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# The Floristic and Vegetation Study of an Area of Interest in Valencia (Spain) Proposed as Plant Micro-Reserve

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**Abstract**

Plant micro-reserves (PMRs) represent a new tool for conservation, which were developed in the last decade in Spain. They are small land plots that shelter populations of endemic, rare and threatened taxa. The originality of PMRs is that they not only provide protection for plants of special interest but are also a tool for scientific studies and management actions, such as ecological restoration, reinforcement or creation of new populations. The first PMRs were declared in 1998 in Valencia (SE Spain), and today there are 259 in this region alone, as well as many others in different parts of Spain and other countries. The aim of the present study was to thoroughly analyse the floristic composition and to identify the plant communities present in an area that we considered of special interest and worth to be declared as a new PMR in Valencia. The site was selected for its special floristic interest, and for its status of preservation of the natural habitat, which is rather high in this area, near the coast, where most natural spaces have been severely modified by the anthropic effect. The floristic inventory consists of 199 vascular plants. Four taxa are endemics restricted to the Valencian territory (*Biscutella* gr**.** *calduchii*, *Sideritis juryi*, *Teucrium edetanum* and *Urginea undulata* subsp. *caeculi*), two are narrow nearly exclusively endemics (*Helianthemum origanifolium* subsp. *glabratum* and *Thymus vulgaris* subsp. *aestivus*) and seven are eastern Iberian endemics of wider distribution. The potential natural vegetation, corresponding to scrublands of the community *Querco cocciferae-Pistacietum lentisci*, is underrepresented due to the extension of perennial (ass. *Heteropogono contortii-Stipetum tenacissimae* and *Teucrio pseudochamaepitys-Brachypodietum retusi*) and therophytic pastures (*Saxifrago tridactylitae-Hornungietum petraeae*). In addition, three plant communities of anthropic origin were recorded (*Medicagini littoralis-Stipetum capensis*, *Crassulo tillaeae-Saginetum apetalae* and *Plantagini albicans-Stipetum parviflorae*).

***Keywords:*** plant micro-reserve, endemic flora, Valencian endemics, Iberian endemics, floristic catalogue, vegetation

## Introduction

The Valencian Community (SE Spain) is a territory of great diversity. Its different orography and geology, associated with climate variations, from the warm Thermomediterranean to the cold Oromediterranean thermotype, generated numerous distinct habitats which shelter a very diverse flora (Crespo, 2000). More than three thousand vascular plant taxa (up to subspecies level) are present in this territory (Mateo and Crespo, 2003). This represents more than sixty percent of the approximately five thousand species of peninsular Spain (Laguna et al., 1998). The high diversity is translated not only in an elevated number of species, but also in a high rate of endemics. There are 60 endemic plant species exclusive of the Valencian territory, 71 restricted to this territory and neighbouring areas, and 220 Iberian endemics (Laguna et al., 1998). On the other hand, the Valencian Community is a very populated area of Spain, with an enormous human pressure on the environment. Many of the natural habitats have been transformed for agricultural purposes, industrialization, urban development, or are affected by tourist impact (Rosselló, 1995). For this reason, the Regional Wildlife Service of Generalitat Valenciana, the autonomous government of the Valencian region, created the first plant micro-reserves in 1998, in the frame of several successive Life projects, financed by the European Commission.

The plant micro-reserves (PMRs) are small land plots up to 20 ha, with a special value in terms of plant richness, endemicity or rarity. Their legal frame confers a permanent status and provides strong protection to plants and their substrate, while allowing traditional activities compatible with plant conservation and the establishment of new strategies of sustainable land use, such as ecotourism. PMRs were created to ensure an inventory of sites of great floristic diversity and to monitory target species (endemic and rare or threatened) and vegetation types (Laguna, 2001). They also facilitate management actions, such as ecological restoration, reinforcement or creation of new populations. According to Laguna (2007) they represent observatories on changes in the floristic composition that use endemic, rare or threatened plants as bio-indicators.

Currently, there are 259 plant micro-reserves in the region of Valencia, covering together 1800 ha. In these areas

there are protected populations of 1505 species of vascular plants, 270 of them Spanish endemics, representing 70% of the total contingent of Valencian endemics (Laguna et al., 2007).

Potential candidates to be declared as PMRs are areas that shelter taxa of special interest, endemics, rare or threatened, and that preserve at least partially their natural habitat. The proposal for a PMR may be carried out directly by the Regional Wildlife Service of Generalitat Valenciana, by research institutes and city councils, or by individuals, always based on a detailed study of the existent flora and plant communities. The land may be state or privately owned. In so far, there are forty private PMRs in this region; their landowners do not receive periodical subsidies, but up to 80% of conservation cost may be financed by the local government.

The present study was carried out for the proposal of a new PMR at Plá de Colom, Bétera (Province of Valencia). This rather small surface, of 1.7 ha, contains several taxa of great interest, some of them exclusive Valencian endemic, others nearly exclusive (eastern Iberian endemics of narrow distribution), or widely distributed Iberian endemics. The natural habitat of Plá de Colom is not much altered, but is very strongly threatened by urban pressure, that is continuously increasing in the areas close to the coast. The land belongs to the "Junta de Montes de Bétera", an association of private owners, who showed much interest in the conservation of this site, as it is the last one that remains unaltered in the area.

**Materials and methods**

The floristic inventory was carried by periodical visits to the area, mostly in the spring of 2007. Taxonomical identification was carried out with identification keys (Mateo and Crespo, 2003; Bolòs and Vigo, 2005) on fresh material and herbarium specimens collected in the field. Nomenclature used, biotype and chorology follows Mateo and Crespo (2003). Allochtonous species and their degree of invasion (number of specimens) were included in the catalogue (invasive xenophytes are eliminated after an area is declared as micro-reserve) as recommended by Sanz-Elorza et al., 2004. The abundance of species in the studied site and neighbouring areas was also considered.

For the study of the plant communities present, phytosociological relevés were performed by the classical sigmatist method of Braun-Blanquet (1979). Phytosociological nomenclature and classification follows AEFA (Asociación Española de Fitosociología) and FIP (Federation Internationale de Phytosociologie) as indicated by Rivas Martínez et al., (2000, 2001).

Populations of strictly endemic taxa were censed and the exact location of each individual was determined by GPS and transferred to a 1: 50,000 topographic map digitized into a geographic information system (Arc View GIS v.3.2 for Windows).

**Results and discussion**

*Floristic inventory*

A number of 199 vascular plants were identified, with a clear dominance of angiosperms (99%). Only two gymnosperms exist here, *Pinus halepensis* and *Juniperus oxycedrus*, and pterydophytes are completely absent.

Among the angiosperms, dicotyledonous plants are dominant, with composites in the first place, followed by the legumes. Grasses are dominant among the monocotyledonous.

The great majority of the taxa identified are Mediterranean (Figure 1), mostly circum Mediterranean, central and western Mediterranean and Mediterranean-Iranoturanian. Iberolevantine species are also significant (Figure 2), since the studied area is located in the last foothills of the Iberian Mountain System. The remaining elements have a low representation and are mostly Eurasian or subcosmopolitan (Mateo and Crespo, 2003). The tropical, subtropical and North American elements appear in the area only as result of anthropozoogenic activities (Figure 1).

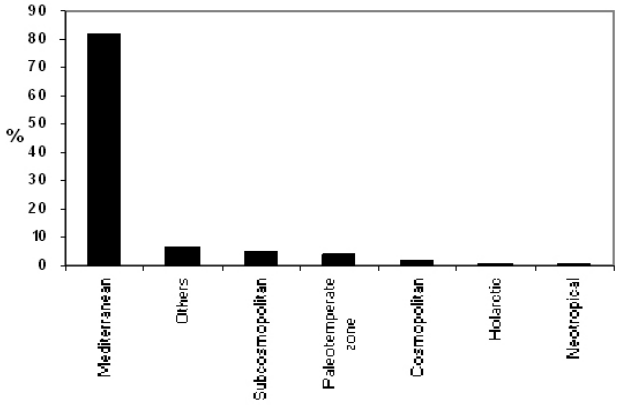


Figure 1 Biogeographic classification of taxa present in the area

Regarding the life forms, the majority of plants present are therophytes (46%), followed by chamaephytes (20%) and hemicryptophytes (17%). The dominance of annual plants is explained by the presence of therophytic pastures

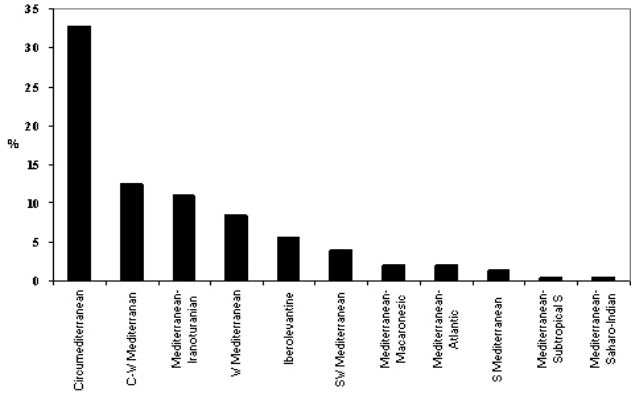


Figure 2 Types of Mediterranen elements

that co-exist with other communities dominated by hemicryptophytes. The chamaephytes are found mainly in the communities of *Rosmarinetea officinalis*. The phanerophytes are few (7% nanophanerophytes, 2% mesophanerophytes and 2% macrophanerophyte). The most common are *Quercus coccifera* and *Pistacia lentiscus*, and the only tree species present is *Pinus halepensis*, but phanerophytes are underrepresented in the area, due to competition with *Stipa tenacissima*, which was traditionally cultivated.

The area has a special interest due to the presence of several endemic and/or threatened taxa, which is the reason for proposing it as a Plant micro-reserve. According to Laguna et al., (1998) these endemics are classified into the following categories: four are exclusively restricted to the Valencia community, two are nearly exclusive endemics, but present also in few neighbouring regions, and seven are eastern Iberian endemics of wider distribution.

*Exclusive endemic taxa*

*Sideritis juryi* Peris, Stübing & Figuerola. Woody labiates, that grows in dry and sunny scrublands of the thermomediterranean thermotype with dry-semiarid ombrotype. It has a limited distribution in Valencia Province, but its populations are well structured and represented by numerous individuals, so it is classified as LC (least concern), according to the IUCN category of threatened species.

*Teucrium edetanum* M.B. Crespo et al. It is a suffruticose shrub of the Labiatae family, present in sunny bushes in the dry, semi-arid thermomediterranean climatic conditions. It has a very limited distribution on the left side of the river Turia, an area subjected to a very strong urban and agricultural impact which is classified within NT (near threatened) by the IUCN categories.

*Urginea undulata* (Desf.) Steinh. subsp. *caeculi* (Pau) M.B. Crespo and G. Mateo. Bulbous geophyte with optimum in diverse hemicryptophytic pastures with dry-subhumid ombrotype and thermomediterranean thermotype. Its populations area located in the littoral areas of the provinces of Valencia and Alicante and received the IUCN category of NT.

*Biscutella* gr**.** *calduchii*. Perennial of the cruciferous family, endemic in open scrublands at low altitudes of the Setabense sector in Valencia. It belongs to a group that was recently split in several taxa.

*Nearly exclusive endemics*

*Helianthemum origanifolium* (Lam.) Pers. subsp. *glabratum* (Willk) Guinea and Heywood. Perennial plant, with woody base, characteristic of dry and sunny scrublands in Valencia, Castellón and Teruel. Under UICN criteria is considered as LR (lower risk).

*Thymus vulgaris* L. subsp. *aestivus* (Reut. ex Willk.) A. Bolòs and O. Bolòs. Perennial labiates, of generally degraded bushes. Iberolevantine and Balearic endemic, with its main distribution in Valencia, but with a few populations in Murcia and Ibiza as well.

The following taxa belong to the group of Iberian Endemics of wider distribution: *Anthyllis terniflora* (Lag.) Pau, *Centaurea aspera* L. subsp. *stenophyll*a (Dufour) Nyman, *Centaurium quadrifolium* (L.) G. López and Jarvis subsp. *barrelieri* (Dufour) G. López, *Coris monspeliensis* L. subsp. *fontqueri* Mascl., *Dianthus broteri* Boiss. and Reut. subsp. *valentinus* (Willk.) Rivas Mart. et al., *Guillonea scabra* (Cav.) Coss., *Paronychia suffruticosa* (L.) DC. subsp. *suffruticosa*.

*Vegetation study*

Seven plant communities were identified, five of which belong to the Setabensic Thermomediterranean series of *Pistacia lentiscus* and are affected only partially by traditional human activities developed in the area. The other threecommunities are clearly results of anthropization.

*Evergreen sclerophyllous maquis: Querco cocciferae-Pistacietum lentisci*

It is a community of closed maquis, of elevated coverage, with a medium height of 1-2 m. In optimal conditions of development it is practically impenetrable. In the studied area is represented by several patches surrounded by communities with *Stipa tenacissima*. The dominant plant species are mesophanerophytes shrubs, such as *Quercus coccifera* and *Pistacea lentiscus*, accompanied by halep pine (*Pinus halepensis*) and nanophanerophytes *(Asparagus horridus, Rhamnus oleoides* subsp. *angustifolia*, *Juniperus oxycedrus* subsp. *Oxycedrus*, e.a.). All these taxa are characteristic for the order *Pistacio lentisci-Rhamnetalia alaterni*. The herbaceous vegetation layer is occupied mainly by *Brachypodium retusum*, and in smaller number also by *Brachypodium phoenicoides* and *Avenula bromoides.* The lianoid layer is clearly dominated by *Rubia peregrina* subsp. *longifolia*, characteristic phaneropyhte of the class *Quercetea ilicis*. Even though this association appears usually as a substitution stage of holm oak (*Quercus ilex*) formations, in the studied area, where the amount of rainfall is too low for the establishment of a forest structure, it represents the potential vegetation.

*Serial calcophilous matorral: Helianthemo mollis-Ulicetum parviflori*

This plant community shapes bushes with less than 1 m height and of variable coverage. In the studied area the coverage is low due to its replacement by cultivation of *Stipa tenacissima*. It includes mostly nanophanerophytes and thermophilous chamephytes, such as *Sideritis tragoriganum*, *Polygala rupestris*, *Thymus vulgaris* subsp. *aestivus*, all characteristic of the alliance *Rosmarino-Ericion multiflorae*. *Coronilla minima* subsp. *lotoides*, *Rosmarinus officinalis*, *Fumana thymifolia*, *Cistus clusii*, *Helianthemum syriacum*, *Dorycnium pentaphyllum* subsp. *pentaphyllum*, *Coris monspeliensis* subsp. *fontqueri*, *Teucrium capitatum* subsp. *capitatum* and *Thymelaea hirsute* are characteristic of the order *Rosmarinetalia officinalis* and class *Rosmarinetea*

*officinalis*. It is interesting the presence among companions of *Anthyllis terniflora*, a nanophanerophyte endemic of SE Iberian Peninsula. This community develops on degraded and less developed soils of basic substrate, in the littoral areas, within dry or semiarid thermo- and mesomediterranen thermotypes. It represents a succession stage, usually in the replacement of the holm ilex forests, or in this case, of the evergreen sclerophyllous maquis.

*Dry perennial pastures: Heteropogono contorti-Stipetum tenacissimae*

This community of high grasses is dominated by *Stipa tenacissima*, accompanied by other hemicryptophytes and geophytes, such as: *Avenula bromoides*, *Brachypodium retusum*, *Convolvulus althaeoides*, *Dipcadi serotinum* and *Asphodelus ramosus*. It belongs to the dry and semi-arid series, especially of *Querco cocciferae – Pistacieto lentisci sigmetum* and contacts with scrubland communities of the class *Rosmarinetea officinalis*, and therefore includes a high number of chamaephytes and nanophanerophytes of this class (e.g., *Argyrolobium zanonii*, *Teucrium capitatum* subsp. *capitatum*, *Guillonea scabra*, *Thymus vulgaris* subsp. *vulgaris*, *Sideritis tragoriganum* subsp. *tragoriganum*, *Thymelaea hirsuta*, *Helianthemum syriacum*, *Fumana thymifolia*). This plant community, just on the contrary that the previous one, was favoured by human activities, since the feather grass (*Stipa tenacissima*) was cultivated for a long period of time. Nowadays this type of cultivation ceased and probably the community will be gradually replaced by bushes formation of *Rosmarinetea officinalis*.

*Teucrio pseudochamaepityos-Brachypodietum*

This community is dominated by the grass *Brachypodium retusum,* accompanied by hemicryptophytes characteristic of the class *Lygeo-Stipetea* and order *Lygeo-Stipetalia***,** such as *Convolvulus althaeoides*, *Avenula bromoides* and *Stipa offneri*. It is developed here under a canopy of *Pinus halepensis* and represents a stage of advanced degradation of the vegetation series of *Querco cocciferae – Pistacieto lentisci sigmetum*, which substitutes the association *Heteropogono contorti-Stipetum tenacissimae*. Scrubland taxa of *Rosmarinetea officinalis* and maquis of *Quercetea ilicis* are frequent as companions.

*Therophytic pastures: Saxifrago tridactylitae-Hornungietum petraeae*

This community of nanoterophytes of small size covers poor, superficial, carbonate soils, with clayey or slimy texture. The characteristic species are: *Hippocrepis ciliata*, *Asterolinon linum-stellatum*, *Silene colorata* and *Helianthemum salicifolium* subsp. *salicifolium*, corresponding to the class *Tuberarietea guttatae*; *Euphorbia falcata* and *Euphorbia exigua*, corresponding to the order *Brachypodietalia distachy*. In the studied area it appears in the clearing of the "espartal" *Heteropogono contorti-Stipetum tenacissimae* and represents the most advanced stage of degradation of the vegetation series *Querco cocciferae – Pistacieto lentisci sigmetum*. It is interesting the presence of several species that normally appear in pioneer siliceous communities, such as *Tuberaria guttata*, *Tolpis umbellata* and *Hypochoeris glabra*, characteristic of the order *Tuberarietalia guttatae* and the alliance *Tuberarion guttata*.

*Anthropogenic communities: Crassulo tillaeae-Saginetum apetalae*

It is a pioneer community consisting mainly of annual species, subjected to a constant human pressure mainly by trampling. The most interesting taxa found are *Crassula tillaea* and *Sagina apetala*, accompanied by others of *Tuberarietea*. It is important here the presence of mosses, which cover almost completely the surface.

*Medicagini littoralis-Stipetum capensis*

It is xerophytic subnitrophilous grassland, dominated by *Stipa capensis* and other species, such as *Rostraria cristata*, *Medicago littoralis*, *Bromus madritensis*, *Filago pyramidata, Lolium rigidum, Calendula arvensis* and *Urospermum picroides*. This community develops as a result of overgrazing of pastures of the class *Tuberarietea* guttatae, which changes to subnitrophilous grasslands typical of the order *Brometalia*, due to the accumulation of nitrophilous and subnitrophilous taxa. We found this community at the border of the road in the studied area, but it is quite frequent in degraded areas of the Valencian territory.

*Plantagini albicantis-Stipetum parviflorae*

It is another subnitrophilous community dominated by *Stipa parviflora*, together with *Plantago albicans*, *Asphodelus fistulosus* and *Convolvulus althaeoides*. Other species characteristic for the order and class are *Brachypodium retusum* and *Stipa offneri* (*Lygeo-Stipetea* and *Lygeo-Stipetalia*). This is a type of pioneer community, colonising naked substrates, and which favours the entry of other communities. In the studied area, it is localised in an abandoned patch, formerly cultivated by *Ceratonia siliqua*.

**Conclusions**

The Central Administration in Spain holds only some responsibilities for nature management, such as promulgation of general legal regulations, the promotion of some inter-regional advisory criteria, and its role as interlocutor in international agreements such as CITES, the Bern Convention (Moreno Saiz et al., 1993). The 17 Autonomous Communities of Spain are fully authorized to develop legislation and establish policies related to the conservation of species and natural areas. This decentralisation is reflected in a great diversity and efficiency in solving problems, but it has also some drawbacks, such as the duplication of efforts and costs, or unbalanced protection measures of species among different regions (Moreno Saiz et al., 1993). However, due to their small area and simplic-

ity in legal and management terms, PMRs are extremely useful in a habitat fragmented territory (Heywood and Iriondo, 2003).

Many authors consider not only PMRs, but generally small scale protected areas as extremely important tools for conservation in hot-spots areas, where biodiversity but also the degree of threat are high (Medail and Quezel, 1999). The role of small reserves for plants and invertebrates are ideal for areas rich in species in the Iberian Peninsula (Gomez Campo and Herranz-Sanz, 1993, Laguna et al., 2004) or Cape region (Tansley, 1988). The success of this new concept of conservation is translated in the creation of PMRs in other countries of Europe, such as Greece, where seven sites from Western Crete were already proposed, or Slovenia, where 30 sites are in course of being declared in its karst region (Laguna et al., 2007). Increasing the number of PMRs in one region may contribute to the creation of a net of protected populations, which is of extreme utility in conservation management of endangered taxa.

*Acknowledgments*

The authors are grateful to Dr. Amparo Olivares, from the Conselleria de Medi Ambient, Aigua, Urbanism i Habitatge (Generalitat Valenciana) for her support in selecting the site and supporting the proposal of a new PMR.

**Syntaxonomic classification**

Cl. *Polygono-Poetea annuae* Rivas-Martínez 1975

Ord. *Polygono arenastri-Poetalia annuae* Tüxen in Géhu, Richard & Tüxen corr. Rivas-Martínez, Báscones, T.E. Díaz, Fernández-González & Loidi 1991

Al. *Polycarpion tetraphylli* Rivas-Martínez 1975

Ass. *Crassulo tillaeae-Saginetum apetalae* Rivas-Martínez 1975

Cl. *Stellarietea mediae* Tüxen, Lohmeyer & Preising ex von Rochow 1951

Ord. *Thero-Brometalia* (Rivas Goday & Rivas-Martínez ex Esteve 1973) O. Bolòs 1975

Al. *Taeniathero-Aegilopion geniculatae* Rivas-Martínez & Izco 1977

Ass. *Medicagini littoralis-Stipetum capensis* M.B. Crespo 2002

Cl. *Tuberarietea guttatae* (Br.-Bl. in Br.-Bl. *et al*. 1952) Rivas Goday & Rivas-Martínez 1963

Ord. *Brachypodietalia distachyi* Rivas-Martínez 1978

Al. *Brachypodion distachyi* Rivas-Martínez 1978

Ass. *Saxifrago tridactylitae-Hornungietum petraeae* Izco 1974

Cl. *Lygeo-Stipetea* Rivas-Martínez 1978

Ord. *Lygeo-Stipetalia* Br.-Bl. & O. Bolòs 1958

Al. *Thero-Brachypodion retusi* Br.-Bl. 1925

Ass. *Teucrio pseudochamaepityos-Brachypodietum* O. Bolòs 1957

Al. *Stipion tenacissimae* Rivas-Martínez 1978

Ass. *Heteropogono contorti-Stipetum tenacissimae* M.B. Crespo in De la Torre, M.B. Crespo & Solanas 1997

Al. *Stipion parviflorae* De la Torre, Alcaraz & Vicedo 1996

Ass. *Plantagini albicantis-Stipetum parviflorae* De la Torre, Alcaraz & Viñedo 1966

Cl. *Rosmarinetea officinalis* Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas 2002

Ord. *Rosmarinetalia officinalis* Br.-Bl. ex Molinier 1934

Al. *Rosmarino-Ericion multiflorae* Br.-Bl. in Br.-Bl., Font Quer, G. Braun- Blanquet, Frey, Jansen & Moor 1935

Ass. *Helianthemo mollis-Ulicetum parviflori* Stübing, Peris & Costa 1989

Cl. *Quercetea ilicis* Br.-Bl. ex A. & O. Bolòs 1950

Ord. *Pistacio lentisci-Rhamnetalia alaterni* Rivas-Martínez 1975

Al. *Asparago albi-Rhamnion oleoidis* Rivas Goday ex Rivas-Martínez 1975

Ass. *Querco cocciferae-Pistacietum lentisci* Br.-Bl., Font Quer, G. Braun- Blanquet, Frey, Jasen & Moor 1935

**Index of taxon names**

*Anthyllis terniflora* (Lag.) Pau
*Argyrolobium zanonii* (Turra) P. W. Ball
*Asparagus horridus* L. f.
*Asphodelus fistulosus* L.
*Asphodelus ramosus* L.
*Asterolinon linum-stellatum* (L.) Duby
*Avenula bromoides* (Gouan) H. Scholz subsp. *bromoides*
*Biscutella calduchii* (O. Bolòs & Masclans) Mateo & M. B. Crespo
*Brachypodium phoenicoides* (L.) Roem. et Schult.
*Brachypodium retusum* (Pers.) P. Beauv.
*Bromus madritensis* L.
*Calendula arvensis* L.
*Centaurea aspera* L. subsp. *stenophylla* (Dufuor) Nyman
*Centaurium quadrifolium* (L.) G. López & Jarvis subsp. *barrelieri* (Dufuor) G. López
*Ceratonia siliqua* L.
*Cistus clusii* Dunal
*Convolvulus althaeoides* L.
*Coris monspeliensis* L. subsp. *fontqueri* Mascl.
*Coronilla minima* L. subsp. *lotoides* (Koch) Nyman
*Crassula tillaea* Lester-Garland
*Dianthus broteri* Boiss. & Reut. subsp. *valentinus* (Willk.) Rivas Mart. & al.
*Dipcadi serotinum* (L.) Medik.
*Dorycnium pentaphyllum* Scop. subsp. *pentaphyllum*
*Euphorbia exigua* L.
*Euphorbia falcata* L.
*Filago pyramidata* L.

*Fumana thymifolia* (L.) Spach ex Webb
*Guillonea scabra* (Cav.) Coss.
*Helianthemum origanifolium* (Lam.) Pers. subsp. *glabratum* (Willk.) Guinea & Keywood
*Helianthemum salicifolium* (L.) Mill. subsp. *salicifolium*
*Helianthemum syriacum* (Jacq.) Dum.-Cours.
*Heteropogon contortus* (L.) P. Beauv. ex Roem. & Schult.
*Hippocrepis ciliata* Willd.
*Hornungia petraea* (L.) Reichenb.
*Hypochoeris glabra* L.
*Juniperus oxycedrus* L. subsp. *oxycedrus*
*Lolium rigidum* Gaudin
*Medicago littoralis* Rhode ex Loisel.
*Paronychia suffruticosa* (L.) DC.
*Pinus halepensis* Mill.
*Pistacia lentiscus* L.
*Plantago albicans* L.
*Polygala rupestris* Pourr.
*Quercus coccifera* L.
*Rhamnus oleoides* L. subsp. *angustifolia* (Lange) Rivas Goday & Rivas Mart.
*Rosmarinus officinalis* L.
*Rostraria cristata* (L.) Tzvelev
*Rubia peregrina* L. subsp. *longifolia* (Poir.) O. Bolòs
*Sagina apetala* Ard. subsp. *erecta* (Hornem.) Hermann
*Sideritis angustifolia* Lag. subsp. *angustifolia*
*Silene colorata* Poir.
*Stipa offneri* Breistr.
*Stipa parviflora* Desf.
*Stipa tenacissima* L.
*Teucrium capitatum* L. subsp. *capitatum*
*Teucrium edetanum* M. B. Crespo & al.
*Teucrium pseudochamaepitys* L.
*Thymelaea hirsuta* (L.) Endl.
*Thymus vulgaris* L. subsp. *aestivus* (Reut. ex Willk.) A. Bolòs & O. Bolòs
*Tolpis umbellata* Bertol.
*Tuberaria guttata* (L.) Fourr.
*Urginea undulata* (Desf.) Steinh. subsp. *caeculi*(Pau) M. B. Crespo
*Urospermum picroides* (L.) Scop. ex F. W. Schmid

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