying the area approximately above 2000 m. The subalpine zone shows a scanty tree cover and is dominated by dwarf shrubs and moist meadow communities, later forming a transition zone. As the altitude increases on the high-altitude ecosystems, rainfall, wind, evaporation, and direct solar radiation increase. However, temperature, oxygen, atmospheric pressure, and nitrogen mineralization decrease (Guleryuz et al. 2010). Moreover, ecological features of the northern and southern slopes differ to a greater extent. Accordingly, different types of vegetation belts are formed and the vegetation period gets shortened under the influence of different altitudes (Atay et al. 2009; Sarı 2010).

Since the ice age, climate change has affected the geographical distribution of different ecosystems, leading towards a spread of the alpine vegetation zones in the vertical direction. However, the plant taxa show specific changes and adapt to the environmental conditions as well as climate changes differently. Consequently, in the past, different species were occurring at high altitudes in place of such communities. A change in the environmental conditions leads to species migrations, species compositions, and the emergence of new taxa; this process is actually continuing even now.

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A total of 8000–10,000 taxa of flowering plants are reported to grow globally in the alpine belts, which is 4% of the world's approximately 250,000 species of flowering plants (Ozturk et al. 2010a). Very difficult and adverse conditions prevail at these high altitudes; however, the plant diversity still is quite high compared to several areas at low elevations (Ozturk et al. 1991, 2002; Körner 1995; Atay et al. 2009).

The plants growing in the alpine environment under harsh climatic conditions accordingly show adaptations in the shape; with stunted appearances, height is smaller and majority are herbaceous except for some shrubs. Adaptive forms of plants (called Krummholz) in this difficult environment enable them to be more resistant to the severe cold and snow. Almost all are perennials with underground root or even stems (Kılınç and Kutbay 2004).

The alpine plants also called orophytes (for example Poaceae and Cyperaceae) have developed adaptive features against the extreme environmental conditions existing at high altitudes like hard sometimes pointed and often rounded leaves. They possess vivid showy flowers with bright colors as in Orchidaceae, Primulaceae, and Gentianaceae.

Some dwarf shrubs and herbaceous plant formations dominate these altitudes at 2000 m. Some of the representatives are: *Juniperus communis, Juniperus nana,* and *Daphne oleoides,* forming very closed communities at places. The species of *Festuca, Verbascum,* and *Thymus* are the most common herbaceous plants distributed here (Uysal et al. 2011). The most common plant genera found here are: *Acantholimon, Alchemilla, Allium, Alyssum, Astragalus, Bellis, Campanula, Carex, Centaurea, Crocus, Dianthus, Draba, Gentiana, Gypsophila, Papaver, Potentilla, Primula, Ranunculus, Salvia, Saxifraga, Sedum, Silene,* and *Veronica* (Sarı 2010).

The mountainous areas in general are very important in terms of biodiversity, in particular the endemic plants (Uysal et al. 2011). The ratios of endemism are very high; more endemic species are present here. If the invading species spread here, they will lose the opportunity to grow, or the extensive areas covered currently will gradually decrease, leading to a withdrawal of these plants, although under present conditions, the species growing on the mountainous areas restrict the invasions to some extent (Efe et al. 2008, 2011a, 2011b, 2012, 2014a, 2014b).

Turkey, with its rich plant diversity of over 10,000 taxa, occupies an important position in the Southwest Asia (Davis 1965–1985; Davis et al. 1988; Guner et al. 2000; Ozturk et al. 2008a, 2012a, b). The reasons for this are that the country is situated at an important geographical location bridging three continents, which has been further encouraged by its history, topography, geology, and different climatic conditions. The floral elements distributed in different phytogeographical regions embody different elements and a high ratio of endemics is a natural consequence of all these characteristics. Therefore, the country has attracted the attention of hundreds of investigators, particularly from 1701 onwards. In this chapter, detailed information on the plant diversity of Mıgır hill, with an altitude of 2240 m (Daz Mountains) as the highest peak of Amanos Mountains, located on the eastern coast of the Gulf of Iskenderun, will be provided with possible implications of future climate change scenarios.

Fig. 17.1 General view and location of the study area

17.2 Study Area

The area investigated by us is situated in the province of Hatay in southeastern part of Turkey (along the Gulf of Iskenderun), between 35°36′45″ and 36°28′50″ east longitudes and 36°44′40″–37°04′15″ north latitudes. The subalpine vegetation forms a wide belt on the mountain of Daz in particular on Mıgır hill with an altitude of 2240 m (Fig. 17.1). Erzin, Ozerli, Deliçay, and Payas streams take their origin from this area and flow down into the Gulf of Iskenderun.

Geologically, this area is formed from Mesozoic and Cretaceous limestones, upper Cretaceous ultrabasic rocks (Gabro and Serpentine), and Tertiary marls. The plains in the area consist of quaternary alluvial materials. Common soil formations distinguished in the area are as follows: brown calcareous soils, brown forest soils, terrarosa soils, reddish-brown Mediterranean soils, colluvial soils, and mixed land types (Akman 1973). The summers here are hot and dry, but winters are mild and rainy as the Mediterranean climate prevails all through this region (Ozturk 1995; Ozturk et al. 2008a; Ozkan et al. 2010). Annual rainfall varies between 921.9 and 1500 mm, depending on the elevation and direction. Seasonal rainfall regime is as follows: winter, spring, autumn, and summer. From the beginning of December until the end of March, precipitation in the form of snow is seen at places above 1000 m. The average annual temperature of the area is 19.3 °C. In August, average maximum temperature is 32.8 °C and the minimum average temperature of 6 °C is seen in January. Ombrothermal climate diagram, derived from Dortyol meteorological station climatic data and covering the period between 2000 and 2012 is presented in Fig. 17.2.

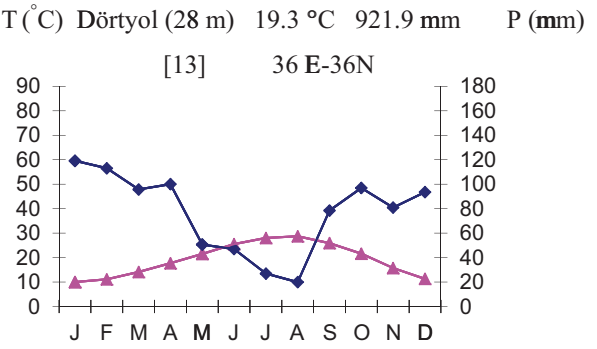

Fig. 17.2 Ombrothermic diagram of the study area. The dry period in June–October, the rainy period (>100 mm) in February

17.3 Plant Diversity

Our investigations on the specimens collected from the area and identified with the help of flora of Turkey (Davis 1965–1985; Davis et al. 1988; Guner et al. 2000) have revealed that 660 vascular plant taxa belonging to 387 genera from 98 families are distributed here (Appendix). All the herbarium specimens have been deposited at the "Herbarium of the Science and Arts Faculty—Çukurova University (ADA) and include information on their phytogeographical region as: Med. = Mediterranean, Euro-Sib. = Euro-Siberian, Ir-Tur. = Irano-Turanian, End. = Endemic.

The phytogeographical distribution of these taxa is as follows (Table 17.1): Mediterranean 196 (29.7%); Euro-Siberian 71 (10.8%); Irano-Turanian 41 (6.2%); Cosmopolitan and unknown 353 (53.3%). The total number of endemics is 53 and the ratio of endemism is 8%.

The Mediterranean elements are dominating the list simply due to the prevalence of Mediterranean climate here. The Euro-Siberian elements, which were widely distributed in the Pleistocene ice age, have progressed southwards along the Anatolian Diagonal, and due to the humid climatic conditions, they are still continuing to grow in the study area (Davis et al. 1971). The Euro-Siberian floristic region in Turkey is a very widespread area with typical *Fagus orientalis* forest formation. In the Mıgır hill, large, frequent, and pure community is distributed on the northern slopes between 1600 and 1900 m, (Yilmaz 1993; Kehl 1998; Turkmen and Duzenli 1998).

The dominating families and the number of taxa these embody are: Leguminosae, 78 (11.8%); Compositae, 74 (11.2%); Gramineae, 48 (7.3%); Labiatae,

Table 17.1 A comparison of the phytogeographical elements in the study area

Phytogeographic region	Number of species	Percent of sample total
Mediterranean	196	29.7
Euro-Siberian	71	10.8
Irano-Turanian	41	6.2
Multiregional	353	53.4

Table 17.2 The families represented with 12 and more species in the study area

Family	Distribution	%
Fabaceae	78	11.8
Asteraceae	74	11.2
Poaceae	48	7.3
Lamiaceae	41	6.2
Liliaceae	30	4.5
Brassicaceae	30	4.5
Rosaceae	25	3.8
Caryophyllaceae	21	3.2
Scrophulariaceae	21	3.2
Apiaceae	19	2.9
Boraginaceae	17	2.6
Rubiaceae	17	2.6
Orchidaceae	12	1.8
Others	227	34.4

41 (6.2%); Cruciferae, 30 (4.5%); Liliaceae, 30 (4.5%); Rosaceae, 25 (3.7%); Scrophulariaceae, 21 (3.2%), Umbelliferae, 19 (2.8); Caryophyllaceae, 17 (2.5%), Boraginaceae, 17 (2.5%), and Rubiaceae 17 (2.5%) (Table 17.2).

The rare and endemic species and their International Union for Conservation of Nature (IUCN) categories are as follows: CR: 1 EN: 1, VU: 15, DD: 2, NT: 12, and LC: 22 (Table 17.3) IUCN (Ekim et al. 2000; IUCN 2011).

In the study area, the Mediterranean, sub-Mediterranean, and subalpine plant belts also exist (Altan 1984; Atalay 1987).

Mediterranean Belt This zone exists up to 850 m and above with hard-leaved evergreen plants. *Pinus brutia* forests cover the lower areas. Most common species are: *Quercus coccifera, Erica manipuliflora, Rhamnus punctatus, Rinanthus angustifolius, Pistacia terebinthus* ssp. *palaestina, Cotinus coggyre, Phyllyre latifolia* ssp. *orientalis, Myrtus communis* ssp. *communis, Arbutus andrachne, Styrax officinalis, Cistus creticus,* and *Calicotome villosa*.

Sub-Mediterranean Belt It is distributed between 850 and 1900 m, the end of the forest limit with deciduous plants. Common species include *Fagus orientalis, Pinus brutia, Quercus cerris* var. *cerris, Pinus nigra* ssp. *pallasiana, Carpinus orientalis, Cedrus libani,* and *Abies cilicica* (Gucel et al. 2008).

Subalpine Belt This belt starts from 1900 m extending up to the summit of this mountain (2240 m). The steppe vegetation with herbaceous species and shrubs dominates the belt. Most common species are: *Acantholimon libanoticum, Marrubium globosum* ssp. *globosum, Astragalus macrourus, Ferula elaeochytris, Rosa pulverulenta Cerasus prostrate* var. *prostrata, Cotoneaster nummularia, Vincetoxicum tmoleum, Asperula stricta* ssp. *monticola, Thymus kotschyanus* var. *glabres-*

Table 17.3 The endangered species of the study area and their IUCN red data list categories

Endangered plants	Conservation status
Centaurea cataonica Boiss. & Hausskn.	NT
C. lycopifolia Boiss. & Kotschy	NT
C. ptosimopappa Hayek Med.	VU (B1 a,b and B2 a,b)
Galatella amani (Post) Grierson	VU (B1 a,b and B2 a,b)
Helichrysum arenarium (L.) Moench ssp. *aucheri* (Boiss.) Davis et Kupicha	LC
Inula anatolica Boiss.	LC
Leucocyclus formosus Boiss. ssp. *amanicus* (Rech. fil.) Hub.-Mor. & Grierson	NT
Pilosella hoppeana (Schultes) C.H. & F.W. Schultz ssp. *isaurica* Hub.-Mor.	LC
Alkanna amana Rech. fil.	DD
Onosma inexspectatum Teppner	LC
Aethionema capitatum Boiss. & Ball.	NT
Alyssum murale Waldst. & Kit. var. *haradjianii* (Rech.) Dudley	VU (B1 a,b and B2 a,b)
Erysimum alpestre Kotschy ex Boiss.	LC
Isatis candolleana Boiss.	LC
Ricotia sinuata Boiss. & Heldr.	LC
Thlaspi densiflorum Boiss. et Kotschy	NT
T. elegans Boiss.	VU (B1 a,b and B2 a,b)
T. violascens Boiss.	LC
Michauxia tchihatchewii (Boiss.) Hand.-Mazz.	NT
Phryna orthegioides (Fisch. & C.A. Mey.) Pax & K. Hoffm.	NT
Cephalaria taurica Szabo	VU (B1 a,b and B2 a,b)
Scabiosa kurdica Post	VU (B1 a,b and B2 a,b)
Euphorbia rhytidosperma Boiss. & Bal.	VU (B1 a,b and B2 a,b)
Astragalus antiochinus Post	DD
A. campylosema Boiss. ssp. *campylosema*	LC
Chamaecytisus drepanolobus (Boiss.) Rothm.	NT
Lathyrus laxiflorus (Desf.) Kuntze ssp. *angustifolius* (Post ex Dinsm.) Davis	VU (B1 a,b and B2 a,b)
Trifolium davisii Hossain	VU (B1 a,b and B2 a,b)
Vicia canescens Lab. ssp. *canescens*	NT
Quercus petraea (Mat.) Liebl. ssp. *pinnatiloba* (C. Koch) Menitsby	LC
Herniaria saxatilis Brummitt	VU (B1 a,b and B2 a,b)
Crocus cancellatus Herbert ssp. *cancellatus* Herbert	LC
Gladiolus anatolicus (Boiss.) Stapf	LC
Lamium microphyllum Boiss.	VU (B1 a,b and B2 a,b)

Table 17.3 (continued)

Endangered plants	Conservation status
Marrubium globosum Montbret et Aucher ex Bentham ssp. *globosum*	LC
Phlomis longifolia Boiss. & Bal. var. *bailanica* (Vierh.) Hub.-Mor.	NT
Satureja amani P.H. Davis	CR (B1 a,b and B2 a,b)
Scutulleria glaphyrostachys Rech. fil.	VU (B1 a,b and B2 a,b)
S. rubicunda Hormem ssp. *brevibracteata* (Stapf.) Edmond	LC
S. salviifolia Bentham	LC
Thymus sipyleus Boiss. ssp. *sipyleus* var. *sipyleus*	NT
Alcea apterocarpa (Fenzl.) Boiss.	LC
Fraxinus ornus L. ssp. *cilicica* (Lingels.) Yalt.	LC
Dactylorhiza osmanica (L.) Soo' var. *osmanica*	LC
Acanthalimon acerosum (Willd.) Boiss. var. *brachystachyum* Boiss.	VU (B1 a,b and B2 a,b)
Festuca adanensis Markgr.-Dannenb.	NT
Potentilla calycina Boiss. and Bal.	LC
Asperula cymulosa (Post) Post	VU (B1 a,b and B2 a,b)
A. stricta Boiss. ssp. *monticola* Ehrend.	LC
Verbascum caesareum Boiss.	VU (B1 a,b and B2 a,b)
V. cheiranthifolium Boiss. var. *asperilum* (Boiss.) Murb.	LC
V. linearilobium (Boiss.) Hub.-Mor.	EN (B1 a,b and B2 a,b)
Veronica orientalis Boiss. Miller ssp. *nimordi* (Reichter ex Stapf.) M.A. Fischer	LC

CR (B1 a,b and B2 a,b) Critically endangered: Extent of occurrence less than 5000 km^2 ; area of occupancy less than 500 km^2 ; known no more than five locations; inferred decline in the area, extent and/or quality of habitat, *EN* (B1 a,b and B2 a,b) Endangered: Extent of occurrence less than 100 km^2 ; area of occupancy less than 10 km^2 ; known to exist at only a single location; inferred decline in the area, extent and/or quality of habitat, *VU* (B1 a,b and B2 a,b) Vulnerable: Extent of occurrence less than 20,000 km^2 ; area of occupancy less than 2000 km^2 ; known no more than ten locations; inferred decline in the area, extent, and/or quality of habitat, *NT* Near threatened, *LC* Least concern

cens, Verbascum amanum, Asphodelina damascene ssp. *damascene, Echinops ritro, Eremurus spectabilis, Carpinus orientalis, Cedrus libani,* and *Abies cilicica.*

The reasons for the rich and interesting plant diversity in this area are that it is the main distribution area for the eastern Black Sea and central European deciduous plant species. These Euro-Siberian floristic elements (*Fagus orientalis, Acer platonoides, Alnus glutinosa* ssp. *glutinosa, Populus tremula, Salix alba* ssp. *alba, Corylus avellena* ssp. *avellena, Eonymus latifolius* ssp. *latifolius, Buxus sempervirens, Tilia argentea, Ulmus glabra, Sorbus torminalis* ssp. *torminalis, Sambucus nigra, Sambucus ebulus, Ilex colchica, Atropa belladonna, Eupotarium cannabinum,* and

Solanum dulcamara) are growing approximately 400–500 km away from their natural habitats, forming the southernmost distribution area of these plant taxa. We also see this area as the main distribution site of Lebanon and Anti-Lebanon region, containing the species like *Quercus libani, Satureja amani, Astragalus antiochianus, Rhamnus libanoticus, Pyrus syriacus* var. *syriaca,* and *Acantholimon libanoticum*. The area thus forms the northernmost area for these plants.

17.4 Climate Change

The study area is situated in the Mediterranean zone of Turkey. It is already facing threats due to human interferences, land degradation, and fires, and the situation will get escalated due to climate change and is expected to be felt most seriously in the eastern Mediterranean which includes our study area as well (Ozturk et al. 2008a, 2010b, 2011). A global climate change will affect species and ecosystems. The existing vegetation in the study area will be affected substantially by this change because of the special topography, climate, and geographical location of this area. The life cycle of plants corresponds to the seasonal cues, so any shifts in the timing of such cycles will be reflected here; accelerated spring onset will generate noticeable changes in such phonological features like timings of plants, first bud bursts, first leafing, first flowerings, and first seed or fruit dispersal of species. All these will prove detrimental if an area is prone to cold. Any cold spell occurring a few days or weeks after early blooming will mean that early buds or fruits will freeze; the rare and interesting species at these altitudes, including the economically important plants, will be potentially killed or their production will be hindered. The study area is a highly interesting habitat; it is like an enclave for the Euro-Siberian and several other elements in the Mediterranean. In view of this, there is a need for intensive and immediate research into the effects of climatic fluctuations on the plants of this area in general (Feoli et al. 2003). The predicted climate scenarios on temperature increases will interfere with the hydrological conditions, thus seriously threatening the survival of cryo-hygrophilous high-altitude plant taxa in the Amanos area. The endemics will get full share from all these impacts. The upward migrations due to warming temperatures will end up with the shifting patterns in the vegetation belts here, followed by drought-tolerant invaders from lower altitudes, ultimately leading towards biodiversity losses (Ozturk et al. 2008b; Ozkan et al. 2010; Guleryuz et al. 2010; Uysal et al. 2011).

17.5 Appendix

The Floristic List
Aceraceae
Acer platanoides L. Euro-Sib

Adiantaceae
Adiantum capillis-veneris L.
Amaranthaceae
Amaranthus blitoides S. Wats.
A. chlorostachys Willd.
A. lividus L.
A. retroflexus L.
Anacardiaceae
Cotinus coggyria Scop.
Pistacia terebinthus L. ssp. *palaestina* (Boiss.) Engler
Rhus coriaria L.
Apiaceae (umbelliferae)
Ainsworthia trachycarpa Boiss. Med.
Ammi majus L. Med.
Bunium ferulaceum Sm. Med.
Bupleurum intermedium Poiret
Cnidium silaifolium (Jacq.) Simonkai ssp. *orientalis* (Boiss.) Tutin
Daucus guttatus Sm.
Eryngium creticum Lam. Med
E. falcatum Delar Med.
Ferula elaeochytris Korovin Med.
Ferulago cassia Boiss. Med.
F. trachycarpa Boiss.
Laser trilobium (L.) Borkh.
Laserpitium glaucum Post Med.
Lecokia cretica (Lam.) DC.
Sanicula europaea L. Euro-Sib
Smyrnium connatum Boiss. & Kotschy Med.
Torilis arvensis (Huds.) Link ssp. *neglecta* (Sprengel) Thellung
T. arvensis (Huds.) Link ssp. *arvensis*
Turgeniopsus foeniculacea (Fenzl.) Boiss.
Apocynaceae
Nerium oleander L. Med.
Vinca major L. ssp. *major* Med.
Aquifoliaceae
Ilex colchica Poj. Euro-Sib
Araceae
Arum dioscoridis Sm. var. *liepoldtii* (Scott) Engler Med.
Araliaceae
Hedera helix L.
Asclepiadaceae
Vincetoxicum tmoleum Boiss. Ir-Tur
Aspidiaceae
Polystichum setiferum (Forssk.) Woynar.
Dryopteris filix-mas (L.) Schott. Med.

D. pallida (Bory) Fomin.
Aspleniaceae
Asplenium adiantum-nigrum L.
A. cuneifolium Viv.
A. septentrionale (L.) Hoffm. ssp. *septentrionale* (L.) Hoffm.
A. trichomanes L.
Ceterach officinarum DC.
Phyllitis sclopenendrium (L.) Newm.
Asteraceae (compositae)
Achillea coarctata Poir.
A. grandiflora Friv.
Anthemis kotschyana BOISS. var. *radians* Bornm.
A. tinctoria L. var. *tinctoria*
Arctium minus (Hill) Bernh. ssp. *pubens* (Babington) Arenes Euro-Sib
Bellis perennis L. Euro-Sib
Carduus amanus Rech. fil..
Carlina oligocephala Boiss. & Kotschy ssp. *oligocephala* carpa Moris Med.
Centaurea aegialophila Wagenitz Med.
C. aucheri (DC.) Wagenitz *Ir-Tur*
C. babylonica (L.) L. Med
C. calcitrapa L. ssp. *calcitrapa* Med.
C. cataonica Boiss. & Hausskn. End
C. lycopifolia Boiss. & Kotschy Med. End
C. ptosimopappa Hayek Med. End
C. solstitialis L. ssp. *solstitialis*
Calendula arvensis L.
Cardopatium corymbosum (L.) Pers. Med.
Carduus nutans L. ssp. *nutans*
C. pycnocephalus L. ssp. *albidus* (Bieb.) Kazmi
Chrysanthemum segetum L. Med.
Cichorium pumilum Jack Med.
Cirsium leuconeurum Boiss. & Hausskn.
Condrilla juncea L. *var. juncea*
Conyza bonariensis (L.) Cronquist
C. canadensis (L.) Cronquist
Crepis reuterana Boiss. ssp. *reuterana*
C. sancta (L.) Babcock
Doronicum orientale Hoffm.
Echinops ritro L.
E. viscosus DC. ssp. *bithynicus* (Boiss.) Rech. fil.
Eupotarium cannabinum L.
Galatella amani (Post) Grierson Med. End
Gundelia tournefortii L. var. *tournefortii*
Hedypnois cretica (L.) Dum.-Cours. Med.

Helichrysum arenarium (L.) Moench ssp. *aucheri* (Boiss.) Davis et Kupicha Ir-Tur End
H. armenium DC. ssp. *armenium*
H. plicatum DC. ssp. *plicatum*
Helminthotheca echioides (L.) Holub. Med.
Hieracium laevigatum Willd. Euro-Sib
Hypochoeris radicata L. var. *heterocarpa* Moris Euro-Sib
Inula anatolica Boiss. End
I. salicina L. Euro-Sib
I. vulgaris (Lam.) Trevisan Euro-Sib
Lapsana saligna L.
L. *serriola* L. Euro-Sib
Lapsana communis L. ssp. *intermedia* (Bieb.) Hayek
L. *communis* L. ssp. *psidica* (Boiss. & Heldr.) Rech. fil.
Leontodon hispidus L. var. *hispidus*
Leucocyclus formosus Boiss. ssp. *amanicus* (Rech. fil.) Hub.-Mor. & Grierson Med. End
Onopordum acanthium L.
Pallenis spinosa (L.) Cass. Med.
Picnomon acarna (L.) Cass. Med.
Picris amalecitana (Boiss.) Eig Med.
Pilosella echioides (Lumn.) C.H. & F.W. Schultz ssp. *procera* (Fries) Sell & West
P. hoppeana (Schul.) C.H. & F.W. Schultz ssp. *troica*
P. hoppeana (Schultes) C.H. & F.W. Schultz ssp. *isaurica* Hub.-Mor. Ir-Tur End
Ptilostemon diacantha (Lab.) Greuter Med.
Pulicaria dysenterica (L.) Bernh.
Reichardia intermedia (Schultz Bip.) Hayek Med.
Rhagadiolus stellatus (L.) Gaertner var. *edulis* (Gaert.) DC. Med.
Scorzonera cana (C.A. Meyer) Hoffm. var. *cana* Cosm.
S. cana (C.A. Meyer) Hoffm. var. *radicosa* (Boiss.) Chamb.
S. mollis Bieb. ssp. *szowitzii* (DC.) Chamb. Ir-Tur
Senecio vernalis Waldst & Kit.
Silybum marianum (L.) Gaertner
Sonchus oleraceus L.
Steptorhampus tuberosus (Jacq.) Grossh.
Taraxacum sintensii Dahlst.
Tripleurospermum oreades (Boiss.) Rech. fil. var. *oreades* (Boiss.) Rech. f.
Tyrimnus leucographus (L.) Cass. Med.
Urospermum picroides (L.) F.W. Schmidt. Med.
Xanthium spinosum L.
X. strumarium L. ssp. *cavenillesii* (Scho.) D. Love & P. Dansr.

Athyriaceae
Athyrium filix-foemina (L.) Roth.

Betulaceae

Alnus glutinosa (L.) Gaertn. ssp. *barbata* (C.A. Meyer) Yalt. Euro-Sib
Boraginaceae
Alkanna amana Rech. Fil. Med. End
Anchusa strigosa Labill.
A. undulata L. ssp. *hybrida* (Ten.) Coutinho
Brunnera orientalis (Scheyk) Johnston Euro-Sib
Buglossoides arvensis (L.) Johnston
Cynoglossum creticum L.
C. montanum L. Grande ssp. *cariense* (Boiss.) R. Mill var. *cariense*
Heliotrophium europaeum L. Med.
Lithodora hispidula (Sm.) Griseb. ssp. *versicolor* Meikle Med.
Lithospermum purpurocaeruleum L. Euro-Sib
Myosotis lithospermifolia (Willd.) Hornem. Euro-Sib
M. alpestris F.W. Schmidt.
Onosma frutescens Lam Med.
O. inexspectatum Teppner Med. End
O. tauricum Patlas ex Willd. var. *tauricum*
Paracaryum lithospermifolium (Lam.) Med.
Symphytum brachycalix Boiss. Med.
Brassicaceae (cruciferae)
Aethionema capitatum Boiss. & Ball. End.
Alyssum cassium Boiss. Med.
A. condensatum Boiss. & Hauskn. ssp. *flexibile* (Nyar) Dudley
A. desertorum Stapf. *var. prostratum* Dudley
A. minus (L.) *Rothm.* var. *micranthum* (Meyer) Dudley
A. murale Waldst. & Kit. var. *haradjianii* (Rech.) Dudley End.
A. samariferum Boiss. & Hsusskn.
A. strictum Willd. Ir-Tur
A. strigosum Banks & Sol. ssp. *strigosum*
Arabis caucasica Willd. ssp. *brevifolia* (DC.) Cullen Med.
A. caucasica Willd. ssp. *caucasica*
A. turrita L.
Capsella bursa-pastoris (L.) Medik.
Cardaria draba (L.) Desv. ssp. *draba*
Erysimum alpestre Kotschy ex Boiss. Ir-Tur End.
E. goniocaulon Boiss.
Iberis spruneri Jord. Med.
I. taurica DC.
Isatis candolleana Boiss. Ir-Tur End.
Neslia apiculata Fisch.
Raphanus raphanistrum L.
Ricotia sinuata Boiss. & Heldr. Med. End.
Sisymbrium altissimum L. ssp. *flexibile* (Nyar) Dudley
Thlaspi annuun Koch
T. densiflorum Boiss. et Kotschy End.

T. elegans Boiss. Med. End.
T. praeocox Wulf Euro-Sib
T. oxyceras (Boiss.) Hedge
T. kotschyanum Boiss. & Hohen.
T. violascens Boiss. End.
Turritis glabra L.
T. laxa (Sibth. & Sm.) Hayek
Buxaceae
Buxus sempervirens L. Euro-Sib
Campanulaceae
Asyneuma virgatum (Labill.) Bornm. ssp. *virgatum*
Campanula aucheri A. DC. Euro-Sib
C. postii (Boiss.) Engler Med.
C. rapunculus L. var. *rapunculus* Euro-Sib
C. retrorsa Labill.
C. trachelium L. ssp. *athoa* (Boiss. & Heldr.) Hayek Euro-Sib
Legousia speculum-veneris (L.) Chaix Med.
Michauxia campanuloides L'Herit. ex Aiton Med.
Capparaceae
Capparis spinosa L. var. *spinosa*
Caprifoliaceae
Lonicera xylosteum L.
Sambucus ebulus L. Euro-Sib
S. nigra L. Euro-Sib
Caryophyllaceae
Arenaria leptoclados (Reichb.) Gauss.
Cerastium saccardoanum Dirat
C. glomeratum Thuill. Cosm.
Dianthus polycladus Boiss. Med.
D. orientalis Adams
Gypsophila libanotica Boiss. Med.
Minuartia hybrida (Vill.) Schischk. ssp. *hybrida*
M. mesogitana (Boiss.) Hand.-Mazz. ssp. *mesogitana* Med.
M. tchihatchewii (Boiss.) Hand.-Mazz. End.
Moehringia trinervia (L.) Clairv.
Petrorhagia velutina (Guss.) Ball & Heyward
Phryna orthegioides (Fisch. & C.A. Mey.) Pax & K. Hoffm. Ir-Tur End
Polycarpon tetraphyllum (L.) L.
Silene aegyptiaca (L.) L. fil. ssp. *aegyptiaca*
S. compacta Fischer
S. confertiflora Chowdh.
S. flavescens Waldst. & Kit.
S. italica (L.) Pers.
S. odontopetala Fenzl
S. vulgaris (Moench) Garcke var. vulgaris

Telephium imperati L. ssp. *orientale* (Boiss.) Nyman
Vaccaria pyramidata var. grandiflora (Fisch. ex DC.) Cullen
Celastraceae
Euanymus latifolius (L.) Mill. ssp. *latifolius* Euro-Sib
Chenopodiaceae
Chenopodium album L. ssp. *album* var. *album*
C. foliosum (Moench.) Aschers.
Cistaceae
Cistus creticus L. Med.
C. salviifolius L.
Fumana arabica (L.) Spach var. *arabica*
F. thymifolia (L.) Variot var. *thymifolia* Med.
Helianthemum ledifolium (L.) Miller var. *microcarpum* Willk.
H. nummularium (L.) Miller ssp. *tomentosum* (Scop.) Schnz et Thellung
Convolvulacae
Calystegia silvatica (Kit.) Griseb.
Convolvulus arvensis L. Cosm.
C. dorycnium L. ssp. *oxycephalus* (Boiss.) Rech. fil Med.
Cornaceae
Cornus mas L. Euro-Sib
C. sanguinea L. ssp. *australis* (C.A. Mey.) Jav. Euro-Sib
Corylaceae
Carpinus orientalis Miller
Corylus avellana L. var. *avellana* Euro-Sib
Ostrya carpinifolia Scop. Med.
Crassulaceae
Rosularia libanotica (Lab.) Muirhead Med
Sedum album L.
S. caespitosum (Cav.) DC. Med.
S. hispanicum L. var. *hispanicum*
S. pallidum Bieb. var. *pallidum*
S. rubens L. Med.
Cupressaceae
Juniperus oxycedrus L. ssp. *oxycedrus*
Cuscutaceae
Cuscuta brevistyla A. Braun
C. campestris Yuncker Cosm.
Cyperaceae
Bolboschoenus maritimus (L.) Palla var. *cymosus*
Carex distans L. Euro-Sib
C. divulsa Stokes subsp. *divulsa* Eur-Sib
C. flacca Schreber ssp. *serrulata* (Biv.) Greuter Med.
C. pendula Hudson Euro-Sib
Cyperus rotundus L.
Scirpoides holoschoenus (L.) Sojak

Dioscareaceae
Tamus communis L. ssp. *communis*
Dipsaceae
Cephalaria taurica Szabo Med. End
Scabiosa calocephala Boiss.
S. columbaria L. ssp. *columbaria var. intermedia* (Post) Matws.
S. columbaria L. ssp. *ochroleuca* (L.) Coulter var. *webbiana* (Don) Matws
S. kurdica Post Med. End
Ephedraceae
Ephedra campylopoda C.A. Meyer
Equisetaceae
Equisetum palustre L.
Ericaceae
Arbutus andrachne L.
A. unedo L.
Erica manipuliflora Salisb. Med.
Euphorbiaceae
Mercurialis annua L.
M. ovata Sternb. & Hoppe Euro-Sib.,
Euphorbia herniariifolia Willd. var. *glaberrima* Hal. Med.
E. supina Rafin
E. rhytidosperma Boiss. & Bal. Med., End
E. apios L. var. *lamprocarpa* Boiss. Med.
E. helioscopia L.
E. peplus L. var. *peplus*
E. falcata L. ssp. *falcata* var. *falcata*
E. macrostegia Boiss.
Fabaceae (leguminosae)
Alhagi mannifera Desv.
Astragalus antiochinus Post Med. End
A. campylosema Boiss. ssp. *campylosema* Ir-Tur End
A. depressus L.
A. glycyphyllos L. ssp. *glycyphylloides* (DC.) Matws. Ir-Tur
A. hamosus L.
A. macrourus Fisch. & Mey. Ir-Tur
A. russelii Banks & Sol. Ir-Tur
A. schizopterus Boiss. Med.
A. thiebautii Eig Med.
Calicotome villosa (Poiret) Link Med.
Ceratonia siliqua L. Med.
Cercis siliquastrum L. ssp. *hebecarpa* (Bornm.) Yalt.
Chamaecytisus drepanolobus (Boiss.) Rothm. Med. End
C. hirsutus (L.) Link
Colutea cilicica Boiss. et Bal.
Coronilla emerus L. ssp. *emerus* (Boiss. & Sprun.) Uhrova

C. parviflora Willd. Med.
Cytisopsis dorycniifolia Jaub. & Spach. ssp. *dorycniifolia*
Dorycnium graecum (L.) Ser. Euro-Sib
D. hirsutum (L.) Ser. Med.
D. pentaphyllum Scop. ssp. *haussknechtii* (Boiss.) Gams
Genista anatolica Boiss. Med.
G. lydia Boiss. var. *antiochia* (Boiss.) P. Gibbs. Med.
G. lydia Boiss. var. *lydia*
Gonocytisus angulatus (L.) Spach Med.
Hymenocarpus circinnatus (L.) Savi Med.
Lathyrus annuus L. Med.
L. *aphaca* L. *var. modestus* P.H. Davis Med.
L. *laxiflorus* (Desf.) Kuntze ssp. *angustifolius* (Post ex Dinsm.) Davis Med. End.
L. *niger* (L.) Bernh. ssp. *niger* Euro-Sib
L. *spathulatus* Cel. Med.
Lens ervoides (Brign.) Grande Med.
Lotus angustissimus L.
L. *corniculatus* L. var. *corniculatus*
L. *peregrinus* L. var. *peregrinus*
Lupinus angustifolius L. ssp. *angustifolius*
Medicago coronota (L.) Bart. Med.
M. lupulina L.
M. minima (L.) Bart. var. *minima*
M. polymorpha L. var. *vulgaris* (Benth.) Shinners
M. rigidula (L.) All. var. *rigidula*
Melilotus elegans Salzm. Med.
M. indica (L.) All.
Onobrychis caput-galli (L.) Lam. Med.
O. gracilis Besser
Ononis phyllocephala Boiss. Med.
O. reclinata L. Med.
O. spinosa L. ssp. *leiosperma* (Boiss.) Sirj.
Prosopis farcta (Banks & Sol.) Macbride
Psoralea bituminosa L. Med.
Scorpiurus muricatus L. var. *subvillosus* (L.) Fiori Med.
Sophora jaubertii Spach Euro-Sib
Spartium junceum L. Med.
Tetragonolobus purpureus Moench Med.
Trifolium angustifolium L. var. *angustifolium*
T. arvense L. var. *arvense*
T. campestre Schreb.
T. davisii Hossain Med. End
T. fragiferum L. var. *pulchellum* Lange
T. hirtum All. Med.
T. lappaceum L. Med.

T. lucanicum Gasp. Med.
T. physoides Stev. ex Bieb. var. *physoides* Med.
T. physoides Stev. ex Bieb. var. *psilocalyx* Boiss. Med.
T. purpureum Boiss. var. *pamphylicum* (Boiss. & Heldr.) Zoh. Med.
T. resupinatum L. var. *microcephalum* Zoh.
T. tomentosum L.
T. tumens Stev. ex Bieb. Euro-Sib
Trigonella kotschyi Fenzl Ir-Tur
T. spruneriana Boiss. var. *sibthorpii* (Boiss.) Hub.- Mor. Med.
Vicia canescens Lab. ssp. *canescens* Ir-Tur End
V. cracca L. ssp. *cracca* Euro-Sib
V. crocea (Desf.) B. Fedtsch. Euro-Sib
V. grandiflora Scop. *var. grandiflora* Med.
V. hybrida L.
V. lunata (Boiss. & Bal.) Boiss. var. *grandiflora* Plitm.
V. sativa L. ssp. *sativa* Cosm.
V. villosa Roth ssp. *eriocarpa* (Hausskn.) P.W. Ball

Fagaceae
Castanea sativa Miller Euro-Sib
Fagus orientalis Lipsky. Euro-Sib
Quercus cerris L. var. *cerris* Med.
Q. coccifera L. Med.
Q. infectoria Oliver ssp. *boissieri* (Reuter) O. Schwarz
Q. libani Oliver Ir-Tur
Q. petraea (Mat.) Liebl. ssp. *pinnatiloba* (C. Koch) Menitsby End

Gentianaceae
Blackstonia perfoliata (L.) Hudson ssp. *serotina* (W. Koch ex Reichb.) Vollmann
Centaurium erythraea Rafin. ssp. *turcicum* (Velen) Melderis

Geraniaceae
Erodium acaule (L.) Becherer & Thell. Med.
Geranium columbinum L.
G. libanoticum Schenk
G. molle L. ssp. *molle*
G. purpureum Vill.
G. robertianum L.
G. tuberosum L. ssp. *tuberosum*

Hypericaceae (guttiferae)
Hypericum confertum Choisy ssp. *stenobotrys* (Boiss.) Holmb.
H. elongatum Ledeb. ssp. *microcalycinum* (Boiss.& Heldr.) Robson Ir-Tur
H. montbreti Spach
H. origanifolium Willd.
H. perforatum L.
H. thymifolium Banks. et Sol. Med.

Hypolepidaceae
Pteridium aquilinum (L.) Kuhn

Illecebraceae
Herniaria hirsuta L.
H. saxatilis Brummitt End.
Paronychia argentea Lam var. *scariossima* Post Med.
Scleranthus annuus L. ssp. *annuus*
Iridaceae
Crocus cancellatus Herbert ssp. *cancellatus* Herbert Med. End
C. kotschyanus C. Koch ssp. *kotschyanus*
Gladiolus anatolicus (Boiss.) Stapf Med. End
G. italicus (Boiss.) Stapf
Gynandriris sisyrinchium (L.) Parl.
Iris unguicularis Poiret Med.
Juglandaceae
Juglans regia Miller
Juncaceae
Juncus inflexus L.
Luzula forsteri (Sm.) DC. Euro-Sib
Lamiaceae (labiatae)
Ajuga chamaepitys (L.) Schreber bsp. *chia* (Schreber) Arcangeli var. *ciliata* Briq.
A. orientalis L.
Ballota nigra L. ssp. *nigra* (Fiori & Beg.) Petzak Med.
Calamintha grandiflora (L.) Moench Euro-Sib
C. nepeta (L.) Savi ssp. *nepeta* Med.
Clinopodium vulgare L. ssp. *arundanum* (Boiss.) Nyman
Lamium garganicum L. ssp. *nepetifolium* (Boiss.) R. Mill.
L. *garganicum* L. ssp. *reniforme* (Montbret & Aucher ex Bentham) R. Mill. Med.
L. *macrodon* Boiss. & Huet Ir-Tur
L. *maculatum* L. var. *maculatum* Euro-Sib
L. *microphyllum* Boiss. Med. End
L. *truncatum Boiss.* Med.
Marrubium globosum Montbret et Aucher ex Bentham ssp. *globosum* Ir-Tur End
Melissa officinalis L. ssp. *officinalis*
Mentha pulegium L.
Micromeria fruticosa (L.) Druce ssp. *barbata* (Boiss. et Kotschy) DAVIS *Med.*
Nepeta cilicica Boiss. Med.
Origanum laevigatum Boiss. var. *laxum* Post Med.
O. syriacum L. *var. bevanii* (Holmes) Leswaart Med.
Phlomis longifolia Boiss. & Bal. var. *bailanica* (Vierh.) Hub.-Mor. Med. End
P. viscosa Poiret Med.
Prunella orientalis Bornm.
P. vulgaris L. Euro-Sib
Salvia glutinosa L. Euro-Sib
S. viridis L. Med.
S. tomentosa Miller Med.
Satureja amani P.H. Davis Med. End

Scutulleria glaphyrostachys Rech. fil. Med. End
S. rubicunda Hormem ssp. *brevibracteata* (Stapf.) Edmond Med. End
S. salviifolia Bentham End
Sideritis libanotica Labill. ssp. *libanotica* Med.
S. perfoliata L. var. *condensata* Boiss.
Stachys annua (L.) L. ssp. *ammophila* (Boiss. & Bl.) Samuel. Med.
S. diversifolia Boiss. Med.
S. pinetorum Boiss. & Bal. Med.
Teucrium polium L. var. *vulgare* Bentham
Thymbra spicata L. var. *spicata* Med.
Thymus leuchotrichus Hal. var. *austroanatolicus* Jales
T. kotschyanus Boiss. & Hohen var. *glabrescens* Boiss. Ir-Tur
T. sipyleus Boiss. ssp. *sipyleus* var. *sipyleus* End
Ziziphora capitata L. ssp. *orientalis* Samuel. ex Rech. Ir-Tur

Lauraceae
Laurus nobilis L. Med.

Liliaceae
Alllium ampeloprasum L. Med.
A. calyptratum Boiss. Med.
A. lycaonicum Siehe ex Hayek
A. scorodoprasum L. ssp. *rotundum* (L.) Stearn Med.
A. sipyleum Boiss. Med.
Asparagus acutifolius L. Med.
Asphodelina globifera J. Gay ex Baker Med.
A. damascena (Boiss.) Baker ssp. *damascena* Ir-Tur
Asphodelus aestivus Brot. Med.
Colchicum cilicicum (Boiss.) Dammer Med.
C. trodii Kotschy Med.
Danae racemosa (L.) Moench
Eremurus spectabilis Bieb. Ir-Tur
Fritillaria acmopetale Boiss. ssp. *acmopetale* Med.
F. hermonis Fenzl ssp. *amana* Rix Med.
F. pinardii Boiss. Ir-Tur
Gagea fibrosa (Desf.) Schultes & Schultes. fil.
Muscari comosum (L.) Mill.
M. neglectum Guss.
M. tenuiflorum Tousch.
Ornithogalum oligophyllum E.D. Clarke
O. ulophyllum Hand.-Mazz.
Polygonatum multiflorum All.
P. orientale Desf. Euro-Sib
Ruscus aculeatus L. var. *angustifolius* Boiss.
Scilla autumnalis L.
S. melaine Speta Med.
Smilax aspera L.

S. excelsa L. Euro-Sib
Urginea maritima L. Med.
Linaceae
Linum aroanium Boiss. & Orph.
L. *bienne* Miller Med.
Loranthaceae
Loranthus europaeus Jacq.
Malvaceae
Alcea apterocarpa (Fenzl.) Boiss. Ir-Tur End.
Althaea cannabina L.
Malva neglecta Waldr.
Moraceae
Ficus carica L. ssp. *carica*
Myrtaceae
Myrtus communis L. ssp. *communis*
Oleaceae
Fraxinus ornus L. ssp. *cilicica* (Lingels.) Yalt. Med. End
Jasminum fruticans L. Med.
Olea europaea L. var. *sylvestris* (Miller) Lehr. Med.
Phillyrea latifolia L. ssp. *orientalis* Sebst. Med.
Onagraceae
Epilobium montanum L. Euro-Sib
Orchidaceae
Anacamptis pyramidalis (L.) L.C.M. Richard Med.
Cephalanthera kurdica Bornm. ex Kranzlin Ir-Tur
C. damasonium (Miller) Druce Euro-Sib
C. longifolia (L.) Fritsch Euro-Sib
C. rubra (L.) L.C.M. Richard
Dactylorhiza osmanica (L.) Soo' var. osmanica Ir-Tur End
D. saccifera (Brong.) Soo' Med.
Epipactis helleborine (L.) Crantz
Limodorum abortivum (L.) Swartz
Orchis mascula (L.) ssp. *pinetorum* (Boiss. & Kotschy) G. Camus Med.
O. morio L. ssp. *syriaca* Camus et al. Med.
Platanthera bifolia (L.) L.C.M. Richard Euro-Sib
Orobanchaceae
Orobanche anatolica Boiss. & Reuter
O. caryophyllacaea Smith
O. crenata Forsskal
Phelypaea coccinea (Bieb.) Poiret Ir-Tur
Oxalidaceae
Oxalis corniculata L. Cosm.
Paeoniaceae
Paeonia mascula (L.) Miller ssp. *mascula*
Papaveraceae

Corydalis alpestris C.A. Meyer Euro-Sib
C. rutifolia (Sibth.& Sm.) DC. ssp. *erdelii* (Zucc.) Cullen & Davis
Hypecoum procumbens L.
Papaver rhoeas L.
P. syriacum Boiss. & Blanche
Phytolaccaceae
Phytolacca pruniosa Fenzl Med.
Pinaceae
Abies cilicica (Ant.& Kotschy) Carr. ssp. *cilicica*
Cedrus libani A. Rich.
Pinus brutia Ten.
P. nigra Arnold. ssp. *pallasiana* (Lamb.) Holmboe
Plantaginaceae
Plantago holosteum Scop. Med.
P. lanceolata L.
P. major L. ssp. *intermedia* (Gilib.) Lange
P. scabra Moench
Platanacae
Platanus orientalis L.
Plumbaginaceae
Acanthalimon acerosum (Willd.) Boiss. var. *brachystachyum* Boiss. Ir-Tur End.
A. libanoticum Boiss. Med.
A. venustum Boiss. var. *venestum* Boiss. Ir-Tur
Poaceae (gramineae)
Aegilops neglecta REq. ex Bertol. Med.
A. speltoides Tausch var. *speltoides*
Agrostis stolonifera L. Euro-Sib
Alepocurus gerardii Vill. var. *gerardii* Med.
Arrhenatherum palaestinum Boiss. Med.
Brachypodium pinnatum (L.) P. Beauv.
Briza minor L.
Bromus intermedius Guss.
B. scoparius L.
B. squarrosus L.
B. sterilis L.
B. tectorum L.
Catapodium rigidum (L.) C.E. Hubbard ex Dony ssp. *rigidum var. majus* (C. Persl) Lainz
Chrysopogon gryllus (L.) Trin.
Crypsis alopecuroides (Piller & Mitterp.) Schrader
Cynodon dactylon (L.) Pers. var. *dactylon*
Cynosurus echinatus L. Med.
Dactylis glomerata L. ssp. *glomerata*
D. glomerata L. ssp. *hispanica* (Roth) Nyman
Dicanthium annulatum (Forsskal.) Stapf. Ir-Tur

Digitaria sanguinalis (L.) Scop.
Echinaria capitata (L.) Scop.
Echinochloa colonum (L.) Link
Eromopoa songarica (Schrenk) Roshev. Ir-Tur
Festuca adanensis Markgr.-Dannenb. End
F. jeanpertii (St.-Yves) F. Markgraf apud Hayek ssp. *jeanpertii* (St.-Yves) f. Markgraf apud Hayek Med.
Hordeum bulbosum L.
Hyparrhenia hirta (L.) Stapf.
Lolium rigidum Gaudin var. *rigidum*
Melica eligulata Boiss. Med.
M. minuta L. Med.
M. uniflora Retz Euro-Sib
Paspalum paspaloides (Michx.) Schribner
Phleum montanum C. Koch ssp. *montanum*
Phragmites australis (Cav.) Trin. Ex Steudel Euro-Sib
Piptatherum coerulescens (Desf.) P. Beauv.
Poa annua L. Cosmp.
P. bulbosa L.
P. nemoralis L.
P. timoleontis Heldr. ex Boiss. Med.
Saccharum ravennae (L.) Murray
S. strictum (Host) Sprengel
Sorghum halepense (L.) Pers. var. *halepense* Steudel
Stipa holosericea Trin Ir-Tur
Themeda triandra Forsskal.
Tragus racemosus (L.) All.
Vulpia fasciculata (Forsskal) Fritsch Med.

Polygalaceae
Polygala comosa Schkur
P. supina Schreb.

Polygonaceae
Polygonum arenarium Euro-Sib
P. aviculare L. Cosm.
P. convolvulus L.
P. persicaria L.
P. polycnemoides Saub. & Spach Ir-Tur
Rumex acetosella L. Cosm.
R. angustifolius Campd. ssp. *angustifolius* Ir-Tur
R. chalepensis Miller
R. conglomeratus Murray
R. pulcher L.

Polypodiaceae
Polypodium australe Fee.
P. vulgare L. ssp. *vulgare*

Portulacaceae
Portulaca oleracea L.
Primulaceae
Anagallis arvensis L. var. *caerulea* (L.) Gouan
Cyclamen coum Miller var. *coum*
Primula vulgaris Huds. ssp. *vulgaris* Euro-Sib
Punicaceae
Punica granatum L.
Raflesiaceae
Cytinus hypocistis L. ssp. *kermesinus* (Guss.) Waldts. Med.
Ranunculaceae
Adonis annua L.
Clematis flammula L. Med.
C. vitalba L.
Ranunculus chius DC.
R. cuneatus Boiss.
Thalictrum orientale Boiss. Med.
Rhamnaceae
Paliurus spina-christi Miller
Rhamnus alaternus L. Med.
R. libanoticus Boiss.
R. punctatus Boiss. var. *angustifolius* Post Med.
Rosaceae
Cerasus prostrata (Lab.) Ser. var. *prostrata*
Cotoneaster nummularia Fisch.& Mey.
Crateagus atrosanguinea Pojark. Ir-Tur
C. monogyna Jacq. ssp. *azarella* (Gris.) France
C. monogyna Jacq. ssp. *monogyna*
C. orientalis Pallas ex Bieb. var. *orientalis*
Fragaria vesca L.
Geum urbanum L. Euro-Sib
Malus sylvestris Miller ssp. *orientalis* (A. Uglitz.) Browicz var. *orientalis*
Potentilla aucheriana Th. Wolf Ir-Tur
P. calycina Boiss. and Bal. Med. End
Potentilla crantzii (Crantz) G. Beck ex Fritsch var. *crantzii* (Crantz) G. Beck ex Fritsch Euro-Sib
P. kotschyana Fenzl Med.
P. micrantha Remond ex DC.
P. speciosa Willd. var. *discolor* Hal.
Prunus divaricata Ledeb. ssp. *divaricata*
P. spinosa L. ssp. *dasyphylla* (Schur) Domin Euro-Sib
Pyracantha coccinea Roemer
Pyrus syriaca Boiss. var. *syriaca*
Rosa canina L.
R. pulverulenta Bieb.

Rubus sanctus Schreber
R. canescens DC. var. *glabratus* (Godron) Davis et Meikle Euro-Sib
Sanguisorba minor Scop. ssp. *muricata* (Spach) Briq.
Sorbus torminalis (L.) Crantz. var. *torminalis* Euro-Sib
S. umbellata (Desf.) Fritsch var. *cretica* (Lindl.) Schn.

Rubiaceae
Asperula cymulosa (Post) Post Med. End
A. pontica Boiss. Euro-Sib
A. stricta Boiss. ssp. *monticola* Ehrend. Med. End
A. stricta Boiss. ssp. *stricta* Med.
Crucianella latifolia L. *Med.*
Cruciata laevipes Opiz Euro-Sib
C. taurica (Pallas ex Willd.) Ehrend. Ir-Tur
Galium album Miller ssp. *amani* Ehrend. et Schönb.-Tem.
G. aparine L.
G. incanum Sm. ssp. *elatius* (Boiss.) Ehrend. Ir-Tur
G. odoratum (L.) Scop. Euro-Sib
G. tenuissimum Bieb. ssp. *tenuissimum*
G. verum L. ssp. *verum* Euro-Sib
Putoria calabrica (L. fil.) DC. Med.
Rubia rotundifolia Banks & Sol. Med.
R. tenuifolia d. Urv. ssp. *brachypoda* (Boiss.) Ehrend. Med.
Sherardia arvensis L.

Salicaceae
Populus tremula L. Euro-Sib
Salix alba L. ssp. *micans* (Anderson) Rech. fil. Euro-Sib
S. pedicellata Desf. ssp. *pedicellata* Med.

Santalaceae
Osyris alba L. var. *serotinia* Griseb. Med.
Thesium bergeri Zucc. Med.

Scrophulariaceae
Anarrhinum orientale Bentham Ir-Tur
Bellardia trixago (L.) All.
Kickxia commutata (Bernh. ex Reichb.) Frit. ssp. *graeca* (Bor & Chamb.) R. Fernand.
Lesquereuxia syriaca Boiss. & Reuter Med.
Linaria chalepensis (L.) Miller var. *chalepensis* Med.
Misopates orontium (L.) Rafin.
Scrophularia scopolii (Hoppe ex) Pers. var. *scopolii*
S. xanthoglossa Boiss. Ir-Tur
Verbascum amanum Boiss. Med.
V. caesareum Boiss. Med. End
V. cedreti Boiss. Med.
V. cheiranthifolium Boiss. var. *asperilum* (Boiss.) Murb. End
V. galileum Boiss. Med.

V. linearilobium (Boiss.) Hub.-Mor. Med. End
V. lydium Med.
V. sinuatum L. var. *adenosephalum* Murb. Med.
Veronica arvensis L. Euro-Sib
V. cymbalaria Bodard Med.
V. leiocarpa Boiss. Med.
V. orientalis Boiss. Miller ssp. *nimordi* (Reichter ex Stapf.) M.A. Fischer End
V. persica Poiret
Wulfenia orientalis Boiss. Med.
Sinopteridaceae
Cheilanthes marantae (L.) Domin
Solanaceae
Atropa belladonna L. Euro-Sib
Datura innoxia Miller
Physalis alkekengi L.
Solanum dulcamara L. Euro-Sib
S. elatum Moench
S. nigrum L. ssp. *nigrum* Cosm.
Staphylaceae
Staphylea pinnata L.
Styracaceae
Styrax officinalis L.
Tamaricaceae
Tamarix smyriensis Bunge
Taxaceae
Taxus baccata L.
Thymelaeceae
Daphne oleoides Schreb. ssp. *kurdica* (Bornm.) Bornm.
D. oleoides Schreb. ssp. *oleoides* Shreb.
D. sericea Vahl Med.
Tiliaceae
Tilia argentea Desf. Euro-Sib
Typhaceae
Typha angustifolia L.
Ulmaceae
Ulmus glabra Hudson Euro-Sib
Urticaceae
Parietaria judaica L.
Urtica dioica L. Euro-Sib
U. urens L.
Valerianaceae
Valeriana alliariifolia Adams
Verbenaceae
Phyla nodiflora (L.) Greene
Verbena officinalis L.

Vitex agnus-castus L. Med.
Violaceae
Viola alba Besser ssp. *dehnardtii* (Ten.) Becker
V. parvula Tineo
V. shieana Becker
Vitaceae
Vitis sylvestris Gmelin
Zygophyllaceae

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