ARTÍCULOS

Botanica Complutensis
ISSN-e: 1988-2874

http://dx.doi.org/10.5209/BOCM.56862

EDICIONES COMPLUTENSE

Approach to the floristic catalogue of the Dehesa of Somosierra and new records for the Community of Madrid (Spain)

Adrián Lázaro-Lobo, Borja Rodríguez de Francisco & Jesús Palá-Paúl[1]

Recibido: 1 marzo 2016 / Aceptado: 23 marzo 2017

Abstract. This study represents an approach to the floristic catalogue of the Dehesa of Somosierra, in the northeast corner of the Community of Madrid. The collection of plant material has been carried out along different expeditions from April 2013 to October 2015. A total of 192 species and subspecies were identified belonging to 135 genera and 47 families. It is also highlighted that two specimens of *Betula alba* included as two singular trees of the Community of Madrid have been identified as *Betula pendula* subsp. *fontqueri*. Besides, it is worth noting that the species *Myosotis debilis*, *Ornithogalum bourgaeanum*, and *Rubus vagabundus* are cited for the first time in the Community of Madrid.
Keywords: *Betula pendula* subsp. *fontqueri*; *Myosotis debilis*; *Ornithogalum bourgaeanum*; *Rubus vagabundus*.

[es] Aproximación al catálogo florístico de la Dehesa de Somosierra y nuevas citas para la Comunidad de Madrid (España)

Resumen. Herborizaciones periódicas desde abril del 2013 hasta octubre del 2015, han permitido elaborar el presente catálogo florístico de la Dehesa de Somosierra, localizada en el extremo noreste de la Comunidad de Madrid. Un total de 192 especies y subespecies han sido identificadas, pertenecientes a 135 géneros y 47 familias. Cabe destacar la determinación de dos especímenes de *Betula pendula* subsp. *fontqueri* previamente catalogados como *Betula alba* e inscritos como árboles singulares de la Comunidad de Madrid. Igualmente, hasta donde hemos podido averiguar, se presentan las primeras citas en la Comunidad de Madrid para las especies *Myosotis debilis*, *Ornithogalum bourgaeanum* y *Rubus vagabundus*.
Palabras clave: *Betula pendula* subsp. *fontqueri*; *Myosotis debilis*; *Ornithogalum bourgaeanum*; *Rubus vagabundus*.

Cómo citar: Lázaro-Lobo, A.; Rodríguez de Francisco, B.; Palá-Paúl, J. (2017). Approach to the floristic catalogue of the Dehesa of Somosierra and new records for the Community of Madrid (Spain). *Bot. complut.* 41: 29-38.

Introduction

The Community of Madrid has a wide variety of vegetation types, from natural to those caused by the anthropic effect. One of them, the Dehesa, is an essential component for ranching in Madrid and other regions. They have been historically used and have had a considerable area which is still present nowadays (López & Sáez 2002). One of the most popular Dehesas of the Community Madrid is The Dehesa of Somosierra, also called Dehesa Boyal of Somosierra or Dehesa Bonita of Somosierra placed in the northeast corner of the Community of Madrid. This vegetation type has been shaped by traditional forms of exploitation. This Dehesa is under a silvopastoral exploitation system where forestry and grazing of domesticated animals are combined. Men have left their footprint on the composition, appearance, structure and dynamics of this area leading to diverse landscapes of great natural and cultural value (woods, meadows, shrublands, etc.). As a result, a multifunctional Dehesa with various uses is obtained, such as forestry, livestock feed and hunting (López & Sáez 2002).

Otherwise, there are different studies conducted in this Dehesa or the surrounding areas. Most of them focus on the vascular flora (Bellot 1944, Cantó 2007, Cebolla Lozano & Rivas Ponce 1994, Mayor 1965) and land

[1] Departamento de Biología Vegetal I (Botánica), Facultad de Biología, Universidad Complutense de Madrid, E-28040 Madrid, Spain
E-mail: quibey@ucm.es

management (Díaz 1984, Ruiz de la Torre 1985, López & Sáez 2002, Gómez et al. 2009), but also about the fungi (Ruiz et al. 2013).

With respect to the physical characteristic of the area, soil consists of acid materials, with a metamorphic origin (gneisses and schists). Its origin is very old (Paleozoic) and correspond to rocks formed during the Hercynian orogeny, which were later covered by sediments and resurfaced over them during the subsequent Alpine Orogeny (Díaz Martínez et al. 2012, Durán 1998). The Dehesa of Somosierra lies in the temperate oceanic submediterranean bioclimate according to the Worldwide Bioclimatic Classification System (Rivas-Martinez & Rivas-Saenz 1996-2016, Rivas-Martínez et al. 2004). The climate is temperate and warm. The average annual temperature and precipitation are 8.6 ºC and 588 mm respectively. Rainfall is distributed throughout the year, ranging from 23 mm in August to 70 mm in May. Even in the driest month there is still a great rain water supply. Average monthly temperatures are less than 3 ºC in winter and above 15 ºC in summer (https://es.climate-data.org/location/469006/).

The vegetation of this area is the result of the climate and the orography of the zone, which can explain the presence of birch trees. The Central System behaves like a condensing moisture barrier, favoring cloud formation in this valley due to its topography and the constant presence of humid winds that are retained. The Dehesa of Somosierra has therefore an excellent location to catch both rainwater and fogs condensed in it, which allows the maintenance of constant and higher moisture conditions than in other surrounding areas and favors the presence of birch trees (García 2007).

The studied area is included in the Guadarrama sector and includes supratemperate and supramediterranean belts. *Betula celtiberica* forests and *Quercus pyrenaica* humid forests are the principal forests that can be found, although can also appear mountain pine forest in supratemperate and supramediterranean subhumid and humid belts (Cantó 2007). According to the vegetation series, previously described, the Dehesa of Somosierra corresponds to the *Melico uniflorae-Betulo celtibericae sigmetum* (Cantó 2007). However, throughout the Dehesa, diverse vegetation patches are found, each one characterize by the presence of one or more dominant species and its associated floristic complex (López & Sáez 2002).

Birch trees (*Betula* sp.) are concentrated on the south side of the valley where soils are permanently flooded, allowing the presence of poorly drained peatlands with abundant organic matter, but they are also distributed along the streams in shady sites. Paleobotanists data show that birches occupied larger areas of the Central System in the past (Holocene) than in the present, considering this birch grove the largest of the Community of Madrid, which acts as a relict glacier, increasing the identity and value of this Dehesa (López 1997). Surrounding the birch patch, soils are more aerated and do not have a permanent layer of water, allowing aerobic processes. In this area a mixed forest is developed, which contains rowan trees (*Sorbus aucuparia* L.), whitebeam (*Sorbus aria* (L.) Crantz), alder buckthorn (*Frangula alnus* Mill. subsp. *alnus*) and oak trees (*Quercus pyrenaica* Willd.). Besides, on these soils are present hazel trees (*Corylus avellana* L.) forming isolated groves. The outer area of the Dehesa is formed by a monospecific oak forest intensely intervened. As a result of this great modification, in some sectors are covered by scrubs such as *Adenocarpus hispanicus* (Lam.) DC. and *Genista florida* L. scrubs are present in much of the vegetation patches but some species are more abundant as *Adenocarpus hispanicus*, *Adenocarpus complicatus* (L.) J. Gay, *Genista florida*, *Cytisus oromediterraneus* Rivas Mart. et al. and *Cytisus scoparius* (L.) Link. subsp. *scoparius*. Pastures have little relevance and are present in small private enclaves that, in many cases, undergo an abandonment process that favors the expansion of scrubs.

The aim of this study is to contribute to the knowledge of the vegetation of the Dehesa of Somosierra with a detailed approach to its floristic catalogue.

Materials and Methods

The Dehesa of Somosierra is located in the northern sector of the Community of Madrid, between the mountain ranges of Guadarrama and Ayllón, in the UTM 30TVL5255. It is the number 122 of the Public Utility Mounts of the Province of Madrid catalog. It is part of the LIC-ES 3110002 Lozoya River Basin and Sierra Norte and it has an average altitude of 1450 m and an area of 98 ha. It is located on the southeast of Somosierra´s village, in the

northwest slope of Cebollera Nueva Mountain (1834 m) and it is drained by the Cambronales and Dehesa streams (Durán 1998, López & Sáez 2002).

The collection of plant material has been carried out along different expeditions from April 2013 to October 2015. A voucher specimen of all the specimens that were gathered during this period has been lodged at the Herbarium MACB. The voucher number of each one appears in Annex 1 where all genera are arranged in alphabetical order within families and all species are arranged in alphabetical order within genera. The method used was the presence of each taxa, but without considering or evaluating the abundance of them. Furthermore, in order to cover the largest number of specimens, expeditions were conducted at different seasons of the year, although most of them were carried out during the flowering period (April to June). All the vegetation patches were sampled trying to cover all the study area and collecting specimens of different species present in them.

All the species listed in Annex 1 were identified according to Flora Ibérica (Castroviejo 1986-2015), if there are several reprints, the date shown corresponds to the last one. When families were not published, other taxonomic bibliography were used: García Rollán (2006, 2009), López (2007) and González Bernáldez (1997).

Results and Discussion

The results of the floristic catalog conducted in the Dehesa of Somosierra are shown in Annex 1. A total of 331 vouchers were registered at the herbarium corresponding to 192 taxa, belonging to 135 genera and 47 families.

The most represented families, with more than seven species, are Caryophyllaceae, Compositae, Cruciferae, Gramineae, Labiatae, Leguminosae, Liliaceae, Ranunculaceae, Rosaceae and Scrophulariaceae. Otherwise, there are a lot of families with only one species in that area as Aquifoliaceae, Araliaceae, Cucurbitaceae, Cupressaceae, Ericaceae, Hypericaceae, Orobanchaceae, Oxalidaceae, Pinaceae, Plantaginaceae, Plumbaginaceae, Polygalaceae, Pyrolaceae, Rhamnaceae, Salicaceae, Saxifragaceae, Taxaceae, Urticaceae and Valerianaceae. As it has above explained only the presence of each species has been considered. That is the reason because families that include trees as Aquifoliaceae¸ Betulaceae or Fagaceae do not seem to be well represented although their occurrence and biomass, without doubt, should be higher than the rest.

We have compared our catalogue with those previously carried out in the area (López & Sáez 2002), with the exhaustive recompilation work about the vascular plant for the community of Madrid where 2233 species are mentioned (Morales 2003) and with the complete database of Anthos (http://www.anthos.es/). Four species, *Quercus robur* L., *Betula alba* L., *Polygonatum odoratum* (Mill.) Druce and *Vaccinium myrtillus* L., that have been previously cited in this area (López & Sáez 2002), could not be found during our prospection. On the other hand, most of our species have been previously cited in the Community of Madrid by Morales (2003) or in the Web http://www.anthos.es/ either with their actual accepted names or using any of their synonyms compiled on Flora Iberica or the plant list (http://www.theplantlist.org/). However, as far as we know, this is the first time that three species *Myosotis debilis*, *Ornithogalum bourgaeanum* and *Rubus vagabundus* are cited and gathered in the Community of Madrid. Besides, other species gathered by us, *Brassica repanda* subsp. *nudicaulis*, *Cardamine parviflora*, *Chaerophyllum temulum*, *Gagea foliosa* subsp. *ellyptica*, *Narcissus triandrus* subsp. *triandrus*, *Pilosella saussureoides*, *Polygala serpyllifolia* and *Ranunculus ficaria* subsp. *ficaria*, have been cited in the Community of Madrid although we could not find their voucher references.

It is worth noting that two specimens of *Betula alba* included as two singular trees of the Community of Madrid (BOCM 9 de abril de 1992, Decreto 18/1992) have been identified as *Betula pendula* subsp. *fontqueri*. Different samples were gathered and studied to be sure of the correct identification of this species (MACB 108489, MACB 108490). According to our results, the species of *Betula* present in the Dehesa of Somosierra is *Betula pendula* subsp. *fontqueri*. The first one is located about 80 m upstream of the Fountain of Fuentefría (41°07'27.1"N, 3°34'14.4"W). It consists of four main branches, is about 150 years old and has a height of about 17 m. The second one is located about 200 m from the Fountain of Fuentefría (41°07'26.6"N 3°34'21.9"W), following the path back to the right, where a grove of birch begins. It consists of three trunks emerg-

ing from the base, is about 200 years old and has a height of about 25 m.

The Dehesa of Somosierra can be considered a good example of both diversity conservation and anthropic exploitation. In fact, we can confirm the presence of two bioclimatic and phytogeographical indicators and endemisms of the Iberian Peninsula. *Adenocarpus hispanicus* is a low orotemperate element that can be considered a Guadarramean sector endemism and *Pinus sylvestris* (*Pinus sylvestris* var. *iberica* Svob.) a supratemperate and supramediterranean Iberian endemism (Cantó 2007). Besides, the flora found in this area is mainly characterized by species which present an Iberian Atlantic and Central European distribution, such as the trees *Betula pendula* subsp. *fontqueri*, *Ilex aquifolium*, *Sorbus aucuparia*, *Corylus avellana* and *Quercus petraea*. Some of them are very rare or have not been detected in the rest of the Central System and the Community of Madrid (Fig. 1), due to the abiotic factors mentioned above that take place in this area. These taxa coexist with others with more thermal Mediterranean requirements as oak trees (*Quercus pyrenaica*).

Some of the scrub species as *Rosa canina*, *Cytisus scoparius* subsp. *scoparius*, *Rubus ulmifolius* or *Crataegus monogyna* show a wide distribution along the Iberian Peninsula, they do not specifically appear in mesic areas. But there are exceptions as *Prunus spinosa*, *Rosa villosa, Adenocarpus hispanicus* and *Cytisus oromediterraneus* that only appear in mesic areas like this Dehesa.

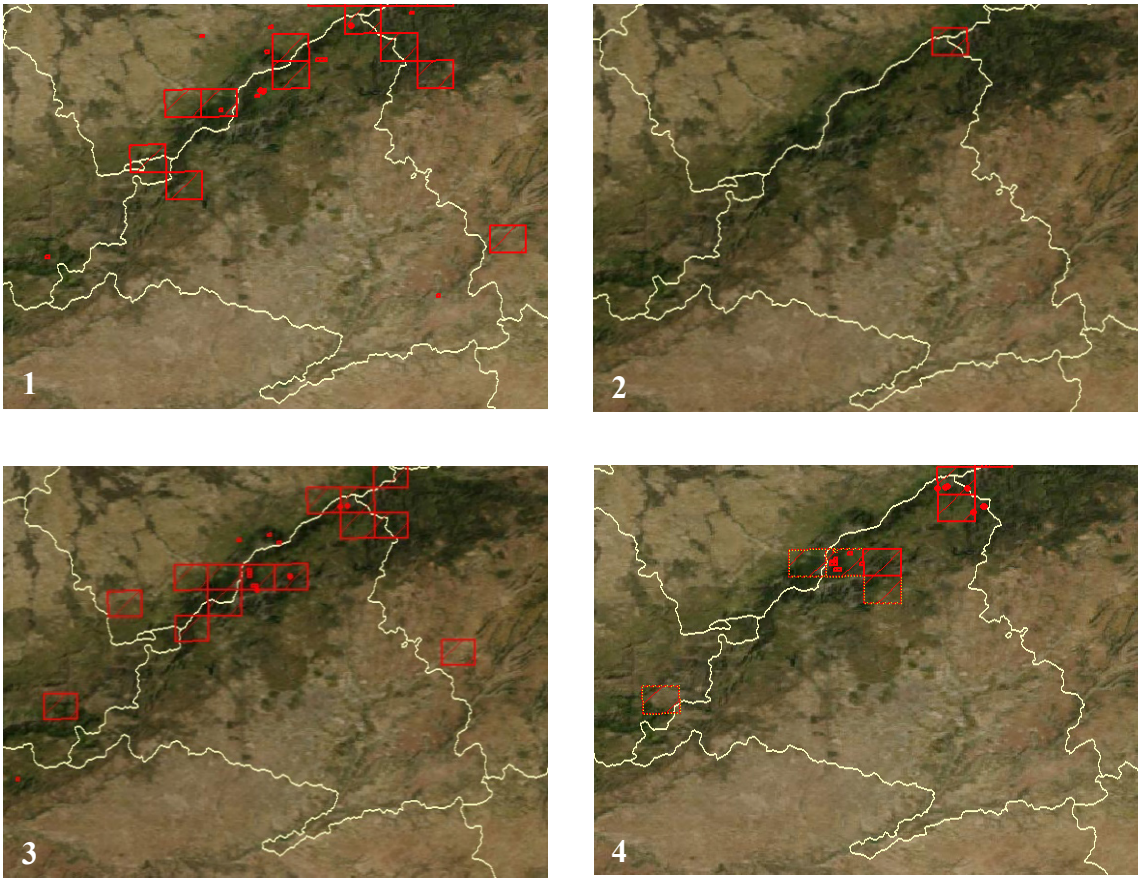

Figure 1. Distribution maps of *Corylus avellana* (1), *Betula pendula* subsp. *fontqueri* (2), *Ilex aquifolium* (3) and *Sorbus aucuparia* (4) in the Community of Madrid according to ANTHOS website.

Finally, there are also herbaceous species that have a little distribution or are not present in other parts of south-central Iberian Peninsula such as *Narcissus pseudonarcissus* subsp. *pseudonarcissus*, *Narcissus triandrus* subsp. *triandrus*, *Dianthus deltoides* subsp. *deltoides*, *Crepis lampsanoides*, *Ajuga reptans*, *Galeopsis ladanum* subsp. *ladanum*, *Prunella grandiflora*, *Lilium martagon*, *Polygala serpyllifolia*, *Lysimachia nemorum*, *Pyrola minor*, *Cruciata glabra* subsp. *hirticaulis*, *Melampyrum pratense* subsp. *latifolium*, *Veronica montana*, *Sanicula europea* y *Viola montcaunica* (the distribution of these species is based on data from Flora Ibérica (Castroviejo 1986-2015).

Conclusions

According to our results we can conclude that this approach to the floristic catalogue of the Dehesa of Somosierra consist of 331 vouchers corresponding to 192 taxa, belonging to 135 genera and 47 families. Two bioclimatic and phytogeographical indicators and endemisms of the Iberian Peninsula have been collected, *Adenocarpus hispanicus* as a low orotemperate Guadarramean sector endemism and *Pinus sylvestris* (*Pinus sylvestris* var. *iberica* Svob.) a supratemperate and supramediterranean Iberian endemism. Besides, it is the first time that the presence of the species *Myosotis debilis*, *Ornithogalum bourgaeanum*, and *Rubus vagabundus* is reported in the Community of Madrid. Finally two specimens of *Betula alba* included as two singular trees of the Community of Madrid have been identified as *Betula pendula* subsp. *fontqueri*.

Acknowledgments

We are very grateful to Carlos Aedo and Miguel Ángel Casado for their help. We would like also to thank the many friends who have accompanied us in the expeditions to collect plants during these years.

References

Anthos. Sistema de información sobre las plantas de España. http://www.anthos.es/.

Bellot, F. 1944. Estudios sobre la vegetación y flora de la comarca de Somosierra. An. Real Acad. Farmacia 2: 109-134.

BOCM 9 de abril de 1992. Decreto 18/1992, de 26 de marzo por el que se aprueba el Catálogo Regional de especies amenazadas de fauna y flora silvestres y se crea la categoría de árboles singulares.

Cantó, P. 2007. Vegetation series as a tool for biogeography: a case study of the central Iberian Peninsula. Phytocoenologia 37: 417-442.

Castroviejo, S. (coord. gen.) 1986-2015. Flora iberica 1-19, 20-21. Real Jardín Botánico, CSIC, Madrid.

Cebolla Lozano, C. & Rivas Ponce, M.A. 1994. Atlas florae matritensis (Amaryllidaceae, Iridaceae, Liliaceae, Orchidaceae). Fontqueria 41: 1-206.

Datos Climáticos Mundiales. Climate-data.org. http://es.climate-data.org/location/469006/.

Díaz, M.A. 1984. Criterios para el análisis de evolución de usos del suelo en zona de montaña: aplicación a un sector de Somosierra. Anales de Geografía de la Universidad Complutense 4: 131.

Díaz Martínez, E., López, F., Pérez González, A., Karampaglidis, T., Matas, J., Martín Parra, L.M. & Nozal, F. 2012. Geología de la Sierra Norte de Madrid: tan cerca y tan desconocida. Guía de Campo. Instituto Geológico y Minero de España.

Durán, J.J. 1998. Patrimonio geológico de la Comunidad Autónoma de Madrid. Sociedad Geológica de España y Asamblea de Madrid. Madrid.

García, J.J. 2007. 26 propuestas para el fin de semana. Rutas para andar por los espacios naturales de la Comunidad de Madrid. Consejería de Educación de la Comunidad de Madrid. Madrid. http://www.brunete.org/brunete/juventud/26%20propuestas%20para%20el%20fin%20de%20semana.pdf.

García Rollán, M. 2006. Atlas clasificatorio de la flora de España peninsular y balear. Volumen I. Mundi-Prensa Libros S.A.

García Rollán, M. 2009. Atlas clasificatorio de la flora de España peninsular y balear. Volumen II. Mundi-Prensa Libros S.A.

Gómez, J., Gómez, G., López, N., Madrazo, G. & Sáez, E. 2009. Aprovechamientos y dinámicas en los tallares de Rebollo de Somosierra-Ayllón. Cuadernos de la Sociedad Española de Ciencias Forestales 30: 247-254.

González Bernáldez, F. 1997. Gramíneas pratenses de Madrid. Madrid: Comunidad de Madrid, Conserjeria de Medio Ambiente y Desarollo Regional. Madrid.

López, P. (coor.) 1997. El Paisaje vegetal de la Comunidad de Madrid durante el Holoceno Final. Monografía Serie Arqueología, Paleontología y Etnografía, 5. Ed. Consejería de Educación y Cultura de la Comunidad Autónoma de Madrid. Madrid.

López, N. 2007. Las plantas vasculares de la Comunidad de Madrid. Catálogo florístico, claves dicotómicas y estudio detallado de la familia Compositae Giseke. Tesis doctoral, UCM.

López, N. & Sáez, E. 2002. Gestión, aprovechamiento y paisaje de las dehesas de Guadarrama y Somosierra. Ería 58: 231-245.

Mayor, M. 1965. Estudio de la flora y vegetación de las sierras de Pela, Ayllón y Somosierra. Tesis doctoral, UCM.

Morales, R. 2003. Catálogo de plantas vasculares de la Comunidad de Madrid (España). Bot. Complut. 27: 31-70.

Rivas-Martínez, S., Penas, A. & Díaz, T.E. 2004. Mapa bioclimático de Europa. Servicio Cartográfico de la Universidad de León, España.

Rivas-Martínez, S. & Rivas-Sáenz, S. 1999-2009. Sistema de clasificación bioclimática mundial. Centro de Investigaciones Fitosociológicas, España. http://www.ucm.es/info/cif.

Ruiz de la Torre, J. 1985. Las dehesas del vértice norte de Madrid. Montes 1: 8-14.

Ruiz, A., Iglesias, P., Rodríguez, B. & Muñoz, G. 2013. *Coprinopsis xenobia*, descripción y primeras localizaciones en España. Comparación filogenética con *Coprinopsis luteocephala*. Bol. Micol. FAMCAL 8: 63-69.

The plant list a working list of all plant species. http://www.theplantlist.org/ (accessed 1st Jannuary).

Annex 1. Family, species name and herbarium number of the catalogue. *Species not cited in Madrid by Morales (2003) or included in Anthos web site

Aquifoliaceae
Ilex aquifolium L.
MACB 108498, 108499.

Amaryllidaceae
Narcissus bulbocodium L.
MACB 108496, 108497.
Narcissus pseudonarcissus L. subsp. *pseudonarcissus*
MACB 108495.
Narcissus rupicola Dufour ex Schult. & Schult. fil.
MACB 108493, 108494.
Narcissus triandrus L. subsp. *triandrus* MACB 108492.

Araliaceae
Hedera helix subsp. *helix* L.
MACB 108491.

Betulaceae
Betula pendula subsp. *fontqueri* (Rothm.) G. Moreno & Peinado
MACB 108489, 108490.
Corylus avellana L.
MACB 108487, 108488.

Boraginaceae
Myosotis arvensis (L.) Hill subsp. *arvensis*
MACB 108485, 108486.
Myosotis debilis Pomel*
MACB 108484.
Pentaglottis sempervirens (L.) Tausch
MACB 108482, 108483.

Campanulaceae
Campanula lusitanica L. subsp. *lusitanica*
MACB 108559, 108560.
Jasione montana L.
MACB 108500, 108501, 108502.
Wahlenbergia hederacea (L.) Rchb. MACB 108503.

Caprifoliaceae
Lonicera periclymenum subsp. *hispanica* (Boiss. & Reut.) Nyman. MACB 108504.
Sambucus ebulus L.
MACB 108505, 108506.

Caryophyllaceae
Arenaria grandiflora L. subsp. *grandiflora*
MACB 108507, 108508.
Cerastium ramosissimum Boiss.
MACB 108509, 108510.
Dianthus deltoides L. subsp. *deltoides*
MACB 108511.
Dianthus lusitanus Brot.
MACB 108512, 108513.
Moehringia pentandra J. Gay
MACB 108514.

Silene latifolia Poir.
MACB 108515, 108516.
Silene saxifraga L.
MACB 108517, 108518.
Silene vulgaris (Moench) Garcke subsp. *vulgaris*
MACB 108519, 108520.
Spergularia capillacea (Kindb.) Willk. MACB 108521, 108522.
Stellaria neglecta Weihe
MACB 108523, 108524, 108525.

Compositae
Achillea millefolium L. subsp. *millefolium*
MACB 108526, 108527.
Arnoseris minima (L.) Schweigg. & Körte
MACB 108528, 108529.
Bellis perennis L.
MACB 108530, 108531.
Carduus carpetanus Boiss. & Reut. subsp. *carpetanus*
MACB 108532, 108533.
Centaurea cyanus L. MACB 108534.
Centaurea triumfetti All.
MACB 108535, 108536.
Crepis capillaris (L.) Wallr.
MACB 108537.
Crepis lampsanoides (Gouan) Tausch MACB 108538.
Crepis vesicaria subsp. *taraxacifolia* (Thuill.) Thell.
MACB 108539.
Doronicum plantagineum L.
MACB 108540.
Hypochaeris radicata L.
MACB 108541.
Lapsana communis L. subsp. *communis*
MACB 108542, 108543.
Leucanthemopsis pallida (Mill.) Heywood subsp. *pallida*
MACB 108544, 108545.
Mycelis muralis (L.) Dumort.
MACB 108546, 108547.
Pilosella castellana (Boiss. & Reut.) F.W. Schultz & Sch. Bip.
MACB 108548.
Pilosella saussureoides Arv.-Touv.
MACB 108549
Senecio adonidifolius Loisel.
MACB 108550, 108551.
Senecio jacobaea L.
MACB 108552, 108553.
Senecio vulgaris L.
MACB 108554, 108555.
Taraxacum officinale G. H. Weber ex Wigg.
MACB 108556.

Crassulaceae
Sedum acre L.
MACB 108558, 108559.
Sedum hirsutum All. subsp. *hirsutum* MACB 108560.
Sedum pedicellatum Boiss. & Reut. MACB 108561, 108562.
Umbilicus rupestris (Salisb.) Dandy MACB 108563, 108564.

Cruciferae
Alliaria petiolata (G. Kirchn.) Bean. MACB 108565, 108566, 108567.
Brassica repanda subsp. *nudicaulis* (Lag.) Heywood
MACB 108568, 108569.
Capsella bursa-pastoris (L.) Medik.
MACB 108570.
Cardamine flexuosa With.
MACB 108571.
Cardamine parviflora L.
MACB 108572.
Cardamine pratensis L. subsp. *pratensis*
MACB 108573, 108574.
Erophila verna (L.) Chevall.
MACB 108575.
Teesdalia nudicaulis (L.) R. Br.
MACB 108576, 108577.
Thlaspi perfoliatum L.
MACB 108578, 108579.

Cucurbitaceae
Bryonia dioica Jacq.
MACB 108580, 108581.

Cupressaceae
Juniperus communis L. subsp. *communis*
MACB 108582, 108583.

Cyperaceae
Carex muricata subsp. *pairae* Host
MACB 108584.
Carex nigra (L.) Reichard
MACB 108585, 108586.

Ericaceae
Erica arborea L.
MACB 108587.

Fagaceae
Quercus petraea subsp. *huguetiana* Franco & G. López
MACB 108588, 108589.
Quercus pyrenaica Willd.
MACB 108591, 108592, 108593.

Geraniaceae
Erodium cicutarium (L.) L´Hér.
MACB 108594.
Geranium columbinum L.
MACB 108595, 108596.
Geranium lucidum L.
MACB 108597.
Geranium pyrenaicum subsp. *lusitanicum* L.
MACB 108598, 108599, 108600.
Geranium robertianum Stephan ex Willd.
MACB 108601, 108602.

Gramineae
Anthoxanthum odoratum L.
MACB 108603, 108604.
Bromus hordeaceus L.
MACB 108605, 108606.
Bromus sterilis L.
MACB 108607, 108608.
Cynosurus echinatus L.
MACB 108609, 108610.
Cynosurus elegans Desf.
MACB 108611.
Dactylis glomerata L. subsp. *glomerata*
MACB 108612.
Festuca paniculata (L.) Schinz & Thell.
MACB 108613, 108614.
Festuca rivularis Boiss. subsp. *rivularis*
MACB 108615.
Milium vernale M. Bieb.
MACB 108616, 108617.
Phleum pratense L.
MACB 108618, 108619.
Piptatherum miliaceum (L.) Coss.
MACB 108620.
Poa annua L.
MACB 108621.
Poa bulbosa L.
MACB 108622, 108623.
Poa nemoralis L.
MACB 108624, 108625.
Poa pratensis L.
MACB 108626, 108627.
Trisetum ovatum (Cav.) Pers.
MACB 108628.

Hypericaceae
Hypericum perforatum L. subsp. *perforatum*
MACB 108629.

Iridaceae
Crocus carpetanus Boiss. & Reut.
MACB 108630, 108631.
Crocus serotinus Salisb.
MACB 108632.
Xiphion vulgare Mill.
MACB 108633, 108634.

Juncaceae
Juncus effusus L.
MACB 108635, 108636.
Luzula campestris (L.) DC.
MACB 108637.
Luzula forsteri (Sm.) Lam. & DC. subsp. *forsteri*
MACB 108638, 108639.
Luzula lactea (Link) E. Mey.
MACB 108640, 108641.

Labiatae
Acinos alpinus (L.) Moench
MACB 108642, 108643.
Ajuga reptans L.
MACB 108644, 108645.
Ballota nigra L.
MACB 108646, 108647.
Clinopodium vulgare L.
MACB 108648
Galeopsis ladanum L. subsp. *ladanum*
MACB 108649, 108650.
Lamium purpureum L.
MACB 108651, 108652.
Prunella grandiflora (L.) Scholler
MACB 108653, 108654.
Prunella vulgaris L.
MACB 108655, 108656.
Teucrium scorodonia L.
MACB 108657, 108658.

Leguminosae
Adenocarpus complicatus (L.) J. Gay
MACB 108346.
Adenocarpus hispanicus (Lam.) DC.
MACB 108347.
Cytisus oromediterraneus Rivas Mart. & al.
MACB 108348.
Cytisus scoparius (L.) Link subsp. *scoparius*
MACB 108349.
Genista florida L.
MACB 108350.
Lathyrus linifolius (Reichard) Bässler
MACB 108351.
Lathyrus niger (L.) Bernh.
MACB 108352.
Lotus corniculatus subsp. *delortii* (Timb.-Lagr.) O. Bolòs & Vigo
MACB 108353.
Medicago lupulina L.
MACB 108354.

Ornithopus perpusillus L.
MACB 108355.
Trifolium pratense L. subsp. *pratense*
MACB 108356.
Trifolium repens L.
MACB 108357.

Liliaceae
Allium sphaerocephalon L.
MACB 108358.
Asphodelus albus Mill. subsp. *albus*
MACB 108359, 108360.
Gagea foliosa subsp. *ellyptica* A. Terracc.
MACB 108361.
Hyacinthoides hispanica (Mill.) Rothm.
MACB 108362.
Lilium martagon L.
MACB 108363, 108364, 108365, 108366.
Merendera montana (Loefl. ex L.) Lange
MACB 108367.
Ornithogalum bourgaeanum Jord. & Fourr.*
MACB 108368, 108371.
Ornithogalum narbonense L.
MACB 108372.

Orchidaceae
Dactylorhiza sambucina (L.) Soó
MACB 108373.
Orchis langei K. Richt.
MACB 108374.

Orobanchaceae
Orobanche alba Stephan ex Willd.
MACB 108375, 108376.

Oxalidaceae
Oxalis acetosella L.
MACB 108377, 108378.

Papaveraceae
Corydalis intermedia (L.) Mérat
MACB 108379, 108380, 108381.
Papaver dubium L.
MACB 108382, 108383.

Pinaceae
Pinus sylvestris L.
MACB 108384, 108385.

Plantaginaceae
Plantago lanceolata L.
MACB 108386.

Plumbaginaceae
Armeria arenaria subsp. *segoviensis* (Gand. ex Bernis) Nieto Fel.
MACB 108387.

Polygalaceae
Polygala serpyllifolia Hosé
MACB 108388, 108389.

Polygonaceae
Polygonum lapathifolium L.
MACB 108390
Rumex acetosella subsp. *angiocarpus* (Murb.) Murb.
MACB 108391, 108392.

Primulaceae
Lysimachia nemorum L.
MACB 108393.
Primula veris subsp. *columnae* (Ten.) Maire & Petitmengin
MACB 108394, 108395.

Pyrolaceae
Pyrola minor L.
MACB 108396.

Ranunculaceae
Aconitum vulparia subsp. *neapolitanum* (Ten.) Muñoz Garm.
MACB 108397, 108398, 108399.
Aquilegia vulgaris L. subsp. *vulgaris*
MACB 108400.
Hepatica nobilis Schreb.
MACB 108401, 108402.
Ranunculus ficaria L. subsp. *ficaria*
MACB 108403.
Ranunculus flammula L.
MACB 108404.
Ranunculus ollissiponensis subsp. *alpinus* (Boiss. & Reuter) Grau
MACB 108405, 108406.
Ranunculus ollissiponensis Pers. subsp. *ollissiponensis*
MACB 108407, 108408.

Rhamnaceae
Frangula alnus Mill. subsp. *alnus*
MACB 108411, 108412.

Rosaceae
Crataegus monogyna Jacq.
MACB 108417, 108418.
Geum hispidum Fr.
MACB 108419, 108420, 108421.
Malus sylvestris (L.) Mill.
MACB 108422, 108423.
Potentilla erecta (L.) Raeusch.
MACB 108424.

Prunus avium L.
MACB 108425, 108426.
Prunus spinosa L.
MACB 108427.
Rosa canina L.
MACB 108428, 108429.
Rosa villosa L.
MACB 108430, 108431.
Rubus ulmifolius Schott
MACB 108432.
Rubus vagabundus Samp.*
MACB 108433.
Sorbus aria (L.) Crantz
MACB 108434, 108435, 108436.
Sorbus aucuparia L.
MACB 108437, 108438.

Rubiaceae
Cruciata glabra subsp. *hirticaulis* (Beck) Natali & Jeanm.
MACB 108413, 108414.
Cruciata laevipes Opiz
MACB 108415.
Galium aparine L. subsp. *aparine*
MACB 108416.

Salicaceae
Salix atrocinerea Brot.
MACB 108439, 108440, 108441.

Saxifragaceae
Saxifraga granulata L.
MACB 108442, 108443.

Scrophulariaceae
Digitalis purpurea L. subsp. *purpurea*
MACB 108444, 108445.
Linaria elegans Cav.
MACB 108446, 108447.
Linaria nivea Boiss. & Reut.
MACB 108448, 108449.
Melampyrum pratense subsp. *latifolium* Schübl. & G. Martens
MACB 108450, 108451.
Parentucellia latifolia (L.) Caruel
MACB 108452.
Pedicularis sylvatica L. subsp. *sylvatica*
MACB 108453.
Verbascum pulverulentum Vill.
MACB 108454.
Veronica chamaedrys L. subsp. *chamaedrys*
MACB 108455, 108456.
Veronica hederifolia L.
MACB 108457, 108458.
Veronica montana L.
MACB 108459.
Veronica officinalis L.
MACB 108460.
Veronica polita Fr.
MACB 108462.
Veronica serpyllifolia L. subsp. *serpyllifolia*
MACB 108463.
Veronica verna L.
MACB 108464.

Taxaceae
Taxus baccata L.
MACB 108465

Umbelliferae
Anthriscus sylvestris (L.) Hoffm.
MACB 108466.
Chaerophyllum hirsutum L.
MACB 108467
Chaerophyllum temulum L.
MACB 108468, 108469, 108470.
Conopodium pyrenaeum (Loisel.) Miégev.
MACB 108471, 108472.
Sanicula europaea L.
MACB 108473, 108474.

Urticaceae
Urtica dioica L.
MACB 108475, 108476.

Valerianaceae
Valerianella locusta (L.) Laterr. subsp. *locusta*
MACB 108477.

Violaceae
Viola kitaibeliana Schult.
MACB 108478.
Viola montcaunica Pau
MACB 108479.
Viola odorata L.
MACB 108480, 108481.