

Flora of Grahovsko polje (Montenegro)

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Abstract

Investigations of the flora of Grahovsko polje were carried out in the period from February 2014 to September 2016. The collected plant material was analysed in terms of taxonomy, ecology and chorology. In the area of second largest karst field in Montenegro, 553 taxa of ranks species and subspecies were registered. The taxa are classified in 305 genera and 80 families. The results of the analysis of the flora show a significant presence of plant species from families Asteraceae (10.3%), Poaceae (9.9%) and Fabaceae (8%). The genera with the largest number of taxa are *Trifolium* and *Geranium* (1.8% each). In the biological spectrum hemicryptophytic and therophytic life forms are dominant (38.2% and 27.1%, respectively), while in terms of chorological structure, the most frequent appearance have species of Eurasian (41.4%) and Mediterranean-Submediterranean chorological type (32.9%). Endemic flora is presented with 3.8%, while alien flora is presented with 4.2% taxa. In the investigated area 20 species protected by law were registered.

Keywords: flora, Grahovsko polje, karst fields, Montenegro

Introduction

Until 2001, the data on the flora of arid karst fields of Montenegro, which includes Grahovsko polje, were very scarce. The first detailed studies of the flora of this special habitat type were carried out in the period from 1998 to 2000 and included karst fields in Piperi (Stešević, 2001). Reviewing the bibliography on floristic and vegetation research in Montenegro (Pulević 1980, Pulević 1985, Pulević et al. 2004, 2012), available literature references and herbarium materials, it can be concluded that the existing data on the plant life of Grahovsko polje were not the result of systematic research, but on occasional visits, mainly in the summer aspect of the flora. The oldest data on flora of Grahovsko polje dates from the end of XVIII and beginning of the XIX Century (e.g. Pantoczek, 1872, Pančić 1875, Adamović 1913) and they are all incorporated into Rohlena's Conspectus of the flora of Montenegro (1942). Taking into account its dimensions (the second largest karst field in

Montenegro), as well as the geographical position, the features of the soil substrate and climate, this area is separated as a specific object of researching the plant life richness and diversity. With the aim to supplement the literature and herbarium data on the diversity of the flora of Grahovo polje, as well as the flora of Montenegro in general, in February 2014 detailed research was started.

Grahovsko polje is located in the western part of Montenegro (Fig. 1), on the main road which is leading from Nikšić towards Risan and Boka Kotorska (Sinanović, 1959). The surface of Grahovsko polje is about 7.5 km² (Radulović, 1981). The altitude of its western part is 780m, while the altitude of almost the entire eastern part is 700m a.s.l. (Lazarević, 1949; Sinanović, 1959). The field is surrounded by limestone mountains, with heights range between 990m and 1830m a.s.l.. Considering humidity, it belongs to a group of arid karst fields without permanent watercourses (Sinanović, 1959).

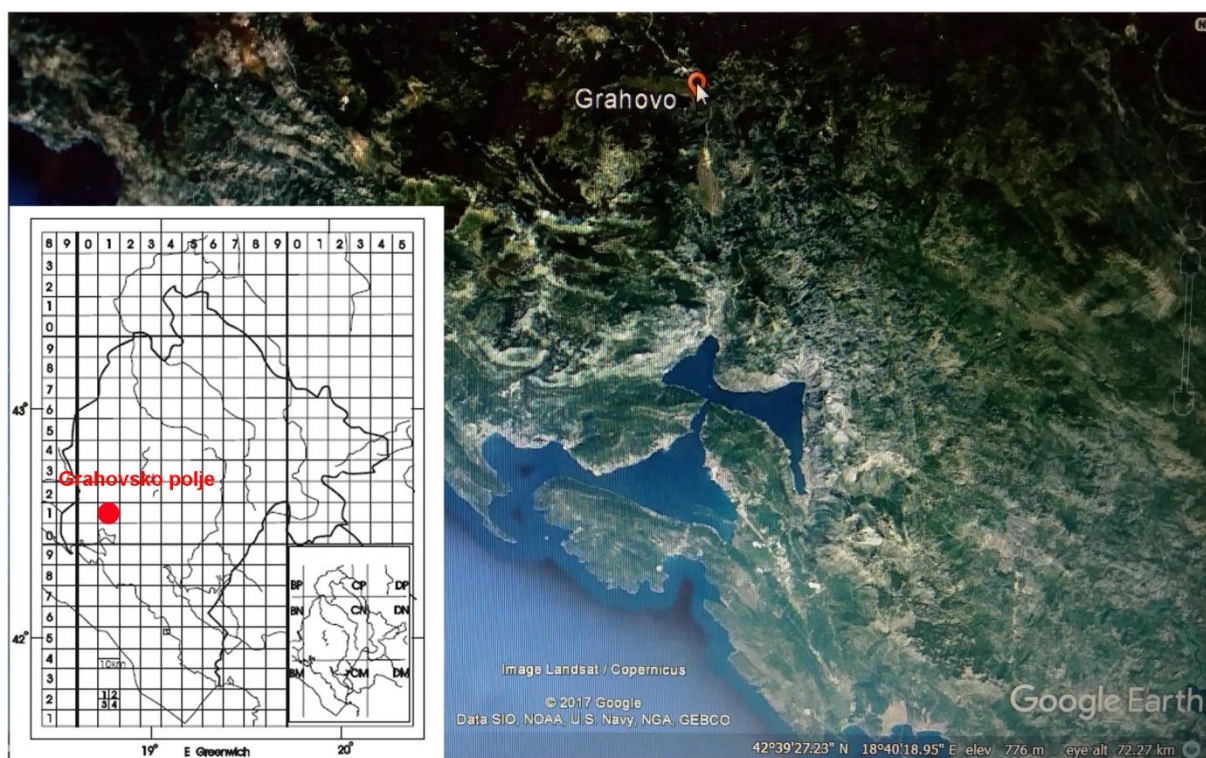


Figure 1. Geographic position of Grahovsko polje.

The geological substrate of the Grahovsko polje and its surroundings is presented with the sedimentary rocks of the Mesozoic and the Cenozoic age. Mesozoic age has been developed in all three periods, and is represented by dolomites, dolomite limestone, marlstone limestone, limestone and marl. The Cenozoic is represented by quaternary period, which consists of sediments of clay, gravel, sands, conglomerates and sandstones (Mitrović, 1996). Cretaceous masses build most of the periphery of Grahovsko polje, while the karst field is covered by fluvioglacial material (Sinanović, 1959).

The climate of the Grahovsko polje, depends on many factors, primarily on the distance of the sea and the altitude. The distance from the Risan Bay is only 6.5 km, which is why the influence of Adriatic Sea is very important. However, due to the relatively high altitude, these influences are highly modified. An important factor in the climate of the Grahovsko polje is the relief, which is especially visible from its

south side, where the mountain Orjen and its branches make it an obstacle to warm air masses from the area of Boka Kotorska (Mitrović, 1996). Based on Köppen classification, according to Burić & Micev (2008), Grahovsko polje is characterized by a Mediterranean climate with a warm summer, where the average monthly temperature of the hottest month is under 22 °C.

According to Fuštić *et al.* Djuretić (2000), three types of soil are present in the investigated area: rendzina, eutric brown soil-eutric cambisol and regosol.

Because of favorable climatic characteristics and the characteristics of the soil substrate, the agricultural potential of Grahovsko polje, has been known since ancient times (Sinanović, 1959). By building an artificial lake in the 1960s, the problem of irrigation of this area was solved, which enabled the development of agriculture (Radojičić, 2008).

Grahovsko polje is located in the zone of thermophilic deciduous forests, which are mostly built by *Carpinus orientalis*, *Quercus pubescens* and *Quercus cerris*. The forest types also include planted pine forest of *Pinus nigra*. The western part of the field is characterized by communities of xerophilic grasslands of the *Festuco-Brometea* class Br.-Bl. *et al.* Tx. ex Soó 1947, while in the eastern part prevail communities of the class *Molinio-Arrhenatheretea* Tx. 1937. Considering that a large part of the investigated area is cultivated, synanthropic communities of the classes *Polygono-Poetea annuae* Rivas-Mart. 1975, *Papaveretea rhoeadis* S. Brullo *et al.* 2001, *Chenopodietea* Br.-Bl. in Br.-Bl. *et al.* 1952.

Material and Methods

Systematic investigations of the flora of Grahovsko polje were carried out in the period from February 2014 to September 2016. The collected plant material is deposited in the Herbarium of Faculty of Natural Sciences and Mathematics, Department of Biology in Podgorica (TGU!). Identification is done according to: Pignatelli (1982), Tutin *et al.* (1964-1980, 1993), Conert *et al.* (1996), Domac (1973), Jäger *et al.* Werner (2013), Martinčić (2007), Ravnik (2002), Hackel (1882). The nomenclature is in accordance with the Euro+Med (2006-) and The Plant List (2013).

The classification of life forms is done according to the Raunkiaer (1934), which is modified by Mueller-Dombois & Ellenberg (1974) and Stevanović (1992a).

Data on geographical distribution and floral elements were used from different sources: Pignatelli (1982), Gajić (1984), Šilić (1990), Vuksanović (2016). The classification of floral elements into chorological types is done according to Stevanović (1992b).

The status of endemism is accorded to Šilić (1990) and Vuksanović (2016), while status of protection and IUCN categorization is given in accordance to "Official Gazette of the Republic of Montenegro" (76/06), Stevanović (1995), Petrović *et al.* Stešević (2010).

The checklist (Appendix 1) is given in alphabetical order of families. Actual name of the taxa is followed by possible synonyms used in the literature, an abbreviation of the life-form, floral element, status of protection and literature data.

In the calculation of the similarity index (Sørensen index) of the floras of Grahovsko polje and karst fields in Piperi following formula was used: $C_s = 2ab/(a+b)$. a- number of species of Grahovsko polje, b- number of species in karst fields in Piperi, ab- number of common species.

Results

The checklist of vascular plant species and subspecies of Grahovsko polje (Appendix 1) includes 553 taxa, classified in 305 genera and 80 families. In the taxonomical spectrum of families *Asteraceae* (10.3%), *Poaceae* (9.9%), and *Fabaceae* (8) prevail, while in the spectrum of genera: *Geranium* and *Trifolium* (1.8% each). Detailed taxonomical spectra of families and genera are given in Table 1.

Table 1. Families and genera with the largest number of representatives in the flora of Grahovsko polje

Family	No. of species and subspecies	% of total flora (No= 553)
<i>Asteraceae</i>	57	10.3
<i>Poaceae</i>	55	9.9
<i>Fabaceae</i>	44	8.0
<i>Lamiaceae</i>	34	6.1
<i>Rosaceae</i>	31	5.6
<i>Brassicaceae</i>	30	5.4
<i>Caryophyllaceae</i>	25	4.5
<i>Apiaceae</i>	19	3.4
<i>Ranunculaceae</i>	16	2.9
<i>Boraginaceae</i>	13	2.4
<i>Orchidaceae</i>	12	2.2
<i>Plantaginaceae</i>	12	2.2
<i>Orobanchaceae</i>	11	2.0
<i>Geraniaceae</i>	11	2.0
<i>Rubiaceae</i>	11	2.0
<i>Asparagaceae</i>	11	2.0
<i>Papaveraceae</i>	8	1.4
<i>Amaryllidaceae</i>	7	1.3
<i>Campanulaceae</i>	7	1.3
<i>Euphorbiaceae</i>	7	1.3
<i>Polygonaceae</i>	7	1.3
<i>Crassulaceae</i>	5	0.9
<i>Violaceae</i>	5	0.9
Genus		
<i>Geranium</i>	10	1.8
<i>Trifolium</i>	10	1.8
<i>Euphorbia</i>	7	1.3
<i>Silene</i>	7	1.3
<i>Vicia</i>	7	1.3
<i>Allium</i>	6	1.1

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<i>Campanula</i>	6	1.1
<i>Medicago</i>	6	1.1
<i>Ranunculus</i>	6	1.1
<i>Veronica</i>	6	1.1
<i>Centaurea</i>	5	0.9
<i>Galium</i>	5	0.9
<i>Poa</i>	5	0.9
<i>Prunus</i>	5	0.9
<i>Rosa</i>	5	0.9
<i>Sedum</i>	5	0.9
<i>Viola</i>	5	0.9

In the biological spectrum hemicryptophytic and therophytic life forms are dominant (Fig. 2), while in the chorological (Fig. 3) the Euroasian type prevails (41.47%), followed by the Mediterranean (32.9%).

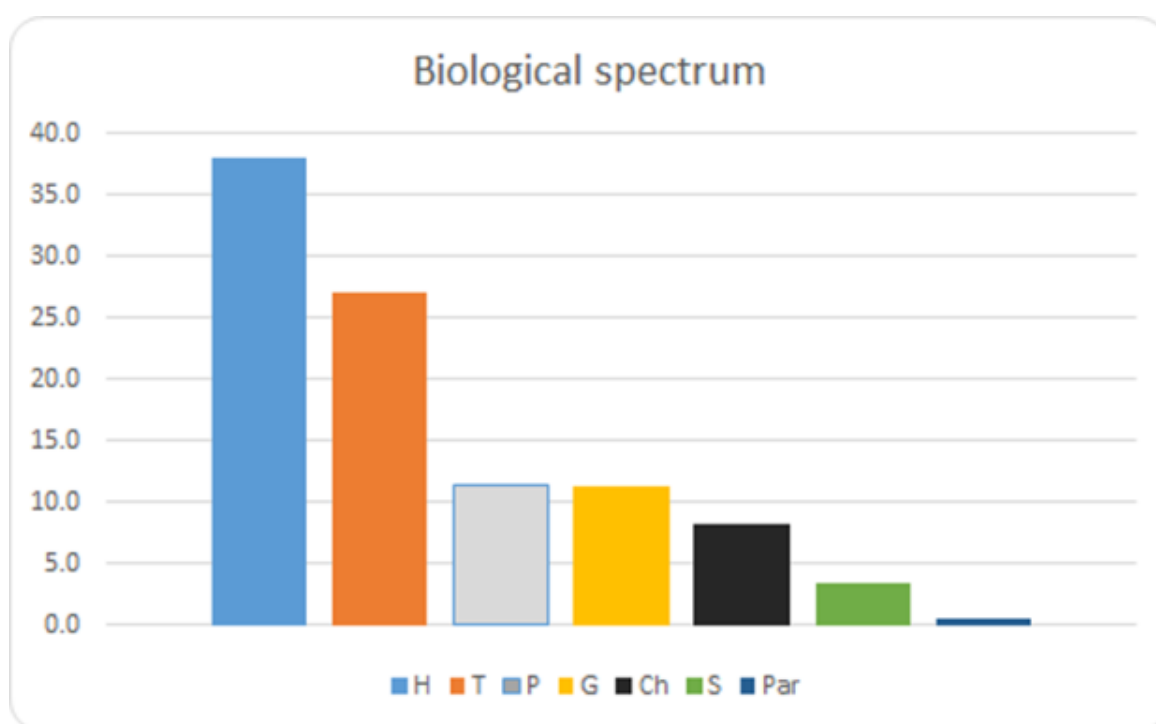


Figure 2. Biological spectrum of the flora of Grahovsko polje. H- hemicryptophyta, T- therophyta, P- phanerophyta, G- geophyta, Ch- chamaephyta, S- scandetophyta, Par- parasitophyta.

Endemic flora of Grahovsko polje is presented with 21 taxa (3.8%). Dominant are Dinaric endemics (e.g. *Edraianthus tenuifolius*, *Genista sylvestris* subsp. *dalmatica*, *Teucrium arduinii* etc.) and Illyrian ones (e.g. *Ruta patavina*, *Satureja subspicata*, *Crocus biflorus* subsp. *weldenii* etc.). Twenty plant species have status of national protection or international importance (*Anacamptis coriophora*, *Anacamptis pyramidalis*, *Anacamptis morio*, *Centaurea glaberima*, *Cephalanthera longifolia*,

Chaerophyllum coloratum, *Dactylorhiza fuchsii*, *Dianthus knappii*, *Galanthus nivalis*, *Hyacinthella dalmatica*, *Neottia ovata*, *Neotinea tridentata*, *Ophrys scolopax* subsp. *cornuta*, *Orchis provincialis*, *Orchis purpurea*, *Platanthera bifolia*, *Ruta patavina*, *Scilla lakusicii*, *Thymus bracteosus*, *Vincetoxicum huteri*. Participation of an alien component of the flora is 4.2%, while the share of invasive species is rather low (1.3%). In 2016 allergenic plant *Ambrosia artemisiifolia* is reported, but only several individuals, growing along the roadside. *Erigeron* species are commonly distributed, along the roadsides, disturbed areas and as weeds in crops.

Flora of Grahovsko polje is compared with the flora of arid kartst field in Piperi. The Sorensen's index showed similarity of 0.51

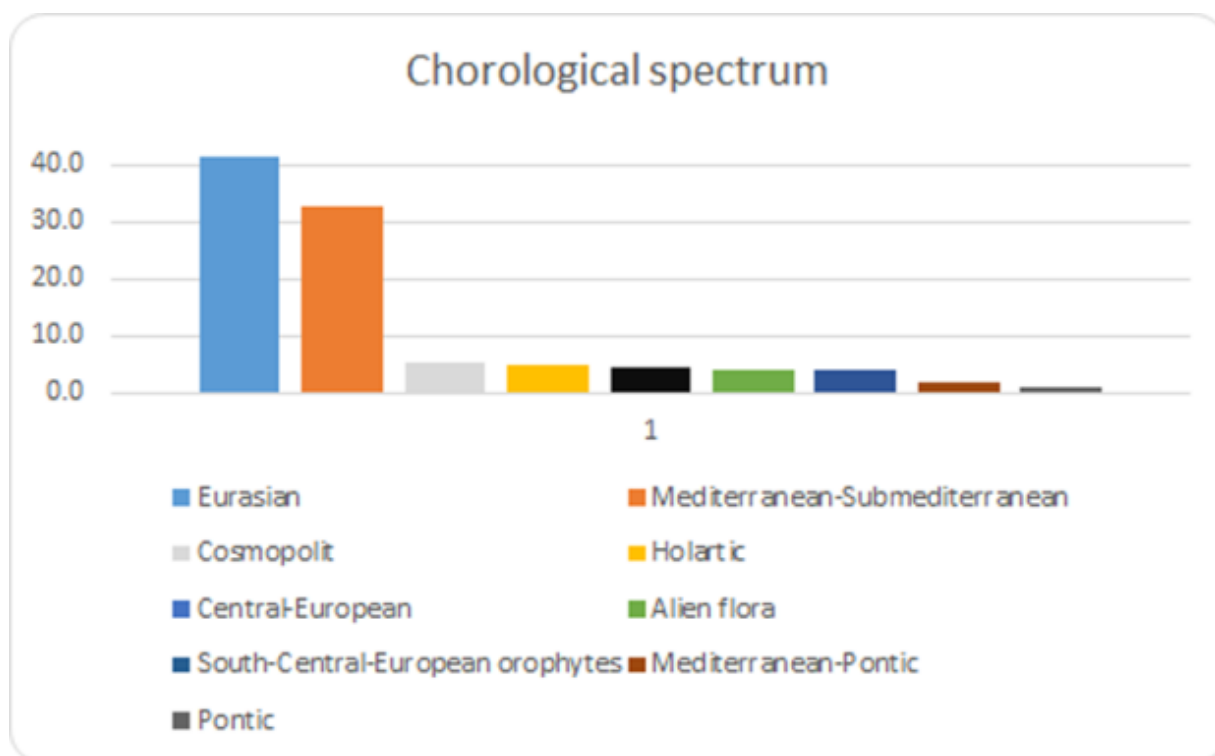


Figure 3. Chorological spectrum of the flora of Grahovsko polje.

Discussion

Number of species and subspecies reported for Grahovsko polje almost totally corresponds to the results of Stešević (2001). For the arid karts fields situated in Piperi: Radovče, Kopilje and Gostilje Martiničko, which covers an area of 7.6 km² the author reported ca. 550 species and subspecies. The taxonomical spectrum of dominant families and genera are rather similar and composed of representatives that mostly inhabit open and grassy habitats, such as meadows and habitats along the roads. Nevertheless, the species composition differs. The Sorensen's index showed similarity of 0.51. The flora of both areas have significant participation in hemicriptophytic life form, which reflects the impact of continentality. In the Piperi fields, hemicriptophytes/therophytes participate in the spectrum with 45.1/20.3%, while in Grahovo polje their share is 38.2/27.1%. A higher percent of therophytes in Grahovo is explained not only by the influence of Mediterranean climate, but also the amount of disturbance due to human activities. The fields in Piperi are poorly cultivated and

agricultural activities are minimized. Thanks to the newly constructed road, Grahovsko polje has started to be re-settled. Approximately 50% of the area is cultivated and used for agriculture. Cattle-breeding is also in expansion. Although such improvements are favorable for development of the economy, rapid landscape changes and intensive agricultural production might cause fragmentation or complete loss of natural habitats and endanger some threatened species. Habitat loss and fragmentation have long been considered the primary cause for biodiversity loss and ecosystem degradation worldwide (Wu 2013). Grahovsko polje is one of several localities in Montenegro, where *Ruta patavina* and *Orchis pallens* are reported. Both species are categorized as endangered (*Ruta patavina*- criteria B2ab(iii,v), *Orchis pallens*- criteria D; Petrović et Stešević, 2010). The first species is protected by national law, while the second one is proposed to be included in the list of plants protected by national law. Habitat lost due to the land cultivation is considered as a major threat to populations of both species. The biological value of Grahovsko polje is also increased by presence of 21 endemic species. According to recent study of Vuksanović et al. (2016) the Western subregion of Montenegro is characterized by 94 endemic taxa. Thus, 22.3% of the endemic flora of this subregion grows on such, rather small area.

Considering alien species, its number is still rather low, but the appearance of some invasive plants like *Ambrosia artemisiifolia*, *Erigeron annuus*, *E. canadensis* etc, should be recognized as an alarm. Alien plants tend to thrive in nutrient-rich and man-made habitats (Chytrý et al. 2008), thus if the landscape changes of Grahovsko polje continue, its participation from floristic point of view will probably increase.

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Appendix 1. The checklist of vascular plant species and subspecies. Actual name of the taxa is followed by possible synonyms used in the literature, bbreviation of the life-form, floral element, status of protection and literature data where this species was mentioned for Grahovsko polje.

fam: ACANTHACEAE

Acanthus hungaricus (Borbás) Baen. (= *Acanthus longifolius* Host; *Acanthus balcanicus* Heywood & I. Richardson); a Mes-Meg H scap; balk (Adamović, 1913)

fam: AMARANTHACEAE

Amaranthus hybridus L.; a Mes-Meg T scap; ADV(neotrop)

fam: AMARYLLIDACEAE

Allium carinatum subsp. *pulchellum* (G. Don) Bonnier & Layens (= *Allium pulchellum* G. Don; *Allium fuscum* Schrad. ex Hornem.); a Mes-Meg G bulb scap; med(mo)

Allium flavum L.; a Mes-Meg G bulb scap; eurimed

Allium guttatum subsp. *dalmaticum* (A. Kern. Ex Janch.) Stearn (= *Allium dalmaticum* A. Kern. Ex Janch.); a Mes-Meg G bulb scap; balk

Allium moschatum L.; a Mes G bulb scap; se.eu

Allium scorodoprasum L.; a Mes-Meg G bulb scap; eurimed-s.or

Allium sphaerocephalon L. ; a Mes-Meg G bulb scap; paleotemp

Galanthus nivalis L.; n-v Mes G bulb scap; eu-cauc

fam: APIACEAE

Anthriscus sylvestris (L.) Hoffm.; a Meg Alt H scap; paleotemp

Bunium alpinum subsp. *montanum* (W. D. J. Koch) P. W. Ball (= *Bunium montanum* W. D. J. Koch); a Mi G bulb scap; JEP

Bupleurum praedaltum L.; A Mi-Mes T scap; se.eu

Bupleurum veronense Turra; a Mes T scap; eurimed

Chaerophyllum aromaticum L.; a Mes-Meg H scap; se.eu-c.eu

Chaerophyllum coloratum L.; a Mes-Meg T scap; dinar

Chaerophyllum nodosum (L.) Crantz (= *Physocaulis nodosus* (L.) W. D. J. Koch); a Meg-Alt T scap; stenomed

Chaerophyllum temulum L.; a Mes-Meg T scap; euras

Daucus carota L. subsp. *carota*; a Mes-Meg H scap bienn; euras

Dichoropetalum schottii (DC.) Pimenov & Kljuykov (= *Peucedanum schottii* DC.); a Meg H scap; se.eu

Eryngium amethystinum L.; a Mes H scap; s.i.med (Pančić, 1875)

Heracleum sphondylium L. subsp. *sphondylium*; a Alt H scap; paleotemp

Orlaya daucorlaya Murb; a Mes-Mac T scap; e.med

Peucedanum oreoselinum (L.) Moench; a Meg H scap; eu-cauc

Pimpinella saxifraga L.; a Mes-Meg H scap; evreu-cauc

Seseli montanum subsp. *tommasinii* (Rchb. f.) Arcang. (= *Seseli tommasinii* Rchb. f.); a Mes-Meg H scap; ilir-adriat

Smyrniurn perfoliatum L.; v-a Mes-Meg H scap bienn; eurimed

Tordylium maximum L.; a Mes T scap; eurimed

Torilis arvensis (Huds.) Link subsp. *arvensis*; a Mes T scap; cosm

fam: APOCYNACEAE

Vinca minor L.; fo semp Mes-Meg Ch herb rept; c.eu-cauc

fam: ARACEAE

Arum orientale M. Bieb. subsp. *orientale* (= *Arum petteri* Schott); v Mes G rhiz; balk

fam: ARALIACEAE

Hedera helix Lowe subsp. *helix*; semp S lig; submedit-subatl

fam: ARISTOLOCHIACEAE

Aristolochia pallida Willd. subsp. *pallida*; v Mes G tub scap; eurimed

Asarum europaeum subsp. *italicum* Kukkonen & Uotila; v Mi Ch herb rept; eurosib

fam: ASCLEPIADACEAE

Vincetoxicum huteri Vis. & Asch. (= *Cynanchum huteri* (Vis. & Asch.) K. Schum.); v-a Mes H scap; balk

fam: ASPARAGACEAE

Hyacinthella dalmatica Chouard; v Mi G bulb scap; adriat

Leopoldia comosa (L.) Parl. (= *Muscari comosum* (L.) Mill.); v-a Mes G bulb scap; eurimed

Muscari botryoides (L.) Mill.; v Mi-Mes G bulb scap; submed

Muscari racemosum Mill.; v Mes G bulb scap; eurimed-turan

Ornithogalum comosum L.; a Mi-Mes G bulb scap; med(mo)

Ornithogalum gussonei Ten. (= *Ornithogalum tenuifolium* Guss.); v Mi G bulb scap; stenomed

Ornithogalum sphaerocarpum A. Kern.; a Alt G bulb scap; se.eu

Ornithogalum umbellatum L.; v Mi G bulb scap; eurimed

Polygonatum multiflorum (L.) All.; a Meg G rhiz scap; EURAS

Prospero autumnale (L.) Speta (= *Scilla autumnalis* L.); aut Mi G bulb scap; eurimed

Scilla lakusicii Šilic; a Mes G bulb scap; dinar

fam: ASPLENIACEAE

Asplenium ceterach L. (= *Ceterach officinarum* Willd.); poik H ros; se.eu

Asplenium ruta-muraria L.; semp H ros; circbor

Asplenium trichomanes L.; semp H ros; cosm

fam: ASTERACEAE

Achillea millefolium L.; a Meg H scap; cirkumholark (Pančić, 1875)

Achillea nobilis L.; a Mes-Mac H scap; s.eu-s.sib

Ambrosia artemisiifolia L.; a Mes-Mac T scap; ADV(SAM)

Anthemis arvensis L. subsp. *arvensis*; v-a Mi T scap; cosm

Arctium minus (Hill) Bernh.; a-aut Mes-Meg H scap bienn; eu-eurimed

Artemisia verlotiorum Lamotte; a-aut Meg-Alt H scap; or

Bellis perennis L.; v-aut Mi H ros; cosm

Carduus collinus subsp. *cylindricus* (Borbás) Soó; a Meg-Alt H scap bienn; SEP

Carduus nutans L. subsp. *nutans*; a Meg-Alt H scap bienn; z.evr

Carlina corymbosa L.; a Mes-Mac H scap, stenomed (Pančić, 1875)

Centaurea deusta Ten. (= *Centaurea deusta* subsp. *concolor* (DC.) Hayek); a Mes-Meg H scap bienn, apen-balk

Centaurea jacea subsp. *angustifolia* (DC.); a Meg H scap; med-pont

Centaurea glaberrima Tausch; a Meg H scap, adriat

Centaurea melitensis L.; a Mes T scap; j-medit

Centaurea scabiosa L.; a Meg-Alt H scap; EURAS

Chondrilla juncea L.; a Meg H scap; eurimed-s.sib

Cirsium eriophorum (L.) Scop. (= *Cirsium eriophorum* subsp. *velenovskii* (Vandas) Petr.); a Meg-Alt H scap bienn; c.s.eu

Cichorium intybus L.; a-aut Meg-Alt H scap; cosm (Adamović, 1913)
Crepis neglecta L. subsp. *neglecta*; v-a Mi-Mes T scap; eurimed-s.or
Crepis foetida subsp. *rhoeadifolia* (M. Bieb.) Čelak.; a Mes-Meg T scap; se.eu-s.sib
Crepis sancta (L.) Bornm. (= *Lagoseris sancta* subsp. *bifida* (Vis.) Hayek); v Mi-Mes T scap; EURAS (Adamović, 1913)
Crepis setosa Haller f.; v-a Mes T scap; eurimed-or (Adamović, 1913)
Cyanus segetum Hill (= *Centaurea cyanus* L.); a Meg T scap; stenomed (Pančić, 1875)
Erigeron annuus (L.) Desf.; a Mes-Meg T scap; ADV(NAM)
Erigeron annuus subsp. *septentrionalis* (Fernald & Wiegand) Wagenitz a Mes-Meg T scap; ADV(NAM)
Erigeron canadensis L.; a-aut Meg-Alt T scap; cosm (Adamović, 1913)
 NAM)
Eupatorium cannabinum L. ; a Meg-Alt H scap; paleotemp
Filago germanica (L.) Huds.; a Mi-Mes T scap; paleotemp
Galinsoga parviflora Cav.; a-aut Mes T scap; ADV(SAM)
Helianthus tuberosus L.; a-aut Alt G tub scap; ADV(NAM)
Hieracium macrodon Nägeli & Peter; a Mes H ros;
Hypochaeris radicata L.; v-a Mes-Meg H ros; eu-cauc
Inula conyzae (Griess.) DC.; a-aut Mes-Meg H scap bienn; SE-z.as
Inula oculus-christi L.; a Mes H scap; se.eu-pont
Inula salicina L.; a-aut Mes-Meg H scap; eu-cauc
Lactuca muralis (L.) Gaertn. (= *Mycelis muralis* (L.) Dumort.); a Mes-Meg H scap; eu-cauc
Lactuca serriola L.; a Mes-Meg H scap bienn; eurimed-s.sib
Lactuca viminea (L.) J. Presl & C. Presl; a Mes-Meg H scap bienn; eurimed-w.as
Lapsana communis L.; a Meg Alt T scap; paleotemp (Adamović, 1913)
Leontodon crispus Vill. ; v-a Mes H ros; s.eu
Leontodon hispidus L.; v-a Mes-Meg H ros; c.eu
Leucanthemum vulgare (Vaill.) Lam. ; v-aut Mes-Meg H scap; eurimed
Onopordum acanthium L.; a Meg-Alt H scap bienn; i. med-turan
Onopordum illyricum L.; a Meg-Alt H scap; stenomed
Picris hieracioides L. subsp. *hieracioides* ; a-aut Mes-Meg H scap; eu-sib
Picris hieracioides subsp. *spinulosa* (Guss.) Arcang.; a-aut Mes-Meg H scap; s.eu-w.as
Pilosella bauhini (Schult.) Arv.-Touv. (= *Hieracium bauhini* Schult.); a Mac-Meg H rept; se.eu-s.sib
Pilosella hoppeana subsp. *testimonialis* (Peter) P. D. Sell & C. West; a Mi-Mes H ros; s.eu (orof)
Ptilostemon strictus (Ten.) Greuter (= *Cirsium strictum* (Ten.) Link) ; a Mes H scap; se.eu
Scorzonera doriae Degen & Bald.; a Mes H scap; s.w.balk
Scorzonera villosa Scop.; a Mes H scap; ilir-apen
Senecio vulgaris L. ; v-aut Mi-Mes T scap; eurimed (Pančić, 1875)
Sonchus asper (L.) Hill ; v-a Meg-Alt T scap ; euras
Sonchus oleraceus L.; a Mes-Alt T scap; euras
Taraxacum officinale agg.; v-a Mes H ros; circumbor (Pančić, 1875)
Tragopogon pratensis subsp. *orientalis* (L.) Čelak.; v-a Mes H scap; euras

Tripleurospermum inodorum (L.) Sch. Bip. (= *Matricaria inodora* L.); v-a Mes T scap; s.eu

fam: BERBERIDACEAE

Berberis vulgaris L. ; fo dec N P caesp; euras

Mahonia aquifolium (Pursh) Nutt.; fo dec N P caesp; adv (nam)

fam: BORAGINACEAE

Anchusa officinalis L.; v-a Mes-Mac H scap ; pont

Anchusella cretica (Mill.) Bigazzi & al. ; v Mi-Mes T scap; stenomed-s. or

Buglossoides incrassata (Guss.) I. M. Johnst. subsp. *incrassata*; v-a Mi-Mes T scap; med(mo)

Buglossoides purpureocaerulea (L.) I.M.Johnst.; v-a Mes-Mac Ch suffr caesp; j. eu-pont

Cynoglossum creticum Mill.; a Mes H scap ; eurimed

Cynoglossum officinale L. ; v-a Mes-Mac H scap bienn; euras

Echium italicum L.; a Meg-Alt H semiros; eurimed (Pančić, 1875)

Echium vulgare L. ; a Mes-Meg H semiros; evr

Heliotropium europaeum L.; a-aut Mes T scap; eurimed-turan (Pančić, 1875)

Myosotis sylvatica Hoffm. (= *Myosotis myriantha* Domin); v-a Mes H scap ; paleotemp

Onosma arenaria Waldst. & Kit.; a Mes Ch suffr caesp; w.alp

Onosma echioides (L.) L. ; a Mes Ch suffr caesp; se.eu

Symphytum tuberosum L. ; v-a Mes G tub scap; se.eu

fam: BRASSICACEAE

Aethionema saxatile (L.) W. T. Aiton ; v-a Mes Ch suffr caesp; med(mo) (Adamović, 1913)

Alliaria petiolata (M. Bieb.) Cavara & Grande (= *Alliaria officinalis* M. Bieb.); v-a Meg H scap bienn; paleotemp

Alyssum alyssoides (L.) L. (= *Alyssum campestre* (L.) L.); v Mi-Mes T scap; eurimed

Alyssum montanum L.; v Mi-Mes Ch suffr caesp; pont-c.eu

Alyssum simplex Rudolphi ; v Mi T scap; med-turan

Arabis collina Ten. (= *Arabis muralis* Bertol.); v-a Mi-Mes H scap; med (mo)

Arabis sagittata (Bertol.) DC. (= *Arabis hirsuta* subsp. *sagittata* (Bert.) Rchb.; *Arabis hirsuta* var. *sagittata* (Bertol.) DC.); v-a Mac-Meg H semiros; se.eu

Arabis turrita L.; v-a Meg H scap-bienn; s.eu

Berteroa mutabilis (Vent.) DC.; a-aut Mac H scap; ne.med

Brassica nigra (L.) W. D. J. Koch; a Meg-Alt T scap; med

Brassica rapa (L.) L. (= *Brassica campestris* L.); v-a Meg-Alt H scap bienn; med (Pančić, 1875)

Bunias erucago L.; v-a Mes T scap; s.(euri)med (Pančić, 1875)

Capsella bursa-pastoris (L.) Medik.; v-a Mi-Mac T ros; cosm (Adamović, 1913)

Capsella rubella Reut.; v-a Mi-Mes T ros; eurimed

Cardamine glauca DC. ; v Mi-Mes H scap; s. med (mo)

Cardamine hirsuta L.; v Mi-Mes T scap; cosm

Draba muralis L.; v Mes T semiros; circumbor

Diplotaxis tenuifolia (L.) DC.; v-a Mes H semiros; submed-subatl

Erophila verna (L.) Chevall. (= *Draba verna* L.); v N-Mi T ros; circumbor

Erysimum odoratum Ehrh. (= *Erysimum sylvestre* subsp. *cheiranthus* Schinz & Thell.); v-a Mes-Mac H scap; c.eu

Hesperis matronalis L. subsp. *matronalis*; v-a Alt H scap; pont

Hornungia petraea (L.) Rchb.; v N-Mi T semiros; eurimed
Microthlaspi perfoliatum (L.) F. K. Mey. (= *Thlaspi perfoliatum* L.); v-a Mes T scap; paleotemp
Raphanus raphanistrum subsp. *landra* (DC.) Bonnier & Layens; v-a Meg T scap; eurimed
Raphanus raphanistrum L. subsp. *raphanistrum*; v-a Meg T scap; eurimed
Rorippa lippizensis (Wulfen) Rchb.; v-a Mi-Mes H scap; balk
Rorippa sylvestris (L.) Besser (= *Nasturtium sylvestre* (L.) R. Br.); v-a Meg H scap; euras (Pančić, 1875)
Sinapis alba L. subsp. *alba*; v-a Mes-Mac T scap; med-submed
Sinapis arvensis L.; v-a Mes T scap; stenomed
Sisymbrium officinale (L.) Scop. (= *Chamaeplium officinale* (L.) Wallr.); a Mes-Mac T scap; paleotemp

fam: CAMPANULACEAE

Campanula lingulata Waldst. & Kit.; a Mes H scap bienn; se.eu
Campanula patula L. (= *Campanula patula* subsp. *epigaea* (Degen) Hayek); a Mes H scap bienn; euras
Campanula persicifolia L.; a Mes H scap; euras
Campanula pyramidalis L.; a-aut Mes-Meg Ch suffr caesp; ilir
Campanula rapunculus L.; a Mes-Meg H scap bienn; paleotemp
Campanula trachelium L.; a Mac H scap; paleotemp
Edraianthus tenuifolius (Waldst. & Kit.) A. DC.; a Mi-Mes Ch suffr rept; dinar

fam: CANNABACEAE

Humulus lupulus L.; SH herb; eu-cauc

fam: CAPRYFOLIACEAE

Lonicera caprifolium L.; a S ligse. eu-(pont)

fam: CARYOPHYLLACEAE

Arenaria leptoclados (Rchb.) Guss.; v-a Mi T scap; paleotemp
Arenaria serpyllifolia L.; v-a Mi T scap; cirkholark; (Pančić, 1875)
Cerastium brachypetalum Pers. subsp. *brachypetalum*; v-a N-Mi T scap-semiros; med-submed
Cerastium brachypetalum subsp. *tauricum* (Spreng.) Murb.; v-a N-Mi T scap-semiros; med-submed
Cerastium ligusticum subsp. *trichogynum* (Möschl) P. D. Sell & Whitehead (= *Cerastium trichogynum* Möschl); v-a N-Mi T scap-semiros; med-submed
Cerastium semidecandrum L.; v-a N-Mi T scap-semiros; euras
Dianthus knappii (Pant.) Borbás; a Mes-Mac H scap; se.dinar (Pančić, 1875)
Dianthus sylvestris Wulfen subsp. *sylvestris*; v-a Mes-Mac H scap; s.eu(orof)
Herniaria glabra L.; a N Ch herb rept; euras (Pančić, 1875)
Minuartia verna subsp. *collina* (Neilr.) Domin (= *Minuartia verna* subsp. *montana* (Fenzl) Hayek); v-a Mi Ch herb pulv; s.eu(orof)
Moenchia mantica (L.) Bartl. subsp. *mantica*; v-a Mi-Mes T scap; s. med
Paronychia kapela (Hacq.) A. Kern. subsp. *kapela*; v-a Mi Ch herb rept; s.eu(orof)
Petrorhagia prolifera (L.) P. W. Ball & Heywood (= *Kohlrauschia prolifera* (L.) Kunth); v-a Mes T scap; eurimed (Adamović, 1913)
Petrorhagia saxifraga (L.) Link (= *Tunica saxifraga* (L.) Scop.); v-a Mes H caesp; eurimed (Adamović, 1913)

- Saponaria officinalis* L.; a Mac-Meg H scap; cirkholark (eu-sib)
Scleranthus annuus L. ; v-a Mi T scap; c.eu-med
Scleranthus verticillatus Tausch; a Mi T scap; c.eu– w.as
Silene conica L. subsp. *conica*; v-a Mi-Mes T scap; med-pont (paleotemp)
Silene coronaria (L.) Clairv. (= *Lychnis coronaria* (L.) Desr.); v-a Alt H scap; med – turan (Adamović, 1913)
Silene gallinyi Rchb. (= *Silene trinervia* Sebast. & Mauri); a Mes-Mac T scap; e.med (Pančić, 1875)
Silene italica (L.) Pers. ; v-a Mes-Mac H semiros; eurimed
Silene latifolia Poir. (= *Melandrium album* subsp. *eu-album* Hayek; *Melandrium pratense* (Rafn) Röhl.); v-a Meg H scap bienn; stenomed
Silene multicaulis Guss. subsp. *multicaulis*; a Mac H caesp; s.eu(orof)
Silene vulgaris (Moench) Garcke subsp. *vulgaris*; v-a Mac H scap; paleotemp (Adamović, 1913)
Stellaria media (L.) Cirillo subsp. *media*; v-aut Mi T rept ; cosm
fam: CELASTERACEAE
Euonymus europaeus L. (= *Euonymus vulgaris* Mill.) ; fo dec Mi P caesp; euras
fam: CHENOPODIACEAE
Atriplex patula L.; a-aut Meg T scap; circumbor (Pančić, 1875)
Chenopodium album L. ; a Meg T scap; cirkhol
fam: CISTACEAE
Fumana procumbens (Dunal) Gren. & Godr.; v-a Mes Ch suffr rept; eurimed-pont
Helianthemum oelandicum subsp. *italicum* (L.) Font Quer & Rothm. (= *Helianthemum italicum* (L.) Pers.); v-a Mes Ch suffr caesp; s.eu(orof)
Helianthemum ovatum Dun.; v-a Mes Ch suffr caesp; med-pont
fam: CLUSIACEAE
Hypericum perforatum L. ; a Mes-Meg H scap; paleotemp
fam: COLCHICACEAE
Colchicum haynaldii Heuff. (= *Colchicum visianii* Parl.) ; aut Mes G bulb scap; ilir-balk
fam: CONVULVACEAE
Convolvulus arvensis L.; a SG herb rhiz; paleotemp (Pančić, 1875)
Cuscuta europaea L.; ST Par; paleotemp
fam: CORNACEAE
Cornus mas L.; fo dec Mi P caesp; se.eu-pont (Pančić, 1875)
Cornus sanguinea L.; fo dec Mi-Mes P caesp; euras
fam: CORYLACEAE
Carpinus orientalis Mill. ; fo dec mi P caesp; submed-pont (Pančić, 1875)
Corylus avellana L.; fo dec Mi P caesp; eu-cauc
Ostrya carpinifolia Scop.; fo dec Mi-Mes P scap; circumbor
fam: CRASSULACEAE
Sedum acre L. ; v-a Mi Ch herb succ; eu-cauc
Sedum hispanicum L.; v-a Mi Ch herb succ; se.eu-pont
Sedum ochroleucum Chaix; a Mi-Mes Ch herb succ; s. medit (mo)
Sedum sexangulare L. (= *Sedum boloniense* Loisel.); a Mi Ch herb succ; c.eu
Sedum spurium M. Bieb. ; a Mi Ch herb succ; cauc
fam: CUCURBITACEAE

Bryonia cretica subsp. *dioica* (Jacq.) Tutin (= *Bryonia dioica* Jacq.); a SG tub herb; eurimed (Pančić, 1875)

fam: CUPRESSACEAE

Juniperus oxycedrus L.; ac semp N P caesp; eurimed

Platyclus orientalis (L.) Franco; ac semp Mes P scap; adv(as)

fam: CYPERACEAE

Carex caryophylla Latourr. (= *Carex verna* Chaix); v Mi G rhiz caesp; euras

Carex flacca Schreb. ; v-a Mes-Meg G rhiz caesp; evr

Carex liparocarpos Gaudin ; v-a Mes-Meg G rhiz caesp; s.eu-j. sib

Carex spicata Huds. (= *Carex configua* Hoppe); v-a Mes-Meg G rhiz caesp; euras

fam: DIOSCOREACEAE

Dioscorea communis (L.) Caddick & Wilkin (= *Tamus communis* L.); SG rhiz; eurimed

fam: DIPSACACEAE

Knautia integrifolia (Honck. ex L.) Bertol.; a Mi-Mes T scap; eurimed (Pančić, 1875)

Knautia purpurea (Vill) Borbás; a Meg H scap; w.med (mo)

Scabiosa triandra L.; a Meg H scap; s.eu

fam: DRYOPTERIDACEAE

Dryopteris pallida (Bory) Maire & Petitm. (= *Nephrodium villarii* subsp. *pallidum* (Bory) Hayek); a Meg G rhiz; eurimed

fam: EUPHORBIACEAE

Euphorbia barrelieri Savi; a Mi-Mes Ch suffr caesp; ne.med

Euphorbia cyparissias L.; v-a Mes-Mac H scap; c.eu (Pančić, 1875; Adamović, 1913)

Euphorbia falcata L.; a-aut Mi-Mes T scap; eurimed-turan

Euphorbia glabriflora Vis.; v-a Mi-Mes Ch frut caesp; balk

Euphorbia helioscopia L. ; v Mi-Mac T scap; cosm

Euphorbia platyphyllos L. ; v-a Mi-Mac T scap; eurimed

Euphorbia spinosa L.; v-a Mes Ch suffr pulv; s.med (Adamović, 1913)

fam: FABACEAE

Anthyllis vulneraria subsp. *polyphylla* (DC.) Nyman; a Mes H scap; se.eu-pont

Cytisus decumbens (Durande) Spach; a Mes Ch frut caesp; s.eu

Cytisus hirsutus L. (= *Cytisus hirsutus* subsp. *ciliatus* (Wahlenb.) Asch. & Graebn.; *Cytisus hirsutus* subsp. *leucotrichus* (Schur) Asch. & Graebn.); a Mes Ch frut caesp; cirkhol

Dorycnium pentaphyllum subsp. *herbaceum* (Vill.) Bonnier & Layens (= *Dorycnium herbaceum* Vill.); a Mes Ch suffr caesp; se.eu

Genista sericea Wulfen; a Mes Ch suffr caesp; ilir

Genista sylvestris subsp. *dalmatica* (Bartl.) H. Lindb.; a Mes Ch suffr caesp; dinar

Gleditsia triacanthos L.; fo dec Mes P scap; adv (nam)

Hippocrepis comosa L.; v-a Mes Ch suffr caesp; ce.eu

Hippocrepis emerus subsp. *emeroides* (Boiss. & Spruner) Lasse (= *Coronilla emerus* subsp. *emeroides* (Boiss. & Spruner) Holmboe); fo dec N P caesp; e.med-pont (Adamović, 1913)

Lathyrus latifolius L.(= *Lathyrus membranaceus* C. Presl; *Lathyrus megalanthus* Steud.); a Meg-Alt ST herb; s.eu

Lathyrus nissolia L.; v-a Mes T scap; eurimed

Lathyrus sphaericus Retz.; v-a Mes T scap; eurimed

Lathyrus venetus (Mill.) Wohlf.; v Mac H scap; pont

Lotus corniculatus L.; a Mes H scap; paleotemp

Medicago falcata L.; a Mes-Meg H scap; euras
Medicago lupulina L. ; a Mes-Mac T rept; paleotemp
Medicago minima (L.) L. (= *Medicago minima* var. *longiseta* DC.); a Mi T scap; eurimed-c.as
Medicago prostrata Jacq.; a Mes H rept; s.eu
Medicago rigidula (L.) All.; a Mi-Mes T rept; eurimed
Medicago sativa L. subsp. *sativa*; a Mes-Meg H scap; adv (as)
Melilotus officinalis (L.) Lam.; a Meg-Alt H scap bienn; euras
Onobrychis arenaria subsp. *tommasinii* (Jord.) Asch. & Graebn. (= *Onobrychis tommasinii* Jord.; *Onobrychis ocellata* Beck); a Mes-Mac H scap; s.eu-s.sib
Ononis spinosa L. subsp. *spinosa*; a Mes Ch suffr rept; eurimed
Petteria ramentacea (Sieber) C. Presl; fo dec Mi P caesp; ilir-balk (Pančić, 1875; Adamović, 1913)
Robinia pseudoacacia L.; fo dec Mes P scap; adv (nam)
Securigera varia (L.) Lassen (= *Coronilla varia* L.); a Mes H scap; se.eu
Trigonella balansae Boiss. & Reut. (= *Trigonella corniculata* (L.) L.); a Meg-Alt T scap; s.(steno)med
Trifolium alpestre L.; a Mes H scap; eu-cauc
Trifolium arvense L.; a Mes T scap; paleotemp
Trifolium campestre Schreb.; v-a Mi T scap; z.paleotemp
Trifolium dalmaticum Vis.; a Mi-Mes T rept; ilir-med
Trifolium incarnatum L. subsp. *incarnatum*; v Mes T scap ; eurimed
Trifolium montanum L. ; a Mes H scap; s.eu-pont
Trifolium nigrescens Viv. subsp. *nigrescens*; v Mi-Mes T scap; eurimed
Trifolium ochroleucon Huds.; a Mes H scap; pont-eurimed
Trifolium pratense L. ; a Mes H scap; eu-sib
Trifolium repens L.; a Mi-Mes H rept; paleotemp
Vicia cracca L. ; a Meg-Alt SH herb; euras
Vicia grandiflora Scop.; v Mes-Meg ST herb; s.eu-pont
Vicia ochroleuca subsp. *dinara* (Borbás) Rohlena; a Meg-Alt SH herb; w.med (mo)
Vicia onobrychioides L.; a Meg-Alt SH herb; med (mo)
Vicia pisiformis L.; a Meg-Alt SH herb; c.eu-cauc
Vicia sativa subsp. *nigra* (L.) Ehrh. (= *Vicia sativa* var. *nigra* L.; *Vicia sativa* subsp. *angustifolia* (L.) Batt.; *Vicia sativa* subsp. *cordata* (Hoppe) Batt.); v Mes ST herb; turan
Vicia tenuifolia Roth ; a Meg-Alt SH herb; euras (Pančić, 1875)

fam: FAGACEAE

Quercus cerris L. (= *Quercus cerris* var. *austriaca* (Willd.) Loudon); fo dec Mes P scap; s.eurimed
Quercus pubescens Willd.; fo dec Mes P scap; se.eu (Adamović, 1913)

fam: GENTIANACEAE

Centaurium erythraea Rafn; a Mi-Mes H semiros ; paleotemp (Adamović, 1913)
Centaurium pulchellum (Sw.) Druce; a Mi-Mes T semiros; paleotemp

fam: GERANIACEAE

Geranium columbinum L.; v Mi T scap; s.sib
Geranium dissectum L. (= *Geranium pusillum* R. Knuth); v Mi T scap; euras
Geranium lucidum L.; v Mi T scap; eurimed
Geranium macrorrhizum L.; a Mes-Mac G rhiz scap; s.eu(orof)

Geranium molle L. (= *Geranium villosum* Ten.); v Mi-Mes T scap; euras

Geranium purpureum Vill.; v Mes T scap; eurimed

Geranium pusillum L. ; v Mes T scap; eu-w.as

Geranium robertianum L.; v Mes T scap ; cosm

Geranium rotundifolium L.; v Mes T scap; paleotemp

Geranium sanguineum L.; v-a Mac H scap; eu-cauc (Adamovi, 1913)

Erodium cicutarium (L.) L'Hér. ; v Mi T caesp; cosm (Adamović, 1913)

fam: GLOBULARIACEAE

Globularia cordifolia L. (= *Globularia cordifolia* L. subsp. *cordifolia*); v-a Mi Ch suffr rept; s.eu(orof)

fam: GROSSULARIACEAE

Ribes rubrum L.; fo dec N P caesp; c.eu

fam: IRIDACEAE

Crocus biflorus subsp. *weldenii* (Hoppe & Fűrnr.) K. Richt. (= *Crocus weldenii* f. *lutescens* Pulevic); n-v Mi G tub scap; ilir

Crocus dalmaticus Vis.; n-v Mi G tub scap; dinar

Crocus tommasinianus Herb.; n-v Mi G tub scap; ilir-balk

Iris pseudopallida Trinajstić; v-a Meg G rhiz caesp; adriat (Note: The taxon is not included in the list Euro+Med (2006), while according The Plant List (2013) it has status "unresolved").

Iris reichenbachii Heuff.; v Mi G rhiz caesp; dinar

fam: JUGLANDACEAE

Juglans regia L.; fo dec Mes P scap; adv (as)

fam: JUNCACEAE

Luzula campestris (L.) DC.; v-a Mi-Mes H caesp; eu-cauc

Luzula multiflora (Ehrh.) Lej. (= *Luzula campestris* subsp. *multiflora* (Ehrh.) Schübl. & G. Martens); v-a Mes-Mac H caesp; holark

fam: LAMIACEAE

Ajuga chamaepitys (L.) Schreb. ; a Mi T scap; eurimed

Ajuga genevensis L.; v-a Mi-Mes H scap; euras

Ajuga reptans L.; v-a Mi-Mes H scap-rept; eu-cauc

Clinopodium acinos (L.) Kuntze (= *Calamintha acinos* (L.) Clairv.; *Acinos thymoides* Moench); a Mi-Mes T scap; eurimed (Pančić, 1875)

Clinopodium menthifolium (Host) Stace subsp. *menthifolium* (= *Calamintha sylvatica* Bromf.); a-aut Mes-Mac H scap; eu-cauc

Clinopodium nepeta (L.) Kuntze (= *Calamintha nepeta* (L.) Savi); a Mes-Mac H scap; (euri)med(mo)

Clinopodium vulgare L. (= *Calamintha vulgaris* (L.) Druce); a Mes-Mac H scap; circumbor

Lamium amplexicaule L.; v Mes T scap; paleotemp

Lamium bifidum Cirillo subsp. *bifidum* ; v Mes T scap; stenomed

Lamium maculatum (L.) L. (= *Lamium maculatum* var. *nemorale* Rchb.); v Mes-Mac H scap; euras

Lamium purpureum L. ; v Mes T scap; euras

Leonurus cardiaca L.; a Meg-Alt H scap; euras

Marrubium incanum Desr.; a Mes-Meg H scap; s.i.(euri)med

Mentha longifolia (L.) L. (= *Mentha longifolia* (L.) L. subsp. *longifolia*); a Mes-Meg H scap; paleotemp

Mentha spicata L. s.l.; a Mes-Meg H scap; eurimed
Origanum vulgare L. subsp. *vulgare* ; a Mes-Meg H scap; euras
Prunella laciniata (L.) L.; a Mi-Mes H scap; eurimed
Salvia officinalis L.; a Mes-Mac Ch suffr caesp; stenomed-or
Salvia verbenaca L.; a Mes H semiros ; med-atl
Salvia verticillata L. ; a Mes H semiros; s.eu-cauc
Satureja montana L.; a-aut Mes Ch suffr pulv; w.med(mo) (Pančić, 1875)
Satureja subspicata Bartl. Ex Vis. ; a-aut Mes Ch suffr pulv; ilir
Scutellaria altissima L.; a Mes-Meg H scap; se.eu-(pont)-(pann)
Stachys annua (L.) L.; a Mi-Mes T scap; eurimed
Stachys germanica L. subsp. *germanica*; a Meg H scap; med-pont
Stachys officinalis subsp. *serotina* (Host) Hayek; a Meg H scap; eu-cauc
Stachys recta subsp. *labiosa* (Bertol.) Briq.; a Mes-Mac H scap; s.eu(orof)
Teucrium arduinii L.; a Mes Ch suffr caesp; dinar (Pančić, 1875)
Teucrium capitatum L.; a Mes Ch suffr caesp; med-submed
Teucrium chamaedrys L. ; a Mi-Mes Ch suffr caesp; eurimed
Teucrium montanum L.; a Mi Ch suffr pulv; s.eu(orof)
Thymus bracteosus Vis. ex Benth.; a Mi Ch herb pulv; dinar
Thymus longicaulis C. Presl; v-a Mi-Mes Ch herb rept; eurimed
Thymus praecox subsp. *polytrichus* (A. Kern. ex Borbás) Jalas (= *Thymus balcanus* Borbás); v-a Mi-Mes Ch herb rept; s.eu(orof)

fam: LILIACEAE

Fritillaria messanensis subsp. *gracilis* (Ebel) Rix (= *Fritillaria gracilis* (Ebel) Asch. & Graebn.); v Mes G bulb scap; dinar
Lilium martagon L.; a Meg-Alt G bulb scap; euras (Pančić, 1875)

fam: LINACEAE

Linum austriacum L. ; v-a Mes-Mac H scap; med-submed
Linum tenuifolium L. ; v-a Mes Ch suffr caesp; submed-pont (Pančić, 1875)

fam: MALVACEAE

Alcea setosa (Boiss.) Alef.; a Alt H scap; adv (e.med)
Malva sylvestris L. (= *Malva ambigua* Guss.); a Meg H scap; cirkhol
Malva thuringiaca subsp. *ambigua* (DC.) Valdés (= *Lavatera ambigua* DC.); a Meg H scap; med-submed

fam: MORACEAE

Morus alba L.; fo dec Mes P scap; adv (or.as)

fam: OLEACEAE

Fraxinus angustifolia Vahl; fo dec Mes P scap; se.eu-(pont)
Fraxinus ornus L.; fo dec Mes P scap; s.eurimed-pont
Ligustrum vulgare L.; fo dec N P caesp; eu-w.as
Syringa vulgaris L.; fo dec Mi N caesp; s.eu(orof)

fam: ONAGRACEAE

Epilobium angustifolium L. (= *Chamaenerion angustifolium* (L.) Scop.); a Meg-Alt H scap; circbor

fam: ORCHIDACEAE

Anacamptis coriophora (L.) R. M. Bateman, Pridgeon & M. W. Chase (= *Orchis coriophora* L.; *Orchis coriophora* subsp. *fragrans* (Pollini) K. Richt.); v-a Mes G tub scap; eurimed

Anacamptis morio (L.) R. M. Bateman, Pridgeon & M. W. Chase (= *Orchis morio* L.); v-a Mes G tub scap; eu-cauc
Anacamptis pyramidalis (L.) Rich. (= *Anacamptis pyramidalis* subsp. *brachystachys* (d'Urv.) K. Richt.); a Meg G tub scap; eurimed
Cephalanthera longifolia (L.) Fritsch; a Mes G tub scap; euras
Dactylorhiza fuchsii (Druce) Soó; a Mes G tub scap; paleotemp
Neottia ovata (L.) Bluff & Fingerh. (= *Listera ovata* (L.) R. Br.); a Meg G rhiz scap; euras
Neotinea tridentata (Scop.) R. M. Bateman, Pridgeon & M.W.Chase (= *Orchis tridentata* Scop.); v Mes G tub scap; eurimed
Ophrys scolopax subsp. *cornuta* (Steven) E. G. Camus; v Mes G tub scap; se.eu
Orchis pallens L.; v Mes G tub scap; eu-cauc
Orchis provincialis Balb. Ex Lam. & DC.; v Mes G tub scap; stenomed
Orchis purpurea Huds. ; v Mes G tub scap; euras
Platanthera bifolia (L.) Rich.; v Meg G tub scap; paleotemp

fam: OROBANCHACEAE

Euphrasia liburnica Wettst.; a Mi T scap; eu-cauc
Euphrasia pectinata Ten.; v-a Mi T scap; med-submed
Melampyrum barbatum subsp. *carstiense* Ronniger; a Mes T scap; s.eu(orof)
Microrrhinum minus (L.) Fourr. (= *Chaenorhinum minus* (L.) Lange); v-aut Mi T scap; eurimed
Odontites luteus (L.) Clairv.; a Mes T scap; eurimed (Adamović, 1913)
Odontites vernus (Bellardi) Dumort. (= *Odontites ruber* subsp. *vernus* (Bellardi) Wettst.); a Mes T scap; euras
Orobanche caryophyllacea Sm.; v-a Mi-Mes Par G ; submed-subatl
Orobanche minor Sm.; v-a Mi-Mes Par G; paleotemp
Parentucellia latifolia (L.) Caruel; v Mi-Mes T scap; eurimed
Rhinanthus minor L. (= *Alectorolophus minor* (L.) Wimm. & Grab.); v-a Mes T scap; eu-amer
Rhinanthus rumelicus Velen. (= *Alectorolophus rumelicus* (Velen.) Borbás subsp. *rumelicus*); v-a Mes-Mac T scap; dac-balk

fam: PAPAVERACEAE

Chelidonium majus L.; v-a Mac-Meg H scap; euras
Corydalis cava (L.) Schweigg. & Körte subsp. *cava*; v Mes G bulb scap; eu-cauc
Corydalis pumila (Host) Rchb.; v Mi G bulb scap; c.eu
Corydalis solida subsp. *incisa* Lidén; v Mi-Mes G bulb scap; c.eu
Fumaria officinalis L. subsp. *officinalis*; v-a Mes T scap; paleotemp
Papaver apulum Ten.; v-a Mes T scap; ne.med
Papaver argemone L. ; v-a Mes T scap; med-turan
Papaver rhoeas L.; a Mes T scap; e.med

fam: PINACEAE

Cedrus atlantica (Endl.) Carrière; ac semp Mi P scap; adv(afr)
Pinus nigra J. F. Arnold; ac semp Mes P scap; adv (kult)

fam: PLANTAGINACEAE

Linaria vulgaris Mill. ; a Mes H scap; EURAS (Pančić, 1875)
Misopates orontium (L.) Raf.; v-aut Mes T scap; eurimed
Plantago holostium Scop. (= *Plantago carinata* Schrad. ex Mert. & W.D.J.Koch) ; a Mi-Mes H ros; se.eu

Plantago lanceolata L.; v-a Mes-Mac H ros; euras
Plantago major L. subsp. *major* ; a Mi-Mes H ros; cosm
Plantago media L.; v-a Mes-Mac H ros; euras
Veronica arvensis L.; v-a N T scap; cosm
Veronica austriaca subsp. *jacquinii* (Baumg.) Eb. Fisch.; v-a Mes H scap; se.eu
Veronica chamaedrys L. ; v-a Mes H scap; eu-sib
Veronica persica Poir.; v-aut Mi-Mes T rept ; euras
Veronica serpyllifolia L. ; v-a Mi-Mes H rept; circumbor
Veronica spicata L. subsp. *spicata*; a-aut Mes H scap; euras

fam: PLUMBAGINACEAE

Armeria canescens (Host) Boiss.; v-a Mes-Mac H ros; s.eu(orof)

fam: POACEAE

Achnatherum calamagrostis (L.) P. Beauv. (= *Lasiagrostis calamagrostis* (L.) Link.); a Meg H caesp; s.eu(orof)
Agrostis capillaris L. ; a Mes-Meg H caesp; circumbor
Agrostis castellana Boiss. & Reut. (= *Agrostis castellana* subsp. *byzantina* (Boiss.) Hack.); a Mes H caesp; eurimed-occid
Agrostis gigantea Roth; a Meg H caesp; circumbor
Agrostis stolonifera L.; a Mes H rept; circumbor
Aira elegans Gaudin; a Mes-Mac T scap; eurimed
Anisantha madritensis (L.) Nevski (= *Bromus madritensis* L.); a Mes-Meg T scap; eurimed
Anisantha sterilis (L.) Nevski (= *Bromus sterilis* L.); a Mes-Meg T scap; eurimed-turan
Anthoxanthum odoratum L.; a Mes H caesp; Euras
Arrhenatherum elatius (L.) J. Presl & C. Presl; a Alt H caesp; paleotemp
Avena sativa L. ; a Meg T scap; kult
Bothriochloa ischaemum (L.) Keng (= *Andropogon ischaemum* L.); a Alt H caesp; cosm (Pančić, 1875)
Brachypodium sylvaticum (Huds.) P. Beauv. ; a Mes-Meg H caesp; paleotemp
Briza media L. ; a Mes-Meg H caesp; eu-sib
Briza minor L.; a Mes-Meg T scap; cosm
Bromopsis condensata (Hack.) Holub (= *Bromus erectus* subsp. *condensatus* (Hack.) Asch. & Graebn.); a Mes-Mac H caesp; med-submed
Bromopsis erecta (Huds.) Fourr. (= *Bromus erectus* Huds.); a Mes-Mac H caesp; paleotemp
Bromopsis pannonica (Kumm. & Sendtn.) Holub ; a Mes-Meg H caesp; se.eu
Bromus hordeaceus L. (= *Bromus mollis* L.); a Mes T scap; cosm
Bromus hordeaceus subsp. *molliformis* (Billot) Maire & Weiller (= *Bromus molliformis* Billot); a Mes T scap; euromed
Bromus intermedius Guss.; a Mes T scap; euromed
Bromus squarrosus L. ; a Mes T scap; paleotemp
Catapodium rigidum (L.) C. E. Hubb.; v Mi T scap; eurimed
Cynosurus echinatus L.; a Mes T scap; eurimed
Dactylis glomerata L. ; a Meg H caesp; paleotemp
Dactylis glomerata subsp. *hispanica* (Roth) Nyman; a Meg H caesp; stenomed
Dasypyrum villosum (L.) P. Candargy (= *Triticum villosum* (L.) M. Bieb.; *Haynaldia villosa* (L.) Schur); a Mes-Meg T scap; eurimed-turan (Adamović, 1913)

Digitaria sanguinalis (L.) Scop. ; a Meg T caesp; cosm
Elymus caninus (L.) L. (= *Agropyron caninum* (L.) P. Beauv.); a Mes-Meg H caesp; circumbor
Elytrigia repens (L.) Nevski (= *Agropyron repens* (L.) P. Beauv.); a Mes-Meg G rhiz caesp; circumbor
Elytrigia intermedia subsp. *trichophora* (Link) Á. Löve & D. Löve; a Mes-Meg H scap; se.eu-s.sib
Festuca valesiaca Gaudin; a Mes H caesp; se.eu-s.sib
Koeleria pyramidata (Lam.) P. Beauv.; a Mes H caesp; s.eu-c.eu
Koeleria splendens C. Presl ; a Mes H caesp; med(mo)
Lolium multiflorum Lam. (= *Lolium multiflorum* subsp. *italicum* Schinz & R. Keller); a Mes-Meg T scap; eurimed
Lolium perenne L. ; a Mes H caesp; euras (Pančić, 1875)
Melica ciliata L. (= *Melica ciliata* subsp. *nebrodensis* (Parl.) Husn.); a Mes-Meg H caesp; eurimed-turan (Adamović, 1913)
Melica nutans L.; a Meg H caesp; eu-cauc
Melica uniflora Retz.; a Meg H caesp; paleotemp
Phleum echinatum Host; a Mes T caesp ; stenomedit-s.or (Pančić, 1875)
Phleum nodosum L.; a Mes-Meg H caesp; eurimed
Phleum pretense L. ; a Mes-Meg H caesp; c.eu
Poa angustifolia L. (= *Poa pratensis* subsp. *angustifolia* (L.) Dumort.); a Mes-Meg H caesp; euras
Poa bulbosa L.; a Mes H caesp; paleotemp
Poa compressa L.; a Mes H caesp; circumbor (Pančić, 1875)
Poa perconcinna J. R. Edm. (= *Poa bulbosa* subsp. *concinna* (Gaudin) Hayek); a Mes H caesp; s.eu(orof)
Poa trivialis subsp. *sylvicola* (Guss.) H. Lindb. (= *Poa sylvicola* Guss.); a Mes H caesp; eurimed
Schedonorus pratensis (Huds.) P. Beauv. (= *Festuca elatior* subsp. *pratensis* (Huds.) Hack.); a Mes H caesp; euras
Secale cereale L.; a Mes-Meg T scap ; kult (c.as)
Setaria viridis (L.) P. Beauv. ; a-aut Mes-Meg T caesp; cosm
Sorghum halepense (L.) Pers.; a-aut Meg-Alt G rhiz; cosm
Stipa pulcherrima K. Koch; a Meg H caesp; se.eu-s.sib
Triticum aestivum L. ; a Mes-Meg T scap; kult
Vulpia myuros (L.) C. C. Gmel.; a Mes T caesp; cosm

fam: POLYGALACEAE

Polygala monspeliaca L.; a Mi T scap; stenomed
Polygala nicaeensis subsp. *mediterranea* Chodat; v-a Mes H scap; med-submed
Polygala vulgaris L. ; v-a Mes H scap; euras

fam: POLYGONACEAE

Fallopia convolvulus (L.) Á.Löve (= *Fagopyrum convolvulus* (L.) Gross); a-aut Mes-Alt ST herb; circumbor
Persicaria maculosa Gray (= *Polygonum persicaria* L.); a-aut Mac T scap; cosm
Polygonum aviculare L.; a-aut Mi-Meg T rept; cosm
Rumex acetosella L.; a Mes-Mac H scap; cosm
Rumex crispus L.; a Meg-Alt H scap; cosm

Rumex patientia L.; a Alt H scap; i.eu-turan

Rumex pulcher L.; v-a Mes-Meg H scap ; eurimed

fam: PRIMULACEAE

Anagallis arvensis L.; v-aut Mi T rept; eurimed

Anagallis foemina Mill.; v-aut Mi T rept; stenomed

Primula acaulis (L.) L. subsp. *acaulis*; v Mi-Mes H ros; eu-cauc

Primula veris subsp. *columnae* (Ten.) Lüdi (= *Primula suaveolens* Bertol.); v Mes H ros; s.med(mo) (Adamović, 1913)

fam: RANUNCULACEAE

Anemone apennina L. ; v Mi-Mes G rhiz scap; se.eu

Clematis flammula L.; a S lig; eurimed

Clematis vitalba L.; a S lig; eu-cauc

Clematis viticella L.; a S lig; s.eu-c.as

Consolida regalis Gray ; a Mes-Mac T scap; med-submed

Delphinium fissum Waldst. & Kit.; a Meg-Alt G tub scap; euras (mo)

Ficaria verna Huds. ; v Mi G bulb scap; euras

Helleborus multifidus Vis.; v Mes-Mac G rhiz scap; ilir (Pančić, 1875)

Ranunculus arvensis L.; v Mes-Mac T scap; paleotemp

Ranunculus bulbosus L. subsp. *bulbosus*; v Mes H scap; EURAS

Ranunculus illyricus L.; v-a Mes-Mac G tub scap; se.eu-w.as

Ranunculus millefoliatus Vahl (= *Ranunculus garganicus* Ten.); v Mes G tub scap; med(mo)

Ranunculus neapolitanus Ten.; v-a Mes-Mac H scap; s.i.med

Ranunculus sardous Crantz; v-a Mes-Mac T scap; eurimed

Thalictrum aquilegiifolium L.; a Meg-Alt H scap; eu-sib

Thalictrum minus L. (= *Thalictrum elatum* Jacq.); a Meg-Alt H scap; euras

fam: RESEDCEAE

Reseda lutea L.; v-a Mes-Meg H scap; evr

Reseda phyteuma L. ; v-a Mi-Mes T scap; eurimed (Pančić, 1875)

fam: RHAMNACEAE

Frangula alnus Mill. (= *Rhamnus frangula* L.); fo dec Mi P caesp; c.eu-cauc

Rhamnus cathartica L.; fo dec Mi P caesp; s.eu-pont

Rhamnus saxatilis Jacq.; fo dec Mi P caesp; se.eu

fam: ROSACEAE

Agrimonia eupatoria L. subsp. *eupatoria*; a Meg H scap; cosm

Amelanchier ovalis Medik.; v-a N P caesp; med (mo)

Aremonia agrimonoides (L.) DC. ; v-a Mes H ros; s.i.med (mo)

Crataegus monogyna Jacq. (= *Crataegus insecnae* (Guss.) Bertol.); fo dec N P caesp; paleotemp (Pančić, 1875; Adamović, 1913)

Filipendula vulgaris Moench; a Meg H scap; c.eu-s.sib

Fragaria vesca L.; a Mes H rept, eu-sib

Geum urbanum L.; a Mes-Mac H scap; circumbor

Malus domestica Borkh.; fo dec Mes P scap; adv (kult)

Potentilla argentea L.; a Mes H scap; circumbor

Potentilla micrantha DC.; v Mi H ros; eurimed

Potentilla recta L.; a Mes H scap; s.i.med-pont

Potentilla reptans L.; a Mi-Mes H rept; paleotemp

Prunus avium (L.) L.; fo dec Mes P scap; pont
Prunus cerasifera Ehrh.; fo dec Mi P scap; w.as-pont
Prunus domestica L. ; fo dec Mes P scap; adv (kult)
Prunus mahaleb L.; fo dec N P caesp; s.eu-pont (Adamović, 1913)
Prunus spinosa L.; fo dec N P caesp; eu-cauc (Pančić, 1875)
Pyrus communis L. ; fo dec Mes P scap; kult (Pančić, 1875)
Pyrus communis subsp. *pyraster* (L.) Ehrh. (= *Pyrus pyraster* (L.) Burgsd.); fo dec Mi P scap; euras
Rosa agrestis Savi; fo dec N P caesp; eurimed
Rosa arvensis Huds. (= *Rosa sylvestris* Herm.); fo dec N P caesp; submed-subatl
Rosa canina L.; fo dec N P caesp; paleotemp
Rosa inodora Fr.; fo dec N P caesp; c.eu
Rosa corymbifera Borkh. (= *Rosa dumetorum* Thuill.); fo dec N P caesp; paleotemp
Rubus caesius L.; fo dec N P rept; euras
Rubus macrophyllus Weihe & Nees; fo dec N P caesp; SE
Rubus ulmifolius Schott; fo dec N P rept; eurimed
Sanguisorba minor subsp. *balearica* (Nyman) Muñoz Garm. & C. Navarro (= *Sanguisorba muricata* Greml.) v-a Mes H scap; paleotemp
Sorbus aria (L.) Crantz; fo dec N P caesp; paleotemp
Sorbus aucuparia L.; fo dec N P caesp; eu
Sorbus domestica L.; fo dec N P caesp; eurimed

fam: RUBIACEAE

Asperula aristata subsp. *scabra* (J. Presl & C. Presl) Nyman; a Mes-Meg H rept; med(mo)
Asperula cynanchica L. (= *Asperula cynanchica* var. *longiflora* Vis.); a Mes-Meg H rept; eurimed (Pančić, 1875)
Asperula purpurea (L.) Ehrend. (= *Galium purpureum* L.); a Mes-Meg Ch suffr caesp; s.eu(orof) (Adamović, 1913)
Asperula scutellaris Vis.; a Mes-Meg H caesp; adriat-ilir (Adamović, 1913)
Cruciata laevipes Opiz (= *Galium cruciata* (L.) Scop.); v-a Mes-Meg H rept; euras
Galium aparine L. ; v-a Mes-Meg ST herb; euras
Galium corrudifolium Vill. (= *Galium lucidum* subsp. *corrudifolium* (Vill.) Hayek); a Mes H caesp; stenomed
Galium mollugo L. (= *Galium mollugo* L. subsp. *mollugo* (L.) Hay); a Mes-Meg H rept; eurimed (Adamović, 1913)
Galium pseudaristatum Schur; a Mes-Meg H rept; i. submed
Galium verum L. subsp. *verum*; a Mes-Meg H scap; euras
Sherardia arvensis L.; v Mi T scap; eurimed (Pančić, 1875)

fam: RUTACEAE

Ruta graveolens L.; A Mac Ch suffr caesp; subpont
Ruta patavina L. (= *Haplophyllum patavinum* (L.) G. Don); a Mi-Mes Ch suffr caesp; ilir

fam: SALICACEAE

Populus tremula L.; fo dec Mes P scap; eu-sib
Populus nigra L. ; fo dec Mes P scap; paleotemp
Salix cinerea L. ; fo dec Mi P caesp; paleotemp
Salix elaeagnos Scop.; fo dec N P caesp; s.eu(orof)

fam: SANTALANACEAE

Thesium arvense Horv.; a Mi H caesp; evr -w.as

fam: SAPINDACEAE

Acer campestre L. (= *Acer campestre* f. *collinum* (DC.) Schwer.; *Acer campestre* f. *glabratum* (Wimm. & Grab.) Schwer.); fo dec Mi P caesp; eu-cauc (subpont)

Acer monspessulanum L. (= *Acer monspessulanum* var. *illyricum* (J.Jacq.) Steud.); fo dec Mi P caesp; eurimed

Acer opalus subsp. *obtusatum* (Waldst. & Kit. Ex Willd.) Gams (= *Acer obtusatum* Waldst. & Kit. Ex Willd.); fo dec Mi P caesp; se.eu

Acer pseudoplatanus L.; Fo dec Mes P scap; eu-cauc

fam: SAXIFRAGACEAE

Saxifraga bulbifera L.; v-a Mac H scap; s.i.medit

Saxifraga tridactylites L.; v N T scap; eurimed

fam: SCROPHYLARIACEAE

Scrophularia canina L.; a Mes-Meg H caesp; eurimed

Verbascum pulverulentum Vill.; a Meg-Alt H ros bienn; c.eu-s.eu

fam: SOLANACEAE

Datura stramonium L.; a-aut Meg-Alt T scap; , (Pančić, 1875)

Hyoscyamus niger L.; a Meg T scap; euras

Solanum nigrum L.; v-aut Mes-Meg T scap; cosm

fam: THYMELAEACEAE

Thymelaea passerina (L.) Coss. & Germ. (= *Ligia passerina* (L.) Fasano); a Mes T scap; eurimed-c.as

fam: TILIACEAE

Tilia platyphyllos Scop.; fo dec Mes P scap ; eu-cauc

Tilia tomentosa Moench; fo dec Mes P scap; se.eu-w.as

fam: ULMACEAE

Ulmus glabra Huds. (= *Ulmus scabra* Mill.); fo dec Mes P scap; eu-cauc

Ulmus minor Mill.; fo dec Mes P scap; eu-cauc

fam: URTICACEAE

Urtica dioica L. ; a Mes-Meg H scaP; cirkholark

fam: VALERIANACEAE

Valeriana officinalis L. (= *Valeriana officinalis* var. *angustifolia* Miq.); v-a Alt H scap; evr

Valeriana tuberosa L.; v Mes G tub scap; med (mo)

Valerianella locusta (L.) Laterr. (= *Valerianella locusta* (L.) Betsche); v-a Mes T scap; eurimed

Valerianella rimosa Bastard; v-a Mes T scap; eurimed

fam: VERBENACEAE

Verbena officinalis L. ; a-aut Mes-Mac H scap; paleotemp

fam: VIBURNACEAE

Sambucus ebulus L.; a Alt G rhiz caesp; eurimed (Pančić, 1875)

Sambucus nigra L.; fo dec Mi P caesp; eu-cauc

Viburnum lantana L.; fo dec N P caesp; s.eu

fam: VIOLACEAE

Viola arvensis Murray; v-a Mi-Mes T scap; euras

Viola canina L. ; v Mes H scap; euras

Viola kitaibeliana Schult.; v N-Mi T semiros; med-cauc

Viola odorata L.; v Mi-Mes H scap-rept; eurimed
Viola tricolor L. ; v-a Mi-Mes T scap; euras