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VASCULAR PLANT COMMUNITIES IN PORTUGAL (CONTINENTAL, THE AZORES AND MADEIRA)

by

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Vascular plant communities in Portugal (Continental, Azores and Madeira)

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Abstract

In this paper we propose a syntaxonomic scheme, according to the Code of Phytosociological Nomenclature for the vegetation of Portugal: continental and the Azores and Madeira archipelagos. The scheme encompasses 827 associations (4 communities), 245 alliances, 116 orders, and 64 vegetation classes. The 58 suballiances, 2 suborders and 4 subclasses, are also mentioned, as auxiliary ranks. For the higher syntaxa down to suballiance level, succinct ecological, physiognomic and chorological diagnosis has been made, and the characteristic species are related. New syntaxa names and corrections are described and listed in Annex I. It is also presented a floristic catalogue sheet with the syntaxonomic optimal for each taxon (Annex III). This list contains 2930 taxa.

Keywords: *Syntaxonomy, Phytosociology, Portugal.*

Introduction

The first and only representative list of syntaxa for continental Portugal was published in 1998 by Espírito Santo et al. (1988). Since then, knowledge of the phytosociological groupings in the country has evolved and made the document very out-dated and incomplete. Thus, we now present a revised version of the text for which we tried to gather all the syntaxa recognized in mainland Portugal, the Azores, Madeira and also for some neighbouring territories of Spain that have some probability of occurrence in Portugal. As all checklists, there are some risks and revision will be mandatory, namely of over-counting by including association names cited in older literature that are doubtful or had not been observed ever. Nevertheless, doubtful cases were excluded. We considered only the well-characterized communities in terms of stable floristic combinations observed by ourselves, those with a wide distribution, clear ecological setting and, in the case of seral vegetation, those representing metastable stages of succession. A brief description of the upper syntaxa (class, subclass, order, suborder, alliance and suballiance) are adduced.

We also attach a syntaxonomic annex where some syntaxa are proposed as new, as well as nomenclatural corrections. Finally the taxa mentioned in the document are grouped alphabetically in a floristic checklist with its phytosociological corresponding rank (rank where the taxon is found optimally).

Material and Methods

The syntaxonomic list was based on several former Iberian lists elaborated by Rivas-Martínez et al. (1999, 2001, 2002, 2011). A thorough search and review of all previous studies on vegetation in Portugal has also been made. The nomenclature followed is in accordance with the International Code of Phytosociological Nomenclature (Weber et al. 2000). Biogeographic and bioclimatic typologies follow Costa et al. (1999), Rivas-Martínez (2005, 2005a, 2007, 2011) and Rivas-Martínez et al. (2011).

Results

I. FLOATING OR ROOTED SUBMERGED AQUATIC VEGETATION

Ia. FRESH-WATER VEGETATION

1. CHARETEA FRAGILIS Fukarek ex Krausch 1964

Macroalgal underwater pioneer communities (charophytes) of pools, lakes and of rivers of shallow to medium-depth, with cosmopolitan distribution, that have not an high nutrient content (including dystrophic). This vegetation tends to colonize newly created aquatic habitats by man such as dams, channels, etc. that keep a clearly non-eutrophic or non-hyper-eutrophic state. (unpolluted).

Typus: Charetalia hispidae Sauer ex Krausch 1964 (1a.).
Characteristic species: *Chara fragilis*, *Chara vulgaris* var. *contraria*.

1a. CHARETALIA HISPIDAE Sauer ex Krausch 1964

Communities of fresh or brackish waters, alkaline (ionically rich), mainly colonized by algae of the genus *Chara*.

Typus: Charion fragilis Krausch 1964 (1.1.).

Characteristic species: *Chara braunii*.

1.1. Charion fragilis Krausch 1964 (1.1.1.)

Pioneer communities of macroalgae, not short-lived submerged in shallow clear water, and rich in calcium (mesotrophic).

Typus: Charetum asperae Corillion 1957. (1.1.1.)

Characteristic species: *Chara aspera*, *Chara connivens*, *Chara hispida*.

1.1.1. *Charetum asperae* Corillion 1957

1.1.2. *Charetum conniventis* Velayos, Carrasco & Cijurano 1989

1.1.3. *Charetum fragilis* Corillion 1957

1.1.4. *Charetum hispidae* Margalef 1947

1.2 Charion vulgaris Krause 1981 (1.2.1.)

Calcium-rich ephemeral submerged macroalgal pioneer communities that colonize from meso to bordering eutrophic waters.

Typus: Charetum vulgaris Corillion 1957 (1.2.1.)

Characteristic species: *Chara imperfecta*, *Chara vulgaris* var. *vulgaris*, *Tolypella glomerata*.

1.2.1. *Charetum vulgaris* Corillion 1957

1.2.2. *Tolypelletum glomeratae* Corillion 1957

1.3. Charion canescentis Krausche 1964

Submerged macroalgal communities that colonize brackish or even saltwater.

Typus: Charetum canescentis Corillion 1957 (1.3.1.)

Characteristic species: *Chara canescens*, *Lamprothamnium papulosum*.

1.3.1. *Charetum canescentis* Corillion 1957

1.3.2. *Lamprothamnetum papulosi* Corillion 1957

1b. NITELLETALIA FLEXILIS Krause 1969

Submerged macroalgal communities, with mainly temperate distribution, rich in species of the genus *Nitella*. Occurrence in acid to neutral freshwater.

Typus: Nitellion flexilis Damska 1966 (1.4.).

Characteristic species: *Nitella batrachosperma*, *Nitella capillaris*, *Nitella mucronata*, *Nitella opaca*, *Nitella translucens*.

1.4. Nitellion flexilis Damska 1966 (1.4.)

Submerged macroalgal communities of slightly acidic freshwater, in oceanic bioclimate.

Typus: Nitelletum flexilis Corillion 1957 (1.4.1.).

Characteristic species: *Nitella flexilis*, *Nitella gracilis*, *Nitella hyalina*.

1.4.1. *Nitelletum flexilis* Corillion 1957

1.5. Nitellion syncarpo-tenuissimae Krause 1969

Submerged macroalgal communities of neutral freshwaters, in semicontinental temperate bioclimate.

Typus: Nitelletum opacae Corillion 1957 (1.5.2.).

Characteristic species: *Nitella syncarpa*, *Nitella tenuissima*, *Tolypella prolifera*.

1.5.1. *Tolypelletum proliferae* Guerlesquin 1961

1.5.2. *Nitelletum opacae* Corillion 1957

2. LEMNETEA Tüxen ex O. Bolòs & Masclans 1955

Communities of small pleustophytes, macroscopic, of freshwater, dominated by not rooted plants, floating or submerged, with cosmopolitan distribution.

Typus: Lemnetalia minoris Tüxen ex O. Bolòs & Masclans 1955 (2a.).

2a. LEMNETALIA MINORIS Tüxen ex O. Bolòs & Masclans 1955

Order unique in Europe, with subcosmopolitan distribution.

Typus: Lemnion minoris Tüxen ex O. Bolòs & Masclans 1955 (2.1.).

Characteristic species: *Azolla filiculoides*, *Lemna minor*, *Spirodela polyrhiza*, *Wolffia arrhiza*.

2.1. Lemnion minoris Tüxen ex O. Bolòs & Masclans 1955

Macroscopic not rooted plant communities (lemnids), who live floating (acropleustophytes) in eutrophic to hypereutrophic water, rich in ions and often microbiologically contaminated.

Typus: Lemno gibbae-Azolletum filiculoidis Br.-Bl. in Br.-Bl., Roussine & Nègre 1952 (2.1.3.).

Characteristic species: *Lemna gibba*.

2.1.1. *Lemnetum gibbae* Miyawaki & J. Tüxen 1960

2.1.2. *Lemnetum minoris* Oberdorfer ex Müller & Görs 1960

2.1.3. *Lemno gibbae-Azolletum filiculoidis* Br.-Bl. in Br.-Bl., Roussine & Nègre 1952

2.1.4. *Lemno-Spirodeletum polyrhizae* Koch 1954

2.2. Lemnion trisulcae Den Hartog & Segal ex Tüxen & Schwabe in Tüxen 1974

Communities of lemnids and of mesopleustophytes (suspended between the bottom and the surface). Generally colonizing mesotrophic water (shallower than the previous alliance).

Typus: Lemnetum trisulcae Knapp & Stoffers 1962 (2.2.1.).

Characteristic species: *Lemna trisulca*.

2.2.1. *Lemnetum trisulcae* Knapp & Stoffers 1962

3. POTAMETEA Klika in Klika & V. Novák 1941

Communities of rooted hydrophytes and large pleustophytes of freshwater or slightly saline water.

Typus: Potametalia pectinati Koch 1926 (3a.).

Characteristic species: *Callitriche brutia*, *Callitriche lusitanica*, *Myriophyllum spicatum*, *Potamogeton crispus*, *Potamogeton pectinatus*.

3a. POTAMETALIA PECTINATI Koch 1926

Holarctic communities from nymphaeids, elodeids, myriophyllids and batrachids rooted in freshwater or slightly saline water. They are characteristic of eutrophic (exceptionally hypereutrophic) to mesotrophic waters, from low kinetic energy (stagnant) to high-energy water (fast current).

Typus: Potamion pectinati (Koch 1926) Görs 1977 (3.1.).

Characteristic species: *Elodea canadensis*, *Hippuris vulgaris*, *Potamogeton lucens*, *Potamogeton perfoliatus*, *Zannichellia palustris*, *Zannichellia peltata*.

3.1. Potamion lutescentis (Koch 1926) Rivas-Martínez 1973

[*Potamion pectinati* (Koch 1926) Görs 1977]

Associations dominated by elodeids (plants with undivided leaves submerged and floating leaves) and some myriophyllids, of oligo-haline freshwater, of

permanent level, moderately deep (0.5 to 5 m), mildly exposed to the wind, waves and currents.

Typus: Potamo pectinati-Zannichellietum palustris Koch 1926.

Characteristic species: *Potamogeton gramineus*, *Potamogeton trichoides*.

3.1.1. *Myriophyllo alterniflori-Potametum crispum* Rivas Goday 1964

3.1.2. *Potametum lucentis* Hueck 1931

3.1.3. *Potametum pectinati* Cartensen 1955

3.1.4. *Potamo pectinati-Myriophylletum spicati* Rivas Goday 1964 corr. Conesa 1990

3.1.5. *Potametum perfoliato-crispi* Bellot 1951

3.2. Nymphaeion albae Oberdorfer 1957

Large rooted plant communities of freshwater, composed mainly by nymphaeids (plants with branched stems and petioles with large floating leaves). It colonizes calm waters, stagnant or of weak current, mesotrophic to eutrophic, moderately deep (1-4 m deep) and without ripple.

Typus: Nymphaeo albae-Nupharetum luteae Nowinski 1928 (3.2.2.).

Characteristic species: *Myriophyllum verticillatum*, *Nuphar lutea*, *Nymphaea alba*, *Polygonum amphibium*, *Potamogeton natans*.

3.2.1. *Myriophyllo alterniflori-Potametum natantis* Rivas-Martínez, Fernández-González, Sánchez-Mata, Pizarro & Sardinero 2002

3.2.2. *Nymphaeo albae-Nupharetum luteae* Nowinski 1928 nom. mut. (fig.1, page 103)

[*Nymphaeetum albae-luteae* Nowinski 1928]

3.3. Ranunculion aquatilis Passarge 1964

Freshwater communities of small rooted plants, dominated by batrachids, occurring in stagnant shallow waters or of weak current. They can withstand an occasional emersion during the summer unlike what happens with the former alliances. They colonize mesotrophic waters often overlaid with nutrient-rich sediments

Typus: Ranunculetum aquatilis Géhu 1961.

Characteristic species: *Callitriche cribosa*, *Callitriche stagnalis*, *Ranunculus peltatus*, *Ranunculus saniculifolius*, *Ranunculus trichophyllus*, *Ranunculus tripartitus*.

3.3.1. *Callitrichetum regis-jubae* Galán in A.V. Pérez, Galán, P. Navas, D. Navas, Y. Gil & Cabezudo 1999

3.3.2. *Callitricho brutiae-Ranunculetum peltati* Pizarro & Rivas-Martínez 2002

3.3.3. *Callitricho stagnalis-Ranunculetum saniculifolii* Galán in A.V. Pérez, Galán, P. Navas, D. Navas, Y. Gil & Cabezudo 1999

3.3.4. *Ranunculetum tripartiti* Galán in A.V. Pérez, Galán, P. Navas, D. Navas, Y. Gil & Cabezudo 1999

3.4. Ranunculion fluitantis Neuhäusl 1959

Associations of small freshwater rooted plants, typical of oligotrophic to eutrophic running waters, dominated by batrachids.

Typus: Ranunculetum fluitantis Allorge 1922.

Characteristic species: *Callitriche hamulata*, *Callitriche obtusangula*, *Groenlandia densa*, *Potamogeton nodosus*, *Ranunculus penicillatus*, *Ranunculus pseudofluitans*.

3.4.1. *Callitriche brutiae-Ranunculetum pseudofluitantis* Pizarro, Melendo & Rivas-Martínez 2002

3.4.2. *Callitriche lusitanicae-Ranunculetum penicillati* Pizarro 2002

3.5. *Zannichellion pedicellatae* Schaminée, Lanjouw & Schipper 1990 em. Pott 1992

Elodeids communities in brackish waters.

Typus: Zannichellietum pedicellatae Nordhagen 1954.

Characteristic species: *Najas marina*, *Najas minor*.

3.5.1. *Najadetum marinae* Fukarek 1961

3b. *UTRICULARIETALIA* Den Hartog & Segal 1964

Communities of large pleustophytes not rooted, floating in the surface or submerged between the surface and some depth, in oligotrophic to eutrophic waters.

Typus: Utricularion vulgaris Passarge 1964 (3.6.).

3.6. *Utricularion vulgaris* Passarge 1964

Communities of utriculariids (with emerged flowers and fruits) with leaf structures adapted to heterotrophy, allowing them to live in acidic oligo-mesotrophic waters. They are found in shallow, stagnant or low current water, tolerating high temperatures in the summer.

Typus: Lemno minoris-Utricularietum vulgaris Soó ex Passarge 1964.

Characteristic species: *Utricularia australis*, *Utricularia gibba* subsp. *exoleta*.

3.1.1. *Utricularietum exoleta-australis* Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980

3.7. *Ceratophyllion demersi* Den Hartog & Segal ex Passarge 1996

Freshwater communities, composed of hydrophytes with submerged flowers, leaves finely divided, and without floating leaves, which grow freely between the surface and bottom (mesopleustophytes). In spring and summer the community is located in the superficial layers of water, and goes down to the bottom in autumn when vegetative activity is lower. Large masses of plants formed by vegetative propagation can completely fill the biotope from the surface to the bottom. Their optimal growth is in small ponds or canals of eutrophic freshwater.

Typus: Potamo-Ceratophylletum demersi Hild & Rehnelt 1965 (3.2.1.).

Characteristic species: *Ceratophyllum demersum*.

3.2.1. *Potamo-Ceratophylletum demersi* Hild & Rehnelt 1965

Ib. MARINE AND SALT-WATER VEGETATION

4. *HALODULO WRIGHTII-THALASSIETEA TESTUDINUM* Den Hartog ex Rivas-Martínez, Fernández-González & Loidi 1999

Benthic infralittoral seagrass and macrothallophyte communities, on muddy or sandy substrata of calm shallow coasts, lagoons, estuaries and reefs (can reach up to 15-20

m deep). Distribution is tropical and subtropical regions, mainly in the infra to thermotropical belts, but reaching the subtropical areas: infra to thermomediterranean and infratempere thermotypes (but not cold seas).

Typus: Thalassio testudinum-Syringodietalia filiformis Borhidi, Muñiz & Del Risco in Borhidi 1996 (4a.).

Characteristic species: *Cymodocea nodosa*.

4a. *THALASSIO TESTUDINUM-SYRINGODIETALIA FILIFORMIS* Borhidi, Muñiz & Del Risco in Borhidi 1996

Single order.

Typus: Syringodio-Thalassion testudinum Borhidi 1996.

4.1. *Cymodoceion nodosae* Den Hartog 1976

Pioneer communities on non-cohesive marine substrates, from sea level to sublittoral waters, reaching 10-12m of depth on calm sandy coasts. Tropical, subtropical Atlantic and Mediterranean distribution.

Typus: Cymodoceetum nodosae Feldmann 1937 (4.1.1.).

4.1.1. *Cymodoceetum nodosae* Feldmann 1937

5. *RUPPIETEA* J. Tüxen 1960

Species-poor halophytic vegetation of cormophytes and bryophytes of Holarctic distribution. Found in flooded areas, at least temporarily, in brackish and marine salt-water or in continental poly-haline water.

Typus: Ruppialia maritima J. Tüxen 1960 (5a.).

5a. *RUPPIETALIA MARITIMAE* J. Tüxen 1960

Single order in the Iberian Peninsula.

Typus: Ruppion maritima Br.-Bl. ex Westhoff in Benne-
ma, Sissingh & Westhoff 1943 (5.1.).

5.1. *Ruppion maritima* Br.-Bl. ex Westhoff in Benne-
ma, Sissingh & Westhoff 1943

Filiform hydrophytic communities, found in areas of brackish water with no opening to the sea (e.g. salt-water pools, lagoons, abandoned salt pans, blocked inlets, drains, canals, dams, reservoirs) tolerating a large amplitude of salinity variation, and occasionally, drought in the summer. These communities can be found in places with higher salinities than the sea. In inland waters, where the salinity is nearly constant, this alliance occurs only in habitats subjected to a certain instability of the hydrographic conditions. Yet, in areas subjected to tidal movements, can only develop in conditions of very small tide amplitudes.

Typus: Ruppium maritima Hocquette 1927.

Characteristic species: *Ruppia cirrhosa*, *Ruppia maritima*.

5.1.1. *Enteromorpha intestinalidis-Ruppium maritima* Westhoff ex Tüxen & Böckelmann 1957

6. *ZOSTERETEA MARINAE* Pignatti 1953

Vegetation of coasts or estuaries in shallow marine waters (0.3 to 4 m), consisting of submerged perennial monocotyledons, which are rooted in a sandy loam or mobile substrata. The communities that occupy the sub-coastal areas, are submerged not more than 2-3 hours in each tidal cycle. Holarctic distribution.

Typus: Zosteretalia Béguinot ex Pignatti 1953 (6a.).

Characteristic species: *Zostera noltii*, *Zostera marina*.

6a. ZOSTERETALIA Béguinot ex Pignatti 1953

Single order.

Typus: Zosterion Br.-Bl. & Tüxen ex Pignatti 1953 (6.1.).**6.1. Zosterion** Br.-Bl. & Tüxen ex Pignatti 1953

Single alliance.

Typus: Zosteretum marinae van Goor ex Pignatti 1953 (6.1.1.).6.1.1. *Zosteretum marinae* van Goor ex Pignatti 19536.1.2. *Zosteretum noltii* Harmsen 1936**II. AMPHIBIOUS VEGETATION OF FRESH-WATER, SPRINGS AND FENS****IIA. PIONEER EPHEMERAL VEGETATION****7. BIDENTETEA TRIPARTITAE** Tüxen, Lohmeyer & Preising ex von Rochow 1951

Pioneer annuals on periodically flooded nutrient-rich pools, lake margins and riparian nitrophilous habitats. With Holarctic distribution, their phenological maximum is mainly in the summer.

Typus: Bidentetalia tripartitae Br.-Bl. & Tüxen ex Klika & Hadač 1944 (7a.).Characteristic species: *Pulicaria vulgaris*.**7a. BIDENTETALIA TRIPARTITAE** Br.-Bl. & Tüxen ex Klika & Hadač 1944

Single order.

Typus: Bidentetion tripartitae (Koch 1926) Nordhagen 1940 (7.1.).Characteristic species: *Bidens tripartita*, *Polygonum hydropiper*, *Polygonum lapathifolium*, *Ranunculus sceleratus*, *Rorippa palustris*, *Xanthium strumarium* subsp. *italicum*.**7.1. Bidentetion tripartitae** (Koch 1926) Nordhagen 1940

Amphibious vegetation of clayey or muddy margins of eutrophic water courses (standing water or slow current).

Typus: Bidentetum tripartitae Koch 1926Characteristic species: *Alopecurus aequalis*, *Bidens aurea*, *Bidens frondosa*, *Polygonum minus*.7.1.1. *Bidenti tripartitae-Polygonetum lapathifolii* Rivas-Martínez, Belmonte, Fernández-González & Sánchez-Mata in Sánchez-Mata 19897.1.2. *Cypero micheliani-Ranunculetum trilobi* Rivas Goday 1964 corr. J.C. Costa, V. Silva & Neto hoc loco[*Cypero micheliani-Ranunculetum sardoi* Rivas Goday 1964]7.1.3. *Cypero eragrostis-Bidentetum frondosae* Amigo in Lazaroa 27: 46, 20067.1.4. *Filaginello uliginosae-Bidentetum tripartitae* Amigo in Lazaroa 27: 47, 20067.1.5. *Xanthio italici-Polygonetum persicariae* O. Bolòs 1957[*Chenopodio ambrosioidis-Polygonetum lapathifolii* Peinado, Bartolomé, Martínez-Parras & Andrade 1988]**7.2. Chenopodion rubri** (Tüxen in Poli & J. Tüxen 1960) Hibig & Jage 1972

Pioneer vegetation of stream banks with coarse texture, that dry up in the summer.

Typus: Chenopodietum rubri Timér 1950.Characteristic species: *Chenopodium chenopodioides*, *Chenopodium glaucum*, *Chenopodium pumilum*, *Corrigiola litoralis*.7.2.1. *Amarantho-Chenopodietum botryoidis* Martínez-Parras, Peinado, Bartolomé & Molero 1988**8. ISOETO-NANOJUNCETEA** Br.-Bl. & Tüxen ex Br.-Bl., Roussine & Nègre 1952

Holarctic vegetation of pioneer ephemeral isoetid communities dominated by annuals and dwarf perennials on periodically flooded bare soils.

Typus: Isoetetalia Br.-Bl. 1936 (8a.).Characteristic species: *Cardamine parviflora*, *Centaureum pulchellum*, *Centunculus minimus*, *Damasonium alisma*, *Damasonium bourgaei*, *Damasonium polyspermum*, *Elatine macropoda*, *Hypericum humifusum*, *Juncus ambiguus*, *Juncus bufonius*, *Juncus sphaerocarpus*, *Juncus tenageia* subsp. *tenageia*, *Lythrum hyssopifolia*, *Lythrum portula*, *Lythrum thymifolia*, *Mentha pulegium*, *Ranunculus muricatus*, *Veronica acinifolia*, *Veronica anagalloides*.**8a. ISOETETALIA** Br.-Bl. 1936

Pioneer, amphibious and hygrophilous communities, flowering in spring or early summer. Mediterranean and Western Europe distribution.

Typus: Isoetion Br.-Bl. 1936 (8.1.).Characteristic species: *Antinoria agrostidea* var. *annua*, *Crassula vaillantii*, *Juncus capitatus*, *Juncus hybridus*, *Juncus pygmaeus*, *Ophioglossum lusitanicum*.**8.1. Isoetion** Br.-Bl. 1936

Mediterranean amphibious or fleeting vegetation, of in small ponds or depressions temporarily flooded by surface water, with a phenological maximum in late-winter or early spring.

Typus: Isoetetum durieui Br.-Bl. 1936 (8.1.1.).Characteristic species: *Centaureum maritimum*, *Isoetes duriaei*, *Isoetes histrix*, *Lotus angustissimus*, *Lythrum borysthenticum*, *Myosotis retusifolia*, *Phymatoceros bulbiculosus*, *Pilularia minuta*, *Riccia beyrichiana*, *Riccia bifurca*, *Riccia ciliifera*, *Solenopsis laurentia*.8.1.1. *Isoetetum durieui* Br.-Bl. 19368.1.2. *Juncus capitati-Isoetetum histricis* Br.-Bl. 19368.1.3. *Lythro thymifoliae-Crassuletum vaillantii* Rivas Goday ex Ruiz & A. Valdés 19878.1.4. *Solenopsis laurentiae-Juncetum hybridi* Rivas Goday & Borja in Rivas Goday 1968 corr. V. Silva & Galán de Mera in V. Silva, Galán de Mera & Sérgio in Silva Lusit. 16 (2): 269, 2008[*Laurentiae-Juncetum tingitanae* Rivas Goday & Borja in Rivas Goday 1968]8.1.5. *Solenopsis laurentiae-Juncetum pygmaei* Rivas Goday ex V. Silva & Galán de Mera in V. Silva, Galán de Mera & Sérgio in Silva Lusit. 16 (2): 269-270, 2008

8.1.6. *Solenopsis laurentiae-Phymatoceretum bulbiculosi* Br.-Bl. 1936 nom. mut.
[*Laurentiae-Anthocerotetum dichotomi* Br.-Bl. 1936]

8.2. *Menthion cervinae* Br.-Bl. ex Moor 1937 nom. mut.

[*Preslion cervinae* Br.-Bl. ex Moor 1937]

Associations of long tall therophytes and creeping perennials, flooded by relatively deep water over a long period in spring and desiccating in the summer.

Typus: Preslietum cervinae Br.-Bl. ex Moor 1937.

Characteristic species: *Eryngium corniculatum*, *Isoetes setaceum*, *Isoetes velatum* subsp. *velatum*, *Juncus tenageia* subsp. *perpusillus*, *Marsilea batardae*, *Mentha cervina*, *Myosotis debilis*, *Ranunculus nodiflorus*, *Sisymbrella aspera*.

8.2.1. *Cypero badii-Preslietum cervinae* Rivas Goday 1955

8.2.2. *Eryngio corniculati-Isoetetum setacei* (Rivas Goday 1957) V. Silva, J.A. Molina, J.C. Costa, P. Cruz & Espírito Santo in Acta Bot. Malacitana 34: 237-239, 2009

[*Isoeto setacei-Scirpetum maritime eryngietosum corniculati* Rivas Goday 1957 p.p., ass. prov. *Peplis erecta* et *Juncus pygmaeus* Rivas Goday 1964 p.p.]

8.2.3. *Eryngio corniculati-Preslietum cervinae* Rivas Goday 1957

8.2.4. *Juncetum perpusilli* Rivas-Martínez 1964 nom. mut.

[*Juncetum nanae* Rivas-Martínez 1964]

8.2.5. *Junco pygmaei-Isoetetum velati* Rivas Goday in Rivas Goday et al. 1956

8.3. *Agrostion pourretii* Rivas Goday 1958 nom. mut.
[*Agrostion salmanticae* Rivas Goday 1958]

Graminoid ephemeral vegetation on wet depressions flooded for a short period.

Typus: Pulicario paludosae-Agrostietum pourretii Rivas Goday 1955 nom. mut. (8.3.2.).

Characteristic species: *Agrostis pourretii*, *Allium scorzonifolium*, *Carlina racemosa*, *Chaetopogon fasciculatus*, *Eryngium galioides*, *Lotus parviflorus*, *Pulicaria paludosa*.

8.3.1. *Loto hispidi-Chaetopogonetum fasciculati* Rivas-Martínez & Costa in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980 nom. mut.
[*Loto subbiflori-Chaetopogonetum fasciculati* Rivas-Martínez & Costa in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980]

8.3.2. *Pulicario paludosae-Agrostietum pourretii* Rivas Goday 1955 nom. mut.

[*Pulicario uliginosae-Agrostietum salmanticae* Rivas Goday 1955, *Peplido erectae-Agrostietum salmanticae* Rivas Goday 1955]

8.4. *Cicendion* (Rivas Goday in Rivas Goday & Borja 1961) Br.-Bl. 1967

Ephemeral fleeting communities, dominated by small plants flowering in spring, in waterlogged biotopes covered by surface or shallow water. Mediterranean

West Iberian, Cantabrian-Atlantic, Azorean and Madeira distribution.

Typus: Hypno lindebergii-Cicendietum filiformis Allorge 1922.

Characteristic species: *Cicendia filiformis*, *Erygium viviparum*, *Exaculum pusillum*, *Illecebrum verticillatum*, *Isolepis pseudosetacea*, *Kickxia cirrhosa*, *Radiola linoides*, *Ranunculus longipes*, *Sedum maireanum*, *Trifolium ornithopodioides*.

8.4.1. *Arenario conimbricensis-Sedetum maireani* Castro Antunes & J.C. Costa in Acta Bot. Malacitana 36: 207-208, 2011

8.4.2. *Anthemido nobilis-Menthetum pulegii* Lüpnitz 1976

8.4.3. *Holco gayani-Bryetum alpini* Jansen in Jansen & Sequeira 1999

8.4.4. *Hyperico humifusi-Cicendietum filiformis* Rivas Goday (1964) 1971

8.4.5. *Illecebro verticillatae-Lotetum parviflorae* J.C. Costa, Capelo, Jardim, Sequeira, Lousã, Espírito Santo & Rivas-Martínez in Silva Lusit. 11(2): 255, 2003

8.4.6. *Isoeto-Cicendietum* Br.-Bl. 1967

8.4.7. *Jonopsidio abulensis-Sedetum maireani* Aguiar, Monteiro-Henriques & Sánchez-Mata in Lazaroa 33: 2012
[*Jonopsidio abulensis-Sedetum maireani* Aguiar 2001 nom. inval. (art.1)]

8.4.8. *Periballio laevis-Illecebrum verticillati* Rivas Goday 1954

8b. NANOCYPERETALIA Klika 1935

Late summer and autumn flowering communities on flooded biotopes.

Typus: Nanocyperion flavescens Koch ex Libbert 1932 (8.5.).

Characteristic species: *Cyperus flavescens* (*Pycneus flavescens*), *Cyperus michelianus*, *Elatine triandra*, *Gnaphalium uliginosum*, *Lythrum tribracteatum*, *Physcomitrium pyriforme*, *Pseudognaphalium luteo-album*, *Riccia crystallina*.

8.5. *Nanocyperion flavescens* Koch ex Libbert 1932

Dwarf graminoid, acidophilous, freshwater communities.

Typus: Elatino alsinastrum-Juncetum tenageiae Libbert ex W. Fischer 1973.

Characteristic species: *Centaurium chloodes*, *Cyperus fuscus*, *Elatine alsinastrum*, *Isolepis cernua*, *Isolepis setacea*, *Ludwigia palustris*.

8.5.1. *Gnaphalio-Isolepidetum pseudosetacei* Rivas Goday 1970

8.5.2. *Gnaphalio uliginosi-Spergularietum capillaceae* L. Herrero, M.E. Garcia, T.E. Díaz, Penas & F. Salegui 2002

8.5.3. *Ludwigio palustris-Cyperetum micheliani* Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980

8.6. *Verbenion supinae* Slavnic 1951

[*Heleochoilon schoenoidis* Br.-Bl. ex Rivas Goday 1956 in *Anales Inst. Bot. Cavanilles* 13: 366, *typus* (lecto, hoc loco): *Heleochoilo schoenoidis-Fimbristyletum dichotomae* Br.-Bl. & Rivas Goday in Rivas Goday 1956, l.c., pag 367, tb. 11, vol 4]

Brackish to oligohaline water communities.

Typus: Heliotropio supini-Verbenetum supinae Slavnic 1951.

Characteristic species: *Blackstonia imperfoliata*, *Crypsis aculeata*, *Crypsis alopecuroides*, *Crypsis schoenoides*, *Glinus lotoides*, *Fimbristylis bisumbellata*, *Heliotropium supinum*, *Verbena supina*.

8.6.1. *Crypsio schoenoidis-Fimbristyletum bisumbellatae* Br.-Bl. & Rivas Goday in Rivas Goday 1956 corr. Brullo & Minisale 1998 nom. mut.

[*Heleochoilo schoenoidis-Fimbristyletum bisumbellatae* Br.-Bl. & Rivas Goday in Rivas Goday 1956 corr. Brullo & Minisale 1998, *Heleochoilo schoenoidis-Fimbristyletum dichotomae* Br.-Bl. & Rivas Goday in Rivas Goday 1956]

8.6.2. *Cypero micheliani-Heleocholetum alopecuroidis* Rivas Goday & E. Valdés in Rivas Goday 1970**8.6.3. *Damasonio bourgaei-Crypsietum aculeatae* Rivas-Martínez & Costa in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980 corr. V. Silva & J.C. Costa hoc loco**

[*Damasonio alismatis-Crypsietum aculeatae* Rivas-Martínez & Costa in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980]

8.6.4. *Glino lotoidis-Verbenetum supinae* Rivas Goday 1964**8.6.5. *Heliotropio supini-Crypsietum schoenoides* Rivas Goday 1955****8.6.6. *Verbeno supinae-Gnaphalietum* Rivas Goday 1970****Iib. VEGETATION OF LAKES, SPRINGS, FENS AND BOGS****9. *LITTORELLETEA UNIFLORAE* Br.-Bl. & Tüxen ex Westhoff, Dijk & Passchier 1946**

[*Isoeto-Littorelletea* Br.-Bl. & Vlieger In Vlieger 1937 (art. 35)]

Holarctic vegetation of dwarf helophyte amphibious oligotrophic communities, in shores of dystrophic lakes and clearings of disturbed peat-bogs and fens, of nutrient-poor standing or slow-flowing waters.

Typus: Littorelletalia uniflorae Koch ex Tüxen 1937 (9a.).

9a. *LITTORELLETALIA UNIFLORAE* Koch ex Tüxen 1937

Single order in Iberian Peninsula.

Typus: Littorellion uniflorae Koch ex Tüxen 1937 (9.1.).

Characteristic species: *Hydrocotyle vulgaris*, *Juncus bulbosus*, *Littorella uniflora*, *Marsilea quadrifolia*, *Myriophyllum alterniflorum*, *Potamogeton polygonifolius*, *Sparganium angustifolium*, *Veronica scutellata*.

9.1. *Littorellion uniflorae* Koch ex Tüxen 1937

Amphibious vegetation of nutrient-poor deep standing water. Distribution: Atlantic and Orocantabrian and Mediterranean West Iberian high mountains.

Typus: Isoeto lacustris-Lobelietum dortmannae Tüxen 1937.

Characteristic species: *Antinoria agrostidea* var. *nantans*, *Isoetes azorica*, *Ranunculus ololeucos*.

9.1.1. *Isoetetum azoricae* Lüpnitz 1976**9.1.2. *Sparganio angustifolii-Isoetetum lereschi* Rivas-Martínez 1964 corr. Rivas-Martínez & Prada in Rivas-Martínez, Costa, Izco & Sáenz 1982****9.2 *Eleocharition multicaulis* Vanden Berghen 1969**

Atlantic and Mediterranean West Iberian communities in river beds and banks of ponds, subjected to periodic submersion by shallow meso-oligotrophic waters.

Typus: Eleocharitetum multicaulis Allorge 1922 ex Tüxen 1937 (9.2.1.).

Characteristic species: *Apium inundatum*, *Baldellia alpestris*, *Baldellia ranunculoides*, *Eleocharis multicaulis*, *Eleogiton fluitans*, *Hypericum elodes*, *Juncus emmanuelis*, *Juncus heterophyllus*, *Myosotis lusitanica*, *Pilularia globulifera*, *Rhynchospora modesti-lucennoi*.

9.2.1. *Eleocharitetum multicaulis* Allorge 1922 ex Tüxen 1937**9.2.2. *Fontinali antypireticae-Ranunculetum ololeuci* Br.-Bl., P. Silva, Rozeira & Fontes 1952 nom. mut.**

[*Fontinali antypireticae-Ranunculetum lusitanici* Br.-Bl., P. Silva, Rozeira & Fontes 1952]

9.2.3. *Hyperico elodis-Potametum oblongi* (Allorge 1926) Br.-Bl. & Tüxen 1952**9.2.4. *Hyperico elodis-Rhynchosporetum modesti-lucennoi* Neto, Capelo, J.C. Costa & Lousã in Neto 1997 corr. Neto, Capelo, J.C. Costa & Lousã hoc loco (fig. 2, page 103)**

[*Hyperico elodis-Rhynchosporetum rugosae* Neto, Capelo, J.C. Costa & Lousã in Neto 1997]

9.2.5. *Hyperico elodis-Scirpetum fluitantis* Rivas Goday 1964**9.2.6. *Juncus emmanuelis-Eleocharitetum multicaulis* Rivas-Martínez & Costa in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980****9.2.7. *Ludwigio palustris-Potametum polygonifolii* Peinado & A. Velasco in Peinado, Moreno & A. Velasco 1983****9.2.8. *Scirpo fluitantis-Juncetum heterophylli* Rivas-Martínez & Costa in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980****9.3. *Eleocharition acicularis* Pietsch ex Diersen 1975**

Continental floating communities on loamy substrates.

Typus: Littorello uniflorae- Eleocharitetum acicularis Chouard 1924.

Characteristic species: *Elatine hexandra*, *Eleocharis acicularis*.

9.3.1. Community of *Eleocharis acicularis*

10. MONTIO FONTANAE-CARDAMINETEA AMARAE Br.-Bl. & Tüxen ex Br.-Bl. 1948

Holarctic cold-water mountain spring communities, dominated by bryophytes and evergreen soft helophyte phanerogams.

Typus: Montio fontanae-Cardaminetalia amarae Pawłowski in Pawłowski, Sokołowski & Wallisch 1928 (10a.).

10a. MONTIO FONTANAE-CARDAMINETALIA AMARAE Pawłowski in Pawłowski, Sokołowski & Wallisch 1928

Single order in Iberian Peninsula.

Typus: Cardamino amarae-Montion fontanae Br.-Bl. 1926 (10.1.).

Characteristic species: *Brachythecium rivulare*, *Cinclidotus fontinaloides*, *Epilobium anagallidifolium*, *Epilobium obscurum*, *Hygrohypnum luridum*, *Marsipella emarginata*, *Montia fontana* subsp. *amporitana*, *Nardia compressa*, *Pellia epiphylla*, *Philonotis fontana*, *Pohlia wahlenbergii*, *Scapania undulata*, *Stellaria alsine*, *Trichocolea tomentella*.

10.1. Cardamino amarae-Montion fontanae Br.-Bl. 1926

Oro to cryorotemperate cold springs vegetation of base-poor water. Alpine-Pyrenean distribution with Orocantabrian and Estrelensean disjunctions.

Typus: Montio fontanae-Bryetum schleicheri Büker & Tüxen in Büker 1942.

Characteristic species: *Bryum schleicheri*, *Caltha palustris* subsp. *minor*, *Philonotis seriata*, *Philonotis tomentella*.

10.1.1. Stellario alsines-Saxifragetum alpigenae Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas 1984

10.2. Caricion remotae Kästner 1941

Meso to supratemperate helophytic phanerogams communities in oligotrophic cold soft running waters.

Typus: Caricetum remotae Kästner 1941.

Characteristic species: *Cardamine flexuosa*, *Chrysosplenium oppositifolium*, *Sibthorpia europaea*.

10.2.1. Cardamino flexuosae-Chrysosplenietum oppositifolii O. Bolòs 1979

10.2.2. Sagino procumbentis-Sibthorpietum europaeae Honrado, P. Alves & B. Caldas in Laza-roa 24: 34, 2003

10.2.3. Saxifragetum lepismigenae Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas 1984

10.2.4. Stellario uliginosae-Montietum variabilis Foucault 1981

10.3. Myosotidion stoloniferae Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas 1984

Oroiberian, Carpetan-Leonese, Estrelensean and Western Orocantabrian oligotrophic sprigs communities.

Typus: Myosotidetum stoloniferae Br.-Bl., P. Silva, Rozeira & Fontes 1952 (10.3.1.).

Characteristic species: *Myosotis stolonifera*, *Veronica langei*.

10.3.1. Myosotidetum stoloniferae Br.-Bl., P. Silva, Rozeira & Fontes 1952

10.4. Ranunculion omiophyllo-hederacei Rivas-Martínez, Fernández-González, Sánchez-Mata, Pizarro & Sardinero 2002

Muddy slow flowing cold springs communities, dominated by rooted stoloniferous helophyte ranunculids. Atlantic and Mediterranean West Iberian distribution.

Typus: Montio amporitanae-Ranunculetum hederacei Rivas-Martínez, Fernández-González, Sánchez-Mata, Pizarro & Sardinero 2002 (10.4.1.).

Characteristic species: *Ranunculus hederaceus*, *Ranunculus omiophyllus*.

10.4.1. Montio amporitanae-Ranunculetum hederacei Rivas-Martínez, Fernández-González, Sánchez-Mata, Pizarro & Sardinero 2002

10.4.2. Myosotido stoloniferae-Ranunculetum omiophylli Rivas-Martínez, Fernández-González, Sánchez-Mata, Pizarro & Sardinero 2002

10.4.3. Ranunculetum omiophylli Br.-Bl. & Tüxen ex Pizarro 1995

11. MAGNOCARICI ELATAE-PHRAGMITETEA AUSTRALIS Klika in Klika & Novák 1941 nom. inv.

[*Phragmito-Magnocaricetea* Klika in Klika & Novák 1941]

Swampy, fenny, lacustrine and riparian helophyte vegetation, dominated by perennial graminoids, sedges, forbs and herbs of fresh and brackish waters. Cosmopolitan distribution.

Typus: Phragmitetalia australis Koch 1926 (11a.).

Characteristic species: *Alisma plantago-aquatica*, *Butomus umbellatus*, *Carex pseudocyperus*, *Eleocharis palustris* subsp. *vulgaris*, *Glyceria fluitans*, *Gratiola linifolia*, *Lycopus europaeus*, *Lythrum salicaria*, *Oenanthe fistulosa*, *Phragmites australis*, *Rorippa amphibia*, *Schoenoplectus pungens*, *Sparganium erectum* subsp. *erectum*, *Veronica anagallis-aquatica*.

11a. PHRAGMITETALIA AUSTRALIS Koch 1926

Tall fresh water tall-graminoid or long-blade helophyte communities. Distribution cosmopolitan.

Typus: Phragmition australis Koch 1926 (11.1.).

Characteristic species: *Iris pseudacorus*, *Mentha aquatica*, *Sagittaria sagittifolia*, *Schoenoplectus lacustris*, *Schoenoplectus tabernaemontani*, *Typha domingensis*.

11.1. Phragmition australis Koch 1926

Single alliance in Europe.

Typus: Schoenoplecto-Phragmitetum australis Koch 1926.

Characteristic species: *Sparganium emersum*, *Typha latifolia*.

11.1a. Phragmitenion australis (Koch 1926) Rivas-Martínez in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980

Tall graminoid, long-blade communities sensitive to long dry periods.

Typus: Schoenoplecto-Phragmitetum australis Koch 1926.

Characteristic species: *Typha angustifolia*.

11.1.1. Altheo officinalis-Butometum umbellati (Peinado & Esteves 1982) Rivas-Martínez & Peinado in Itinera Geobot. 18(1): 183, 2011

11.1.2. *Typho angustifoliae-Phragmitetum australis* (Tüxen & Preising 1942) Rivas-Martínez, Báscones, T.E. Díaz, Fernández-González & Loidi 1991

11.1.3. *Typho-Schoenoplectetum tabernaemontani* Br.-Bl. & O. Bolòs 1958 nom. mut. [*Typho-Schoenoplectetum glauci* Br.-Bl. & O. Bolòs 1958]

11.1b. Bolboschoenion maritimi Rivas-Martínez in Rivas-Martínez, Costa, Castroviejo & Valdés-Bermejo 1980 nom. mut. [*Scirpenion maritimi* Rivas-Martínez in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980]

Medium to tall graminoid rush-like communities resistant to long desiccation periods.

Typus: Phragmito australis-Bolboschoenetum maritimi (Tüxen 1937) Rivas-Martínez in Itinera Geobot. 18(1): 183, 2011 (11.1.4.).

Characteristic species: *Bolboschoenus maritimus* var. *maritimus*.

11.1.4. *Phragmito australis-Bolboschoenetum maritimi* (Tüxen 1937) Rivas-Martínez in Itinera Geobot. 18(1): 183, 2011 [*Scirpetum maritimi* Christiansen ex Tüxen 1937 non Egger 1931]

11b. NASTURTIO-GLYCERIETALIA Pignatti 1953

Pioneer short rhizomatous herbs and graminoids communities of fresh water streams and pools with variable water level.

Typus: Glycerio fluitantis-Sparganion neglecti Br.-Bl. & Sissingh in Boer 1942 (11.2.).

Characteristic species: *Alisma lanceolatum*.

11.2. Glycerio fluitantis-Sparganion neglecti Br.-Bl. & Sissingh in Boer 1942

Helophyte associations of eutrophic environments, occurring in low to medium kinetic energy water (stagnant water or weak current). Related to deep water-level fluctuations, and generally emerged during the summer period (although with strong soil moisture). European and North African distribution.

Typus: Glycerio fluitantis-Sparganietum neglecti Koch 1926.

Characteristic species: *Antinoria agrostidea* var. *Agrostidea*, *Eleocharis palustris* subsp. *palustris*, *Myosotis caespitosa*, *Oenanthe globulosa*, *Ranunculus ophio-glossifolius*, *Sparganium erectum* subsp. *neglectum*.

11.2a. Glycerio fluitantis-Sparganienion neglecti (Br.-Bl. & Sissingh in Boer 1942) J.A. Molina 1996

Deep water level communities, with only occasional desiccation.

Typus: Glycerio fluitantis-Sparganietum neglecti Koch 1926.

Characteristic species: *Sparganium erectum* subsp. *microcarpum*.

11.2.1. *Alismato plantaginis-aquaticae-Sparganietum microcarpi* J.A. Molina 1996

11.2.2. *Rorippo microphyllae-Sparganietum erecti* J.A. Molina 1996

11.2b. Glycerienion fluitantis (Géhu & Géhu-Franck 1987) J.A. Molina 1996

Communities from pools and slow flowing shallow waters with desiccation periods.

Typus: Glycerietum fluitantis Wizek 1935.

Characteristic species: *Glyceria declinata*, *Glyceria spicata*.

11.2.3. *Caro verticillati-Glycerietum fluitantis* J.A. Molina 1996

11.2.4. *Glycerio declinatae-Eleocharitetum palustris* Rivas-Martínez & Costa in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980 [*Glycerio declinatae-Antinorietum agrostideae* Rivas Goday 1964 corr. J.A. Molina 1996]

11.2c. Phalaridenion arundinaceae (Kopecki 1961) J.A. Molina 1996

Communities of streams with long periods of runoff.

Typus: Phalaridetum arundinaceae Libbert 1931.

Characteristic species: *Oenanthe crocata*, *Phalaris arundinacea*.

11.2.5. *Glycerio declinatae-Oenanthetum crocatae* Rivas-Martínez, Belmonte, Fernández-González & Sánchez-Mata in Sánchez-Mata 1989

11.2.6. *Oenanthe crocatae-Phalaridetum arundinaceae* J.A. Molina 1996

11.3. Rorippion nasturtii-aquatici Géhu & Géhu-Franck 1987 nom. mut.

[*Nasturtion officinalis* Géhu & Géhu-Franck 1987]

Prostrate communities of nutrient-rich waters.

Typus: Helosciadietum nodiflori Maire 1924 (11.3.3.). Characteristic species: *Apium nodiflorum*, *Apium repens*, *Berula erecta*, *Rorippa nasturtium-aquaticum*, *Veronica beccabunga*, *Veronica catenata*.

11.3.1. *Glycerio declinatae-Apietum nodiflori* J.A. Molina 1996

11.3.2. *Glycerio declinatae-Apietum repentis* J.A. Molina 1996

11.3.3. *Helosciadietum nodiflori* Maire 1924

11.3.4. *Rumicetum azoricae* Lüpnitz 1976

11c. MAGNOCARICETALIA Pignatti 1954

Tall sedge (*Cyperaceae*) communities of freshwaters.

Typus: Magnocaricion elatae Koch 1926 (11.4.).

Characteristic species: *Cladium mariscus*, *Galium elongatum*, *Galium palustre*.

11.4. Magnocaricion elatae Koch 1926

Swamp, lake and riverside communities on mesotrophic peaty soils. Eurosiberian and Mediterranean distribution.

Typus: Caricetum elatae Koch 1926.

Characteristic species: *Althea officinalis*, *Carex acuta*, *Carex elata* subsp. *elata*, *Carex hispida*, *Carex riparia*, *Cyperus longus* subsp. *longus*, *Gratiola officinalis*, *Polygonum salicifolium*.

11.4.1. *Cladietum marisci* Zobrist 1935

11.4.2. *Irido-Polygonetum salicifolii* O. Bolòs 1957

11.5. *Caricion reuterianae* (Rivas-Martínez, Fernández-González & Sánchez-Mata) J.A. Molina 1996 nom. mut.

[*Caricion broterianae* (Rivas-Martínez, Fernández-González & Sánchez-Mata) J.A. Molina 1996]

Riverine Mediterranean West Iberian communities, on meso-oligotrophic soils.

Typus: *Galio broteriani-Caricetum reuterianae* Rivas-Martínez ex V. Fuente 1986 nom. mut. (11.5.2.).

Characteristic species: *Carex paniculata* subsp. *lusitanica*, *Carex elata* subsp. *reuteriana*, *Carex elata* subsp. *tartesiana*, *Galium broterianum*, *Holcus reuteri*.

11.5.1. *Caricetum pseudocypero-lusitanicae* Rivas-Martínez & Costa in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980 (fig.1, page 103)

11.5.2. *Galio broteriani-Caricetum reuterianae* Rivas-Martínez ex V. Fuente 1986 nom. mut. [*Galio broteriani-Caricetum broterianae* Rivas-Martínez ex V. Fuente 1986]

11.5.3. *Galio palustris-Caricetum lusitanicae* Rivas-Martínez, Belmonte & Sánchez-Mata in Sánchez-Mata 1989

11.5.4. *Irido pseudacori-Caricetum lusitanicae* Bellot ex T.E. Díaz & F. Prieto 1994

11.6. *Deschampsion argenteae* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000

Madeiran communities of waterfalls and walls with slow dripping or laminar water.

Typus: *Deschampsietum argenteae* Sjögren ex Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 (11.6.1.).

Characteristic species: *Asterella africana*, *Deschampsia argentea*, *Oenanthe divaricata*, *Peucedanum lowei*.

11.6.1. *Deschampsietum argenteae* Sjögren ex Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000

11.6.2. *Peucedano lowei-Oenanthetum divaricatae* Foucault 2000

11d. *BOLBOSCHOENETALIA COMPACTI* Dahl & Hadač 1941 corr. Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980 nom. mut.

[*Scirpetalia compacti* Dahl & Hadač 1941 corr. Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980]

Holarctic communities of sedges and graminoids in brackish water.

Typus: *Bolboschoenion compacti* Dahl & Hadač 1941 corr. Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980 nom. mut. (11.7.).

Characteristic species: *Bolboschoenus maritimus* var. *compactus*.

11.7. *Bolboschoenion compacti* Dahl & Hadač 1941 corr. Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980 nom. mut.

[*Scirpion compacti* Dahl & Hadač 1941 corr. Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980]

Eurosiberian and Mediterranean saltwater communities.

Typus: *Bolboschoenetum compacti* Van Langendock 1931 corr. Bueno & F. Prieto in Bueno 1997 nom. mut. (11.7.1.).

Characteristic species: *Schoenoplectus litoralis*.

11.7.1. *Bolboschoenetum compacti* Van Langendock 1931 corr. Bueno & F. Prieto in Bueno 1997 nom. mut. (fig. 3, page 103)

[*Scirpetum compacti* Van Langendock 1931 corr. Bueno & F. Prieto in Bueno 1997]

11.7.2. *Bolboschoeno compacti-Phragmitetum australis* Bueno & F. Prieto in Bueno 1997 nom. mut.

[*Scirpo compacti-Phragmitetum australis* Bueno & F. Prieto in Bueno 1997]

11.7.3. *Bolboschoeno compacti-Scirpetum litoralis* (Br.-Bl. in Br.-Bl., Roussine & Nègre 1952) O. Bolòs 1962 nom. mut.

[*Scirpetum compacto-litoralis* (Br.-Bl. in Br.-Bl., Roussine & Nègre 1952) O. Bolòs 1962 corr. Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980]

11.7.4. *Bolboschoeno compacti-Scirpetum tabernaemontani* Bueno & F. Prieto in Bueno 1997 nom. mut.

[*Scirpetum compacto-tabernaemontani* Bueno & F. Prieto in Bueno 1997]

11.7.5. *Scirpetum pungentis* (Corillion 1950) Vanden Berghen 1967

12. *OXYCOCCO-SPHAGNETEA* Br.-Bl. & Tüxen ex Westhoff, Dijk & Passchier 1946

Ombrogenous or aquatic communities of blanket bogs, with peat dominated by *Sphagnum* spp. and heath, and a water level higher in the centre than in the margins. Dominated by mosses, several small sedges and *Ericaceae* forming dystrophic hydromorphic organic soils. Cosmopolitan distribution, except in warm tropical and Mediterranean areas.

Typus: *Sphagnetalia magellanici* Käster & Flössner 1933. Characteristic species: *Drosera rotundifolia*, *Sphagnum centrale*, *Sphagnum papillosum*.

12a. *SPHAGNO PAPILLOSI-ERICETALIA TETRALICIS* Schwickerath 1941 nom. inv.

[*Erico tetralicis-Sphagnetalia papillosi* Schwickerath 1941]

Communities of Atlantic raised and transitional bogs, very acidic, hyperoceanic and euoceanic, mostly ombrotrophic, subject to annual fluctuations of flooding. Distribution: Atlantic-European with subatlantic and Mediterranean West Iberian disjunctions, in temperate to lower orotemperate humid to hyperhumid bioclimate.

Typus: *Ericion tetralicis* Schwickerath 1933 (12.1.).

Characteristic species: *Aulacomnium palustre*, *Cephalozia connivens*, *Erica tetralix*, *Gymnocolea inflata*, *Sphagnum angustifolium*, *Sphagnum capillifolium*, *Sphagnum compactum*, *Sphagnum molle*, *Sphagnum rubellum*, *Sphagnum russowii*, *Sphagnum subnitens*, *Sphagnum subsecundum* var. *subsecundum*, *Sphagnum tenellum*.

12.1. *Ericion tetralicis* Schwickerath 1933

European-Atlantic and subatlantic oceanic communities in cold climate, subject to annual fluctuations in flooding. Occurrence in wet heathlands where thick peat leads to increased dryness, due to the remoteness of the groundwater table, although may be covered by water during the winter. This vegetation stands for advanced stages of succession of Atlantic peatlands, therefore being transitional to the hygrophyte heathlands.

Typus: Ericetum tetralicis Allorge ex Jonas 1932.

12.1a. *Ericenion tetralicis*

Transition acid bogs with thickets of *Erica tetralix* and *Calluna vulgaris* installed in a moss layer of *Sphagnum* spp. Distribution: European-Atlantic, subatlantic, Pyrenean and Mediterranean West Iberian, in meso-supratemperate, humid to hyperhumid bioclimate.

Typus: Ericetum tetralicis Allorge ex Jonas 1932.

12.1.1. *Erico tetralicis-Sphagnetum capillifolii* Tourf-fet 1969 em. M. Herrera 1995

12.1.2. *Tetralico-Narthebietum ossifragi* Br.-Bl. 1967

12.1b. *Trichophorenion germanici* Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas 1984

Bogs with continuous heath cover on fossil peats, subjected to a drying season at least in the upper soil horizons. Distribution Orocantabrian, Carpetan and European-Atlantic, in meso-orotemperate hyperhumid to ultrahyperhumid bioclimate.

Typus: Erico tetralicis-Trichophoretum germanici Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas 1984 (12.1.4.).

Characteristic species: *Narthecium ossifragum*, *Trichophorum caespitosum* subsp. *germanicum*.

12.1.3. *Calluno vulgaris-Sphagnetum capillifolii* F. Prieto, M.C. Fernández & Collado 1987

12.1.4. *Erico tetralicis-Trichophoretum germanici* Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas 1984

12.1.5. *Junco squarrosi-Sphagnetum compacti* Br.-Bl., P. Silva, Rozeira & Fontes 1952

12.1.6. *Nartheccio ossifragi-Sphagnetum tenelli* F. Prieto, M.C. Fernández & Collado 1987

13. *SCHEUCHZERIO PALUSTRIS-CARICETEA NIGRAE* Tüxen 1937 nom. mut.

[*Scheuchzerio-Caricetea fuscae* Tüxen 1937]

Mire, fen and bog communities of small sedges and bryophytes of Holarctic cold territories. Communities colonizing peaty or mineral oligotrophic to mesotrophic soils.

Typus: Caricetalia nigrae Koch 1926 em. Br.-Bl. 1948 nom. mut.

Characteristic species: *Carex lepidocarpa*, *Carex nigra*, *Menyanthes trifoliata*, *Parnassia palustris*, *Pedicularis palustris* subsp. *palustris*, *Pinguicula vulgaris*, *Salix repens*, *Spiranthes aestivalis*, *Sphagnum inundatum*, *Sphagnum platyphyllum*, *Warnstorfia exammulata*.

13a. *SCHEUCHZERIETALIA PALUSTRIS* Nordhagen 1936

Pioneer moss communities in oligo-dystrophic peats, which colonize ponds and soil depressions.

Typus: Scheuchzerion palustris Nordhagen ex Tüxen 1937.

13.1. *Rhynchosporion albae* Koch 1926

Single alliance in Iberian Peninsula.

Typus: Rhynchosporium albae Koch 1926.

Characteristic species: *Drosera intermedia*, *Lycopodiella inundata*, *Rhynchospora alba*, *Sphagnum cuspidatum*.

13.1.1. *Eleocharito multicaulis-Rhynchosporium albae* C. Valle & F. Navarro ex Rivas-Martínez 2002

13b. *CARICETALIA NIGRAE* Koch 1926 em. Br.-Bl. 1948 nom. mut.

[*Caricetalia fuscae* Koch 1926]

Communities of Holarctic oligotrophic peats and mineral peaty soils.

Typus: Caricion nigrae Koch 1926 em. Klika 1934 nom. mut. (13.2.).

Characteristic species: *Agrostis canina* subsp. *canina*, *Carex echinata*, *Epilobium palustre*, *Eriophorum angustifolium*, *Sphagnum flexuosum*, *Viola palustris* subsp. *palustris*.

13.2. *Caricion nigrae* Koch 1926 em. Klika 1934

nom. mut.

[*Caricion fuscae* Koch 1926]

Mires of high mountains, boreal and alpine, above the orotemperate belt, although they can occur sometimes in the oro-submediterranean Iberian Central System.

Typus: Caricetum (goodenowii) nigrae Br.-Bl. 1915 nom. mut.

Characteristic species: *Carex demissa*, *Viola palustris* subsp. *juressi*.

13.2.1. *Caricetum echinato-nigrae* (Rivas-Martínez 1964) 2002 (fig.4, page 103)

[*Caricetum carpetanae* Rivas-Martínez 1963]

13.3. *Anagallido tenellae-Juncion bulbosi* Br.-Bl. 1967

Atlantic pioneer communities of oligotrophic flat bogs with poor drainage, in thermo-mesotemperate, oceanic and rainy bioclimate. Cantabrian-Atlantic and Saden-sean-Dividing Portuguese distribution.

Typus: Anagallido tenellae-Juncetum bulbosi Br.-Bl. 1967 (13.3.1.).

Characteristic species: *Agrostis hesperica*, *Anagallis tenella*, *Arnica montana* subsp. *atlantica*, *Carex trinervis*, *Carex viridula* subsp. *cedercreutzii*, *Pinguicula lusitanica*, *Scutellaria minor*, *Wahlenbergia hederacea*.

13.3.1. *Anagallido tenellae-Juncetum bulbosi* Br.-Bl. 1967

13.3.2. *Arnicetum atlanticae* Bellot 1968

13.3.3. *Eleocharito multicaulis-Caricetum cedercreutzii* F. Prieto & Aguiar in F. Prieto, Aguiar & Dias in Int. J. Geobot. Res. 2: 111. 2012

13.3.4. *Sibthorpio europaea-Pinguiculetum lusitanicae* Ladero & A. Velasco in A. Veslaco 1980

14. UTRICULARIETEA INTERMEDIO-MINORIS Pietsch 1965
Holarctic dystrophic and oligotrophic floating *Utricularia* communities, growing in small boggy pools in meso- to orotemperate oceanic bioclimate.

Typus: Utricularietalia intermedio-minoris Pietsch 1965 (14a.).

14a. UTRICULARIETALIA INTERMEDIO-MINORIS Pietsch 1965
Single order in Portugal.

Typus: Sphagno-Utricularion Müller & Görs 1960 (14.1.).

14.1. Sphagno-Utricularion Müller & Görs 1960

Single alliance in Portugal.

Typus: Sphagno minoris-Utricularietum intermediae Br.-Bl. 1937.

Characteristic species: *Sphagnum auriculatum*.

14.1.1. *Utriculario exoletae-Sphagnetum auriculati*
Neto, Capelo, J.C. Costa & Lousã 1996 (fig. 5, page 104)

III. COASTAL HALOPHILOUS AND SAND DUNE VEGETATION

IIIa. VEGETATION OF COASTAL DUNES

15. EUPHORBIO PARALIAE-AMMOPHILETEA ARUNDINACEAE Géhu & Rivas-Martínez in *Itinera Geobot.* 18(1): 191-192, 2011 nom. mut.

[*Ammophiletea arenariae* sensu auct. non Br.-Bl. & Tüxen ex Westhoff, Dijk & Passchier 1946; *Euphorbio paraliae-Ammophiletea australis* Géhu & Rivas-Martínez in *Itinera Geobot.* 18(1): 191-192, 2011]

Pioneer perennial rhizomatous grass and chamaephyte coastal dune vegetation of the Mediterranean and the Atlantic coasts. Colonizes biotopes characterized by constant wind action, moderate salinity of the soil and air, mobility of sands and oligotrophic substrate.

Typus: Ammophiletalia arundinaceae Br.-Bl. 1933 (15a).
Characteristic species: *Anthemis maritima*, *Cyperus capitatus*, *Euphorbia paralias*, *Euphorbia portlandica*, *Lotus creticus*, *Medicago marina*, *Pancratium maritimum*, *Polygonum maritimum*.

15a. AMMOPHILETALIA ARUNDINACEAE Br.-Bl. 1933

Mobile fore-dune (with dunes) vegetation (internal high coastal dunes).

Typus: Ammophilion arundinaceae Br.-Bl. 1921 (15.1.).

Characteristic species: *Calystegia soldanella*, *Eryngium maritimum*, *Otanthus maritimus*.

15.1. Ammophilion arundinaceae Br.-Bl. 1921

Communities of mobile dunes dominated by *Ammophila arenaria* subsp. *arundinacea* (sand-fixing species). Colonizers of western Atlantic coasts of Europe and North Africa (to Cape Mogador, Morocco) and Mediterranean.

Typus: Medicagini marinae-Ammophiletum arundinaceae Br.-Bl. 1921.

15.1a. Ammophilenion arundinaceae Rivas-Martínez, T.E. Díaz, Fernández-González, Izco, Loidi, Lousã & Penas 2002 num. mut. prop.

[*Ammophilenion australis* Rivas-Martínez, T.E. Díaz, Fernández-González, Izco, Loidi, Lousã & Penas 2002]

Mediterranean and Cantabrian distribution, reaching the coasts of the Basque Country.

Typus: Loto cretici-Ammophiletum arundinaceae Rivas-Martínez 1965 corr. Rivas-Martínez, T.E. Díaz, Fernández-González, Izco, Loidi, Lousã & Penas 2002 nom. mut. (15.1.1.)

Characteristic species: *Ammophila arenaria* subsp. *arundinacea*.

15.1.1. *Loto cretici-Ammophiletum arundinaceae* Rivas-Martínez 1965 corr. Rivas-Martínez, T.E. Díaz, Fernández-González, Izco, Loidi, Lousã & Penas 2002 nom. mut. prop. (fig 6)
[*Loto cretici-Ammophiletum australis* Rivas-Martínez 1965 corr. Rivas-Martínez, T.E. Díaz, Fernández-González, Izco, Loidi, Lousã & Penas 2002]

15.1.2. *Otantho maritimi-Ammophiletum arundinaceae* Géhu & Tüxen 1975 (fig. 7, page 104)
[*Agropyro junceiformis-Otanthetum ammophiletosum arenariae* Br.-Bl., Rozeira & P. Silva in J. & G. Br.-Bl., Rozeira & P. Silva 1972]

15.2. Honckenyo peplodis-Elytrigion boreoatlanticae Tüxen in Br.-Bl. & Tüxen 1952 nom. invers. et nom. mut.

[*Agropyro-Minuartion peplodis* Tüxen in Br.-Bl. & Tüxen 1952 (art. 45); *Agropyron junceiformis* Géhu, Rivas-Martínez & Tüxen ex Loriente 1978 (art. 29a)]

Pioneer communities of the embryonic dunes of the Atlantic and Mediterranean beaches (external flat coastal dunes). Subject to the mechanical action of the waves during high tides and storms, the constant mobility of sands and a high salinity of the substrate and air.

Typus: Euphorbio paraliae-Elytrigietum boreoatlanticae Tüxen in Br.-Bl. & Tüxen 1952 nom. mut. (15.2.1.).

Characteristic species: *Elytrigia juncea* subsp. *juncea* (dif. al.).

15.2a. Honckenyo peplodis-Elytrigienion boreoatlanticae (Tüxen in Br.-Bl. & Tüxen 1952) Rivas-Martínez in *Itinera Geobot.* 18(2): 448, 2011

[*Agropyrenion junceiformis* (Géhu, Rivas-Martínez & Tüxen ex Loriente 1978) Rivas-Martínez, Costa Castroviejo & E. Valdés 1980 (art. 5,8)]

Vegetation of the Atlantic beaches from the Baltic to western coasts of northern Morocco.

Typus: Euphorbio paraliae-Elytrigietum boreoatlanticae Tüxen in Br.-Bl. & Tüxen 1952 nom. mut. (15.2.1.).

Characteristic species: *Elytrigia juncea* subsp. *boreoatlantica*, *Elytrigia juncea* subsp. *juncea* (ter.), *Honckenya peplodes*.

15.2.1. *Euphorbio paraliae-Elytrigietum boreoatlanticae* Tüxen in Br.-Bl. & Tüxen 1952 nom. mut. (fig.7, page 104)

[*Euphorbio paraliae-Agropyretum juncei* Tüxen in Br.-Bl. & Tüxen 1952; *Eryngio maritimae-Honckenyetum peplodis* Br.-Bl., Rozeira & P. Silva in J. & G. Br.-Bl., Rozeira & P. Silva 1972 (syntax. syn.), *Agropyro junceiformis-Otanthetum agropyro-crucianelletosum* Br.-Bl., Rozeira & P. Silva in J. & G. Br.-Bl., Rozeira & P. Silva 1972]

15.2.2. *Elytrigietum junceo-boreoatlanticae* J.C. Costa, Neto, Lousã, Capelo & Rivas-Martínez in Silva Lusit. 13 (1): 136-137, 2005 (fig. 6, page 104)

15.3. *Sporobolion arenarii* (Géhu & Géhu-Franck ex Géhu & Biondi 1994) Rivas-Martínez & Cantó 2002

Mediterranean communities dominated by *Sporobolus arenarius* that develop in coastal dunes slightly mobile, and sometimes changed in dune depressions that are inundated by salt water during spring tides and storms.

Typus: Eryngio maritimae-Sporoboletum arenarii Rivas-Martínez & Cantó 2002.

Characteristic species: *Centaurea sphaerocephala* var. *polyacantha*, *Sporobolus arenarius*.

15.3.1. *Sporoboletum arenarii* Rothmaler 1943 (fig. 8, page 104)

15b. *CRUCIANELLETALIA MARITIMAE* Sissingh 1974

Coastal dune communities composed of by chamaephytes (grey hind-dunes). Distribution Mediterranean, Galician-Portuguese, Cantabrian-Basque and Aquitanian.

Typus: Crucianellion maritimae Rivas Goday & Rivas-Martínez 1958.

Characteristic species: *Aetheorhiza bulbosa* subsp. *bulbosa*, *Crucianella maritima*, *Leontodon taraxacoides* subsp. *taraxacoides*, *Malcolmia littorea*, *Matthiola sinuata*, *Ononis ramosissima*, *Scrophularia frutescens*, *Seseli tortuosum*.

15.4. *Helichryson picardii* (Rivas-Martínez, Costa & Izco in Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990) ex Rivas-Martínez, Fernández-González & Loidi 1999

[*Helichrysenion picardii* Rivas-Martínez, Costa & Izco in Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990; *Linario-Vulpion alopecuroidis* Br.-Bl., Rozeira & P. Silva in J. & G. Br.-Bl., Rozeira & P. Silva 1972 p.p. (art. 37)]

Cantabrian-Basque, Galician-Portuguese and Coastal Lusitanian-Andalusian dune communities.

Typus: Artemisio crithmifoliae-Armerietum pungentis Rivas Goday & Rivas-Martínez 1958 (15.4.2.).

Characteristic species: *Armeria pungens*, *Armeria welwitschii* subsp. *welwitschii*, *Artemisia crithmifolia*, *Coincya johnstonii*, *Euphorbia boetica*, *Helichrysum picardii*, *Iberis procumbens*, *Jasione lusitanica*, *Linaria lamarckii*, *Linaria polygalifolia*, *Thymus carnosus*.

15.4.1. *Armerio welwitschii-Crucianelletum maritimae* J. & G. Br.-Bl., Rozeira & P. Silva 1972

15.4.2. *Artemisio crithmifoliae-Armerietum pungentis* Rivas Goday & Rivas-Martínez 1958 (fig.9, page 104)

15.4.3. *Iberidetum procumbentis* Bellot 1996

16. *CAKILETEA MARITIMAE* Tüxen & Preising in Tüxen 1950

Pioneer halo-nitrophilous annual forb communities of strandlines, beaches and coastal sand dunes. Often colonizers of the sandy beaches in the area of high accumulation of organic debris transported by sea. Distribution Holarctic.

Typus: Cakiletalia integrifoliae Tüxen ex Oberdorfer 1950 corr. Rivas-Martínez, Costa & Loidi 1992 (16a.). Characteristic species: *Atriplex prostrata* (dif.), *Beta maritima* var. *maritima*, *Cakile edentula*, *Chamaesyce peplis*, *Glaucium flavum*, *Salsola kali* subsp. *kali*.

16a. *CAKILETALIA INTEGRIFOLIAE* Tüxen ex Oberdorfer 1950 corr. Rivas-Martínez, Costa & Loidi 1992

Communities of nitrogen-rich environments on the Baltic, European Atlantic and North African coasts.

Typus: Atriplicion littoralis Nordhagen 1940 (16.1.).

16.1. *Atriplicion littoralis* Nordhagen 1940

[*Salsolo kali-Minuartion peplidis* Tüxen 1950]

Communities of European Atlantic beaches, at north of Cape Carvoeiro (Peniche).

Typus: Atriplicetum littoralis Feekes 1936 em. Westhoff & Beeftink 1950.

Characteristic species: *Cakile maritima* subsp. *integrifolia*.

16.1.1. *Honckenyo-Euphorbietum peplis* Tüxen ex Géhu 1964

16.2. *Cakilion maritimae* Pignatti 1953

[*Euphorbion peplis* Tüxen 1950 (art. 8)]

Mediterranean communities that colonize the beaches to the of Cape Carvoeiro.

Typus: Xanthio italici-Cakiletum maritimae.

Characteristic species: *Cakile maritima* subsp. *maritima*.

16.2.1. *Salsolo kali-Cakiletum maritimae* Costa & Mansanet 1981 nom. mut.

[*Salsolo kali-Cakiletum aegyptiacae* Costa & Mansanet 1981]

IIIb. COASTAL HALOPHILOUS VEGETATION

17. *CRITHMO MARITIMI-LIMONIETEA* Br.-Bl. in Br.-Bl., Roussine & Nègre 1952 nom. mut.

[*Crithmo-Staticetea* Br.-Bl. in Br.-Bl., Roussine & Nègre 1952]

Chasmophytic vegetation of sea-cliff's leptosols, consisting of geophytes, hemicryptophytes and chamaephytes, usually succulent, splashed by marine salt spray, subject to strong edaphic dryness and a permanent influence of sea winds laden with salt. Mediterranean and European Atlantic distribution.

Typus: Crithmo maritimi-Limonietalia Molinier 1934 nom. mut. (17a.).

Characteristic species: *Asteriscus maritimus*, *Crithmum maritimum*, *Limonium virgatum*, *Plantago macrorhiza*.

17a. *CRITHMO MARITIMI-LIMONIETALIA* Molinier 1934 nom. mut.

[*Crithmo-Staticetalia* Molinier 1934]

Communities of Mediterranean sea cliffs.

Typus: Crithmo maritimi-Limonion pseudominuti Molinier 1934 nom. mut.

17.1. *Crithmo maritimi-Daucion halophili* Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990

Thermomediterranean communities of Coastal Lusitanian-Andalusian sea cliffs.

Typus: Limonietum emarginati Asensi 1984.

Characteristic species: *Armeria pseudarmeria*, *Armeria welwitschii* subsp. *cinerea*, *Armeria pungens* subsp. *major*, *Carlina corymbosa* var. *major*, *Daucus halophilus*, *Dianthus cintranus*, *Dittrichia maritima*, *Helichrysum decumbens*, *Limonium laxiusculum*, *Limonium multiflorum*, *Limonium nydeggeri*, *Limonium plurisquamatum*, *Plantago almogravensis*, *Plantago coronopus* subsp. *occidentalis*, *Silene obtusifolia*, *Spergularia australis*.

17.1.1. *Dactylo marinae-Armerietum majoris* Neto, Capelo, Caraça & J.C. Costa 2001

17.1.2. *Dactylo marinae-Limonietum plurisquamati* J.C. Costa, Capelo, Lousã & Espírito Santo 1998

17.1.3. *Diantho cintrani-Daucetum halophili* J.C. Costa, Capelo, Lousã & Espírito Santo 1998

17.1.4. *Dittrichietum maritimi* J.C. Costa, Arsénio & Neto in Neto, Arsénio & J.C. Costa in *Quercetea* 9: 88, 2009 (fig. 10, page 104)

17.1.5. *Helianthemo stoechadifolii-Limonietum virgati* J.C. Costa, Lousã & Capelo in Aguiar, J.C. Costa, Capelo, Amado, Honrado, Espírito Santo & Lousã in *Silva Lusit.* 11 (1): 109, 2003

17.1.6. *Limonietum multifloro-virgati* J.C. Costa, Capelo, Lousã & Espírito Santo 1998 (fig. 11, page 105)

17.1.7. *Myriolimetum ferulacei* Rothmaler 1943 nom. mut.

[bas. *Limonietum ferulacei* Rothmaler 1943; *Crithmo-Limonietum lanceolati* Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990; *Crithmo maritimae-Limonietum ovalifolli* Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990 nom. mut. nom. inval. (art. 31)]

17.1.8. *Spergulario rupicolae-Limonietum virgatae* Neto, J.C. Costa, Capelo, Caraça & M.D. Pereira in *Silva Lusit.* 13 (1): 134, 2005

17.1.9. Community of *Plantago almogravensis*

17.2. *Astragalion tragacanthae* (Folch ex Rivas-Martínez, Fernández-González & Loidi 1999) Rivas-Martínez, Fernández-González & Loidi 2002 [*Crithmo-Helichryson* Rothmaler 1943 nom. inval. (art. 3f); *Astragalenion massiliensis* Folch ex Rivas-Martínez, Fernández-González & Loidi 1999]

Rocky and feebly aerohaline coastal communities, thermomediterranean semi-arid to dry of Catalan-Provençal and Vincentine Promontory distribution.

Typus: *Senecioni cinereae-Astragaletum tragacanthae* O. Bolòs & Vigo 1984 nom. mut.

Characteristic species: *Astragalus tragacantha* subsp. *vicentinus*, *Silene rothmaleri*.

17.2.1. *Dauco halophili-Astragaletum vicentini* (Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990) Rivas-Martínez, Fernández-González & Loidi 2002 (fig. 12, page 105)

[*Astragaletum vicentini* Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990 nom. inval. (art. 31, 39); *Astragaletum vicentinum* Rothmaler 1943 p.p. nom. inval. (art. 37)]

17.3. *Frankenio-Astydamion latifoliae* Santos 1976

Sea cliff communities of Canarias Islands that reach the Selvagens Islands.

Typus: *Frankenio-Astydamietum latifoliae* Lohmeyer & Trautmann 1970 (17.3.1.).

Characteristic species: *Astydamia latifolia*.

17.3.1. *Frankenio-Astydamietum latifoliae* Lohmeyer & Trautmann 1970

17.4. *Helichryson obconico-devium* Rivas-Martínez, Capelo, J.C. Costa, Lousã, Fontinha, Jardim & Sequeira 2002

Sea cliff communities of Madeira and Porto Santo.

Typus: *Crithmo maritimi-Helichrysetum obconici* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 (17.4.1.).

Characteristic species: *Frankenia laevis* var. *hebecaulon*, *Helichrysum devium*, *Helichrysum obconicum*, *Limonium lowei*, *Lotus loweanus*, *Sinapidendron frutescens*.

17.4.1. *Crithmo maritimi-Helichrysetum obconici* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000

17.4.2. *Lotetum loweani* Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito Santo & Lousã in *Silva Lusit.* 11 (1): 118, 2003

17.4.3. *Limonietum lowei* Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito Santo & Lousã corr. Capelo, J.C. Costa, Jardim & Sequeira hoc loco

[*Limonietum pyramidati* Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito Santo & Lousã in *Silva Lusit.* 11 (1): 118, 2003 nom. inval. (art.31)]

17b. *CRITHMO-ARMERIETALIA* Géhu 1968

Atlantic chasmophytic aerohaline pioneer communities of sea cliffs.

Typus: *Crithmo maritimi-Armerion maritimae* Géhu 1968 (17.5.).

17.5. *Crithmo maritimi-Armerion maritimae* ex Géhu & Géhu & Géhu -Frank 1984

British and Cantabrian-Atlantic associations, reaching Portugal in the Berlengas archipelago.

Typus: *Crithmo maritimi-Spergularietum rupicolae* (Roux & Lahondère 1960) Géhu 1964.

Characteristic species: *Angelica pachycarpa*, *Anthyllis vulneraria* subsp. *iberica*, *Armeria berlengensis*, *Armeria maritima* subsp. *miscella*, *Armeria pubigera*, *Dactylis marina*, *Daucus gummifer*, *Silene uniflora*, *Spergularia rupicola*, *Sesamoides suffruticosa* subsp. *latifolia*, *Trifolium occidentale*.

17.5.1. *Armerio miscellae-Festucetum littoralis* Rivas-Martínez 1978

17.5.2. *Crithmo maritimi-Armerietum pubigeriae* Rivas-Martínez 1978

17.5.3. *Dauco gummiferi-Festucetum pruinosa* Rivas-Martínez 1978

[sin. *Armerio pubigeriae-Festucetum pruinosa* Honrado & Nepomuceno in Honrado, P. Alves, Nepomuceno & B. Caldas in *Silva Lusit.* 10(2): 255-257, 2002]

17.5.4. *Spergulario rupicolae-Armerietum berlengensis* Capelo, J.C. Costa & Lousã in J.C. Costa, Capelo, Lousã & Espírito Santo 1998

17.6. *Euphorbio azoricae-Festucion petraeae* Lüpnitz 1976

Communities of the Azores sea cliffs.

Typus: Festucetum petraeae Lüpnitz 1976 (17.6.2.).

Characteristic species: *Azorina vidali*, *Daucus azoricus*, *Euphorbia azorica*, *Festuca petraea*, *Myosotis maritima*, *Solidago sempervirens* subsp. *azorica*, *Spergularia azorica*.

17.6.1. *Azorinetum vidalii* Lüpnitz 1976 nom. mut. (fig. 13, page 105 [Campanuletum vidalii Lüpnitz 1976])

17.6.2. *Festucetum petraeae* Lüpnitz 1976

17.6.3. *Festuco petraeae-Juncetum acuti* F. Prieto & Aguiar in F. Prieto, Aguiar & Dias in Int. J. Geobot. Res. 2: 112. 2012

17.6.4. *Spergularietum azoricae* Lüpnitz 1976

18. JUNCETEA MARITIMI Br.-Bl. in Br.-Bl., Roussine & Nègre 1952

Halophilic vegetation mostly consisting of grasses and rushes of sandy coasts, in estuaries and continental depressions on wet or inundated saltmarshes. Usually with lower tolerance to salinity than *Sarcocornietea fruticosae*. Atlantic and Mediterranean distribution.

Typus: Juncetalia maritimi Br.-Bl. in Br.-Bl., Roussine & Nègre 1952 (18a.).

Characteristic species: *Apium graveolens*, *Aster tripolium* subsp. *pannonicus*, *Carex extensa*, *Festuca pruinosa*, *Glaux maritima*, *Juncus maritimus*, *Limonium auriculatae-ursifolium*, *Plantago maritima*, *Puccinellia rupestris*, *Spergularia salina*, *Triglochin maritima*.

18a. JUNCETALIA MARITIMI Br.-Bl. in Br.-Bl., Roussine & Nègre 1952

Halophilic or subhalophilic grass and rush communities, in continental or Mediterranean coastal areas.

Typus: Juncion maritimi Br.-Bl. in Br.-Bl., Roussine & Nègre 1952 (18.1.).

Characteristic species: *Elytrigia elongata*, *Juncus acutus*, *Melilotus siculus*, *Puccinellia tenuifolia*, *Sonchus maritimus* subsp. *maritimus*, *Spartina versicolor*.

18.1. *Juncion maritimi* Br.-Bl. in Br.-Bl., Roussine & Nègre 1952

Rushes of halophilic or subhalophilic coastal meadows, with continental Western Mediterranean distribution.

Typus: Junco gerardii-Triglochinietum maritimi Br.-Bl. in Br.-Bl., Roussine & Nègre 1952.

Characteristic species: *Centaurium tenuiflorum*, *Juncus subulatus*.

18.1a. *Juncenion maritimi* (Br.-Bl. in Br.-Bl., Roussine & Nègre 1952) Rivas-Martínez 1984

Coastal rush euoceanic meadows.

Typus: Junco gerardii-Triglochinietum maritimi Br.-Bl. in Br.-Bl., Roussine & Nègre 1952.

Characteristic species: *Frankenia boissieri*, *Trifolium squamosum*.

18.1.1. *Cotulo coronopifoliae-Triglochinietum barrelieri* J.C. Costa, Neto, Arsénio & Capelo in Bot. Helv. 119: 56-57, 2009 (fig. 37, page 110)

18.1.2. *Polygono equisetiformis-Juncetum maritimi* J.C. Costa in J.C. Costa, Lousã & Espírito Santo 1997 (fig.14, page 105)

18b. GLAUCO-PUCCINELLIETALIA Beeftink & Westhoff in Beeftink 1962

Grass and rush halophilic or subhalophilic meadows, temperate, continental or coastal, Cantabrian-Atlantic and Central European distribution.

Typus: Puccinellion maritimae Christiansen in Führer 1927 nom. mut.

Characteristic species: *Armeria maritima*, *Limonium binervosum*, *Limonium vulgare*, *Puccinellia distans*, *Puccinellia maritima*.

18.2. *Armerion maritimae* Br.-Bl. & De Leew 1936 [Glaucio maritimae-Juncion maritimi Géhu & Géhu-Franck 1984]

Rushes coastal meadows, estuarine or sub-halophiles, Atlantic-European.

Typus: Festuco litoralis-Armerietum maritimae Br.-Bl. & De Leew 1936.

Characteristic species: *Carex punctata*, *Festuca rubra* subsp. *litoralis*.

18.2.1. *Agrostio stoloniferae-Juncetum maritimi* Izco, P. Guitián & J.M. Sánchez 1993

18.2.2. *Junco maritimi-Phragmitetum australis* Izco & J.M. Sánchez 1997

18.2.3. *Limonio-Juncetum maritimi* Teles ex Izco, P. Guitián & J. Mánchez 1993

18.2.4. *Puccinellio maritimae-Juncetum maritimi* Bueno & F. Prieto in Bueno 1997

18.3. *Limonio ovalifolii-Frankenion laevis* Arbesú, Bueno & F. Prieto 2002

Cantabrian-Atlantic halophilic communities, with rosette and prostrate chamaephytes, that colonize the upper zone of salt marshes reached by sea water only during the highest tides.

Typus: Crithmo maritimi-Frankenietum laevis Arbesú, Bueno & F. Prieto 2002.

Characteristic species: *Frankenia laevis*, *Limonium dodartii*, *Limonium ovalifolium*.

18.3.1. *Limonio binervosi-Frankenietum laevis* Izco & J.M. Sánchez 1997

18.3.2. *Puccinellio tenuifoliae-Limonietum plurisquamati* J.C. Costa, Neto & Portela-Pereira in J.C. Costa, Arsénio, Monteiro-Henriques, Portela-Pereira, T. Almeida & Izco 2009 corr. J.C. Costa & Caperta hoc loco (fig. 15, page 104) [Puccinellio tenuifoliae-Limonietum daveau J.C. Costa, Neto & Portela-Pereira in J.C. Costa, Arsénio, Monteiro-Henriques, Portela-Pereira, T. Almeida & Izco in J. of Coastal Res. SI 56: 1343, 2009]

19. SAGINETEA MARITIMAE Westhoff, Van Leeuwen & Adriani 1962

Annual halo-nitrophilous, pioneer and ephemeral vegetation, which supports flood over a period of time and in some places is subjected to strong sea salt-rich winds. Holarctic distribution.

Typus: Saginetalia maritimae Westhoff, Van Leeuwen & Adriani 1962 (19a.).

Characteristic species: *Bupleurum tenuissimum*, *Catapodium marinum*, *Centaureum spicatum*, *Parapholis incurva*, *Parapholis strigosa*, *Sagina maritima*, *Spergularia bocconei*, *Spergularia marina*.

19a. *SAGINETALIA MARITIMAE* Westhoff, Van Leeuwen & Adriani 1962

Atlantic, halophytic and weakly nitrophilous vegetation, in which are prevalent small biomass therophytes, that develop during the spring, in temporarily waterlogged or wet salty soils, or at least influenced by salt spray.

Typus: *Saginion maritimae* Westhoff, Van Leeuwen & Adriani 1962 (19.1.).

19.1. *Saginion maritimae* Westhoff, Van Leeuwen & Adriani 1962

The sole order found in Portugal.

Typus: *Sagino maritimae-Cochlearietum danicae* Tüxen & Gillner in Tüxen, Bockelmann, Rivas-Martínez & Wildpret 1957 (19.1.1.).

Characteristic species: *Cochlearia danica*, *Sagina nodosa*.

19.1.1. *Sagino maritimae-Cochlearietum danicae* Tüxen & Gillner in Tüxen, Bockelmann, Rivas-Martínez & Wildpret 1957

19b. *FRANKENIETALIA PULVERULENTAE* Rivas-Martínez ex Castroviejo & Porta 1976

Mediterranean littoral and inland halo-nitrophilous communities.

Typus: *Frankenion pulverulentae* Rivas-Martínez ex Castroviejo & Porta 1976 (19.2.).

Characteristic species: *Frankenia pulverulenta*, *Parapholis filiformis*.

19.2. *Frankenion pulverulentae* Rivas-Martínez ex Castroviejo & Porta 1976

Mediterranean associations formed by ephemeral therophytes and other small biomass plants that thrive in disturbed, coastal and inland biotopes, subjected to a long submersion period in salty water.

Typus: *Parapholido incurvae-Frankenietum pulverulentae* Rivas-Martínez ex Castroviejo & Porta 1976 (19.2.2.).

Characteristic species: *Catapodium rigidum* subsp. *spicatum*, *Hymenolobus procumbens*, *Sphenopus divaricatus*.

19.2.1. *Parapholido incurvae-Catapodietum marini* Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990

19.2.2. *Parapholido incurvae-Frankenietum pulverulentae* Rivas-Martínez ex Castroviejo & Porta 1976

19.3. *Hordeion marini* Ladero, F. Navarro, C.J. Valle, Marcos, Ruiz Téllez & M.T. Santos 1984

Graminoid vernal communities, submerged by salt water during a short period of time. These biotopes are nitrophilous as a result of human activity or grazing. Mediterranean distribution.

Typus: *Polypogono maritimi-Hordeetum marini* Cirujano 1981 (19.3.1.).

Characteristic species: *Agrostis nebulosa*, *Hainardia cylindrica*, *Hordeum marinum*, *Polypogon maritimus*.

19.3.1. *Polypogono maritimi-Hordeetum marini* Cirujano 1981

20. *SARCOCORNIETEA FRUTICOSAE* Br.-Bl. & Tüxen ex A. & O. Bolòs 1950 nom. mut.

[*Salicornietea fruticosae* Br.-Bl. & Tüxen ex A. & O. Bolòs 1950]

Coastal and inland Mediterranean and Cantabrian-Atlantic perennial salt marsh and salt pan communities. Usually occurring in moistly soils, strongly rich in sodium salts, and subject to flooding by salt or brackish waters. It can be found either in marine or continental areas.

Typus: *Sarcocornietalia fruticosae* Br.-Bl. 1933 nom. mut. (20a.).

Characteristic species: *Artemisia gallica* subsp. *gallica*, *Inula crithmoides*.

20a. *SARCOCORNIETALIA FRUTICOSAE* Br.-Bl. 1933 nom. mut.

[*Salicornietalia fruticosae* Br.-Bl. 1933]

Vegetation formed by small succulent shrubs, in moistly saline soils at least temporarily subject to flooding by salt or brackish water.

Typus: *Sarcocornion fruticosae* Br.-Bl. 1933 nom. mut. (20.1.)

Characteristic species: *Cistanche phelypaea*, *Halimione portulacoides*, *Triglochin bulbosa* subsp. *barrelieri*.

20.1. *Sarcocornion fruticosae* Br.-Bl. 1933 nom. mut.

[*Salicornion fruticosae* Br.-Bl. 1933]

Mediterranean and Cantabrian-Atlantic (to the South of England) associations of salt marshes, flooded during the tides, dominated by small succulent shrubs of the genus *Sarcocornia*.

Typus: *Limonio bellidifolii-Sarcocornietum fruticosae* Br.-Bl. 1933 nom. mut.

Characteristic species: *Sarcocornia fruticosa*.

20.1a. *Sarcocornienion fruticosae* Rivas-Martínez & Costa in Itinera Geobot. 18(1): 204, 2011

[*Arthrocnemion fruticosae* Rivas-Martínez & Costa 1984 [art.5]]

Communities in wet soils flooded by salty waters, where *Sarcocornia fruticosa* is dominant; Mediterranean and Cantabrian-Atlantic distribution, reaching the southern British Isles.

Typus: *Limonio bellidifolii-Sarcocornietum fruticosae* Br.-Bl. 1933 nom. mut.

20.1.1. *Cistancho phelypaeae-Sarcocornietum fruticosae* Géhu ex Géhu & Géhu-Franck 1977 nom. mut. (fig. 16, , page 105; fig. 20, page 106) [*Cistancho phelypaeae-Arthrocnemetum fruticosae* Géhu ex Géhu & Géhu-Franck 1977]

20.1.2. *Puccinellio maritimae-Sarcocornietum fruticosae* Géhu 1976 nom. mut.

[*Puccinellio maritimae-Salicornietum fruticosae* Géhu 1976]

20.1b. *Sarcocornienion perennis* Rivas-Martínez in Rivas-Martínez, Costa, Castroviejo & Valdés 1980 nom. mut.

[*Arthrocnemion perennis* Rivas-Martínez in Rivas-Martínez, Costa, Castroviejo & Valdés 1980]

Communities of estuaries and coastal marshes subjected to the daily flow of tides, in which dominates the rhizomatous scrub *Sarcocornia perennis* subsp. *perennis*. They occupy the lower saltmarsh and therefore have a prolonged submersion period. The distribution is Coastal Lusitanian-Andalusian and Cantabrian-Atlantic: from the South West of England to Morocco.

Typus: *Puccinellio maritimae-Sarcocornietum perennis* (Arènes 1933) Géhu 1976 num. mut. (20.1.5.).

Characteristic species: *Limonium vulgare* (dif. suball.), *Puccinellia iberica*, *Sarcocornia perennis*.

20.1.3. *Halimionetum portulacoidis* Kuhnoltz-Lodat 1926

20.1.4. *Puccinellio ibericae-Sarcocornietum perennis* J.C. Costa in J.C. Costa, Lousã & Espírito Santo 1997 corr. Rivas-Martínez, T.E. Díaz, Fernández-González, Izco, Loidi, Lousã & Penas 2002 & nom. invers fig. 16, , page 105; fig. 20, page 106)

[*Sarcocornia perennis-Puccinellietum convolutae* J.C. Costa in J.C. Costa, Lousã & Espírito Santo 1997]

20.1.5. *Puccinellio maritimae-Sarcocornietum perennis* (Arènes 1933) Géhu 1976 nom. mut.

[*Puccinellio maritimae-Arthrocnemetum perennis* (Arènes 1933) Géhu 1976]

20.2. *Arthrocnemion macrostachyi* Rivas-Martínez & Costa 1984 nom. mut.

[*Arthrocnemion glauci* Rivas-Martínez & Costa 1984]

Mediterranean and Galician-Portuguese communities, occurring in soils only occasionally flooded, which are highly saline due to the capillarity phenomena associated to a large dry periods. The alliance occupies a higher position than the previous ones, and is under the smallest time of submergence.

Typus: *Sphenopo divaricati-Arthrocnemetum macrostachyi* Br.-Bl. 1933 num. mut.

Characteristic species: *Arthrocnemum macrostachyum*, *Limonium algarvense*, *Myriolimon ferulaceum*.

20.2a. *Arthrocnemion macrostachyi* Rivas-Martínez & Costa (1984) in Itinera Geobot. 18(1): 205, 2011

Mediterranean communities, with their northern limit in the Tagus estuary.

Typus: *Sphenopo divaricati-Arthrocnemetum macrostachyi* Br.-Bl. 1933 num. mut.

20.2.1. *Inulo crithmoidis-Arthrocnemetum macrostachyi* Fontes ex Géhu & Géhu-Franck 1977 (fig. 17, page 106)

20.2.2. *Limonio vulgaris-Juncetum subulati* J.C. Costa, Neto, T. Almeida & Lousã in J.C. Costa, Arsénio, Monteiro-Henriques, E. Pereira, T. Almeida & Izco in J. of Coastal Res. SI 56: 1343, 2009

20.2b. *Sarcocornienion alpini* Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990

Communities dominated by *Sarcocornia alpini*, mainly of Mediterranean range, reaching the Galician-Portuguese sector. Only occasionally occurring in areas directly flooded by tidal waters.

Typus: *Halimiono portulacoidis-Sarcocornietum alpini* Rivas-Martínez & Costa 1984 (20.2.3.).

Characteristic species: *Sarcocornia alpini*.

20.2.3. *Halimiono portulacoidis-Sarcocornietum alpini* Rivas-Martínez & Costa 1984 (fig. 16, page 105)

20.2.4. *Triglochino maritimae-Sarcocornietum alpini* J.C. Costa, Neto & Izco in J.C. Costa, Arsénio, Monteiro-Henriques, E. Pereira, T. Almeida & Izco in J. of Coastal Res. SI 56: 1343, 2009 (fig.18, page 106)

20.3. *Suaedion verae* (Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990) Rivas-Martínez, Fernández-González & Loidi 1999

Associations of nitrogen-rich biotopes occupying the highest position of the coastal salt-influenced zone, which is only briefly inundated by salt water and where tidal organic debris is found. It may still be observed in cliffs splashed by salt water, slopes, walls of salt pans and disturbed salty soils.

Typus: *Cistancho phelypaeae-Suaedetum verae* Géhu & Géhu-Franck 1977 (20.3.1.)

Characteristic species: *Suaeda vera* subsp. *vera*.

20.3.1. *Cistancho phelypaeae-Suaedetum verae* Géhu & Géhu-Franck 1977 (fig. 17, page 106)

20.3.2. *Scrophulario sublyratae-Suaedetum verae* J.C. Costa, Capelo & Lousã 1997

20b. LIMONETALIA Br.-Bl. & O. Bolòs 1958

Littoral and inland communities temporary wet Mediterranean high saline *Limonium* and perennial grasses.

Typus: *Limonion confusi* (Br.-Bl. 1933) Rivas-Martínez & Costa 1984.

20.4. *Limoniastrion monopetali* Pignatti 1953

Coastal thermomediterranean communities from well-drained sandy substrata dominated by *Limoniastrum monopetalum*.

Typus: *Limonio densissimi-Limoniastrum monopetali* Br.-Bl. ex Pignatti 1953.

Characteristic species: *Limoniastrum monopetalum*.

20.4.1. *Polygono equisetiformis-Limoniastrum monopetali* Rivas-Martínez & Costa in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980

20.5. *Limonion algarvensi-lanceolati* J.C. Costa, Neto, Monteiro-Henriques, Arsénio, Portela-Pereira, Caperta & Izco all. nova hoc loco

Halophilous thermomediterranean Coastal Lusitanian-Andalusian communities, with rosulate and prostrate chamaephytes that colonize the upper tideland of salt marshes reached by the sea water only during the highest tides.

Typus: Limonietum lanceolati Arsénio, J.C. Costa & Neto in Neto, Arsénio & J.C. Costa in *Quercetea* 9: 96, 2009 (20.5.2.).

Characteristic species: *Limonium algarvense*, *Limonium daveaui*, *Limonium lanceolatum*, *Myriolimon diffusum*.

20.5.1. *Inulo crithmoidis-Myriolimon ferulacei* Rivas-Martínez & Costa in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980 nom. mut. prop.

[*Inulo crithmoidis-Limonietum ferulacei* Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980]

20.5.2. *Limonietum daveaui* J.C. Costa, Caperta & Neto ass. nova hoc loco

20.5.3. *Limonietum lanceolati* Arsénio, J.C. Costa & Neto in Neto, Arsénio & J.C. Costa in *Quercetea* 9: 96, 2009 (fig. 19, page 106)

20.5.4. *Myriolimo diffusi-Limonietum algarvensis* J.C. Costa, Neto & Caperta ass. nova hoc loco

21. SPARTINETEA MARITIMAE Tüxen in Beefink 1952

Vegetation of perennial halophytic grasses, which occupy the low-energy environments, protected from direct waves in estuaries and coastal lowlands. These are pioneer communities over marine or river/sea sediments more or less fine, subject to daily tidal influence, occupying the lower areas of the marsh in muddy platforms (slick). The immersion time is, in general, larger than in the remaining marsh ecosystems. Distribution in Atlantic coast: Europe, northwest Africa and Atlantic American.

Typus: Spartinetalia alterniflorae Conard 1935 (21a).

Characteristic species: *Spartina densiflora*.

21a. SPARTINETALIA ALTERNIFLORAE Conard 1935

[*Spartinetalia maritimae* sensu auct. europ. non Conrad]

Pioneer halophytic communities of the intertidal zone in Europe, Africa and North America.

Typus: Spartinion alterniflorae Conard 1935.

21.1. Spartinion maritimae Conard ex Beefink & Géhu 1973

European Atlantic and North African communities.

Typus: Spartinetum maritimae Béguinot ex Corillion 1953 (21.1.2.).

Characteristic species: *Spartina maritima*.

21.1.1. *Spartinetum densiflorae* Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980

21.1.2. *Spartinetum maritimae* Béguinot ex Corillion 1953 (fig. 20, page 106)

22. THERO-SALICORNIETEA Tüxen in Tüxen & Oberdorfer ex Géhu & Géhu-Franck 1984 nom. conserv.

[*Thero-Suaedetea* Rivas-Martínez 1972]

Halophytic pioneer vegetation, dominated by succulent therophytes that prosper in saline soils, in coastal and continental temporarily flooded marshes. Holarctic distribution.

Typus: Thero-Salicornietalia Tüxen in Tüxen & Oberdorfer ex Géhu & Géhu-Franck 1984 (22b.).

Characteristic species: *Suaeda albescens*.

22a. THERO-SUAEDETALIA Br.-Bl. & O. Bolòs 1958

Coastal or inland communities of halo-nitrophilous, fleshy annual plants, of summer or autumn physiognomic maxima, that usually develops in marshes or saline soils.

Typus: Thero-Suaedion Br.-Bl. in Br.-Bl., Roussine & Nègre 1952 (22.1.).

Characteristic species: *Cressa villosae*, *Salsola soda*, *Suaeda splendens*.

22.1. Thero-Suaedion Br.-Bl. in Br.-Bl., Roussine & Nègre 1952

Single alliance.

Typus: Suaedo splendentis-Salsoletum sodae Br.-Bl. ex Br.-Bl., Roussine & Nègre 1952 (22.1.1.).

Characteristic species: *Salsola soda*, *Suaeda albescens*, *Suaeda spicata*, *Suaeda splendens*.

22.1.1. *Suaedo splendentis-Salsoletum sodae* Br.-Bl. ex Br.-Bl., Roussine & Nègre 1952

22.1.2. *Cressetum villosae* Rothmaler 1943 corr. Rivas-Martínez, T.E. Díaz, Fernández-González, Izco, Loidi, Lousã & Penas 2002 [*Cressetum creticae* Rothmaler 1943]

22b. THERO-SALICORNIETALIA Tüxen in Tüxen & Oberdorfer ex Géhu & Géhu-Franck 1984

Succulent therophytic pioneer vegetation (*Salicornia* spp.), in temporarily flooded soils of marshes or its clearings, in the flat sandy or muddy shores. It occurs at the lowest levels of the marsh or in the inner parts of salt pans. Holarctic distribution.

Typus: Salicornion dolichostachyo-fragilis Géhu & Rivas-Martínez in Géhu & Géhu-Franck 1984 (22.2.).

Characteristic species: *Haloplepis amplexicaulis*.

22.2. Salicornion dolichostachyo-fragilis Géhu & Rivas-Martínez in Géhu & Géhu-Franck 1984

Communities of the Atlantic coast of Europe, generally composed by tetraploid species. They occupy the lowest positions of the marshes and are daily submerged during the high tides.

Typus: Salicornietum fragilis Géhu & Géhu-Franck 1984 (22.2.1.).

Characteristic species: *Salicornia fragilis*.

22.2.1. *Salicornietum fragilis* Géhu & Géhu-Franck 1984

22.3. Salicornion europaeo-ramosissimae Géhu & Géhu-Franck 1984

Atlantic communities dominated by diploid species of the genus *Salicornia*, typical of medium and high levels of salt marshes, both coastal and inland.

Typus: Salicornietum disarticulato-ramosissimae Géhu & Géhu-Franck 1984.

Characteristic species: *Salicornia ramosissima*.

22.3.1. *Halimiono portulacoidis-Salicornietum ramosissimae* J.C. Costa in J.C. Costa, Lousã & Espírito Santo 1996 corr. J.C. Costa in *Silva Lusit.* 12 (1): 125, 2004

[*Halimiono portulacoidis-Salicornietum patulae* J.C. Costa in J.C. Costa, Lousã & Espírito Santo 1996]

22.3.2. *Sarcocornio perennis-Salicornietum ramosissimae* (Géhu & Géhu-Franck 1979) Rivas-Martínez 1990

22.4. *Salicornion patulae* Géhu & Géhu-Franck 1984

Mediterranean communities composed of diploid and tetraploid species at the highest positions of salt marshes, extending to the mouth of the North Sea. These biotopes are inundated by rainwater in the winter, but are also subjected to strong summer drying.

Typus: Suaedo splendidis-Salicornietum patulae Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980 corr. Rivas-Martínez 1990 (22.4.1.).

Characteristic species: *Salicornia patula*.

22.4.1. *Suaedo splendidis-Salicornietum patulae* Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980 corr. Rivas-Martínez 1990

IV. CHASMOPHYTIC, EPIPHYTIC AND SCREE VEGETATION**IVa. ROCK CREVICE CHASMOPHYTIC VEGETATION****23. ADIANTETEA** Br.-Bl. in Br.-Bl., Roussine & Nègre 1952

Chasmophytic fern, seed plant and plentiful bryophytic communities, growing in water-flushed or water splashed rock crevices rich in calcium carbonate in thermo, meso-supramediterranean or temperate submediterranean bioclimate places.

Typus: Adiantetalia capilli-veneris Br.-Bl. ex Horvatic 1939 (23a.).

23a. ADIANTETALIA CAPILLI-VENERIS Br.-Bl. ex Horvatic 1939

Single order.

Typus: Adiantion capilli-veneris Br.-Bl. ex Horvatic 1934 (23.1.).

Characteristic species: *Adiantum capillus-veneris*, *Didymodon tophaceus*, *Eucladium verticillatum*, *Gymnostomum calcareum*, *Pellia endiviifolia*, *Southbya tophacea*.

23.1. Adiantion capilli-veneris Br.-Bl. ex Horvatic 1934

Bryo-pteridophytic communities of calcareous tufa and rock crevices with water flow.

Typus: Eucladio-Adiantetum capilli-veneris Br.-Bl. ex Horvatic 1934 (23.1.3.).

Characteristic species: *Didymodon spadiceus*, *Eurhynchium speciosum*, *Homalia lusitanica*, *Hymenostylium recurvirostrum*, *Pteris vittata*, *Thamnobryum alopecurum*.

23.1.1. *Dicrano scottiani-Adiantetum capilli-veneris* (Lüpnitz ex Deil 1996) J.C. Costa, Aguiar, Fernández-Prieto, Neto, Capelo & C. Sérgio in Neto, Capelo, C. Sérgio & J.C. Costa in *Phytocoenologia* 37 (2): 228-229, 2007
[*Conocephalo-Woodwardietum radicans* Brullo 1986 *dicranetosum scottiani* Lüpnitz ex Deil 1996]

23.1.2. *Didymodon spadicei-Adiantetum capilli-veneris* Neto, Capelo, C. Sérgio & J.C. Costa in *Phytocoenologia* 37 (2): 227, 2007 (fig. 21, page 106)

23.1.3. *Eucladio-Adiantetum capilli-veneris* Br.-Bl. ex Horvatic 1934

23.1.4. *Trachelio caerulei-Adiantetum capilli-veneris* O. Bolòs 1957

24. ASPLENIETEA TRICHOMANIS (Br.-Bl. in Meier & Br.-Bl. 1934) Oberdorfer 1977

Communities of hemicyptophytes, geophytes and chamaephytes occupying dry fissures of cliffs or walls (chasmophytes). Holarctic distribution.

Typus: Potentilletalia caulescentis Br.-Bl. in Br.-Bl. Jenny 1926.

Characteristic species: *Antirrhinum braun-blanquetii*, *Asplenium ruta-muraria*, *Chaenorhinum organifolium* subsp. *organifolium*, *Cystopteris fragilis*, *Hieracium amplexicaule*, *Pritzelago alpina* subsp. *auerswaldii*, *Sanguisorba rupicola*.

24a. ANDROSACETALIA VANDELLII Br.-Bl. in Meier & Br.-Bl. 1934

Chasmophytic vegetation of fissures of siliceous rocks Mediterranean and Eurosiberian distribution.

Typus: Androsacion vandellii Br.-Bl. 1926.

Characteristic species: *Asplenium adiantum-nigrum*, *Asplenium billotii*, *Asplenium septentrionale*, *Asplenium trichomanes* subsp. *trichomanes*, *Cheilanthes tinaei*, *Cystopteris dickieana*, *Hieracium schmidtii*.

24.1 Cheilanthion hispanicae Rivas Goday 1955

Rupicolous communities of quartzites and schists, meso-supramediterranean and submediterranean, West Iberian.

Typus: Bufonio willkommianae-Cheilanthetum hispanicae Rivas Goday 1955.

Characteristic species: *Bufonia willkommiana*, *Cheilanthes hispanica*, *Jasione mariana*.

24.1.1. *Asplenio billotii-Cheilanthetum hispanicae* Rivas-Goday in Sáenz & Rivas-Martínez 1979

24.1.2. *Asplenio billotii-Cheilanthetum tinaei* Rivas-Martínez & Costa 1973 corr. Sáenz & Rivas-Martínez 1979 nom. mut.

[*Asplenio billotii-Cheilanthetum duriensis* Rivas-Martínez & Costa 1973 corr. Sáenz & Rivas-Martínez 1979]

24.1.3. *Mucizonio hispidae-Cheilanthetum tinaei* Deil, Galán & Vicente in Feddes Report. 119 (5-6): 571, 2008

24.2. Saxifragion willkommianae Rivas-Martínez 1964

Supra-orotemperate and submediterranean communities, Carpetan-Leonese and Orocantabrian.

Typus: Saxifragetum willkommianae Rivas-Martínez 1964.

Characteristic species: *Alchemilla transiens*, *Murbeckiella boryi* subsp. *herminii*, *Silene acutifolia*.

24.2.1. *Murbeckiello sousae-Silenetum acutifoliae* Honrado & P. Alves ass. nova hoc loco

24.2.2. *Phalacrocarpo oppositifolii-Silenetum acutifoliae* Honrado, Pulgar, P. Alves & Ortiz ass. nova hoc loco

24.2.3. *Saxifrago spathularis-Murbeckielletum herminii* Br.-Bl., P. Silva, Rozeira & Fontes 1952 corr. Rivas-Martínez 1981

24.2.4. *Sileno acutifoliae-Holcetum gayanae* Bellot 1968

24b. *ASPLENIETALIA PETRARCHAE* Br.-Bl. in Br.-Bl. & Meier 1934 nom. mut.

[*Asplenietalia glandulosi* Br.-Bl. in Br.-Bl. & Meier 1934]

Order of rupicolous and heliophytic vegetation on limestone. Mediterranean distribution.

Typus: *Asplenion petrarchae* Br.-Bl. in Br.-Bl. & Meier 1934 nom. mut (24.3.).

Characteristic species: *Asplenium petrarchae*, *Cheilanthes acrostica*, *Cosentinia vellea*, *Melica minuta* subsp. *minuta*, *Phagnalon rupestre*, *Sanguisorba ancistroides*.

24.3. *Asplenion petrarchae* Br.-Bl. in Br.-Bl. & Meier 1934 nom. mut.

[*Asplenion glandulosi* Br.-Bl. in Br.-Bl. & Meier 1934]

Rupicolous communities on limestone, thermomediterranean to mesomediterranean dry to subhumid. Western Mediterranean distribution.

Typus: *Phagnalo sordidi-Asplenietum petrarchae* Br.-Bl. in Br.-Bl. & Meier 1934 nom. mut.

Characteristic species: *Narcissus calcicola*.

24.3.1. *Asplenio ceterach-Cheilanthes acrosticae* M.T. Santos 1987

24.3.2. *Narcisso calcicolae-Asplenietum rutae-murariae* Espírito Santo, Ladero & Lousã 1995

24.3.3. *Narcisso calcicolae-gaditanae* Pinto-Gomes, E. Cano, J.A. Torres, P. Ferreira & Rosa Pinto in Pinto-Gomes & P. Ferreira in Flora e Vegetação do Barrocal Algarvio. Tavira-Portimão: 175, 2005

24c. *NOTHOLAENO MARANTAE-CHEILANTHETALIA MADEIRENSIS* Sáenz & Rivas-Martínez 1979 nom. mut.

[*Cheilanthetalia maranto-maderensis* Sáenz & Rivas-Martínez 1979]

Vegetation of siliceous rocks rich in metals and serpentinites.

Typus: *Cheilanthion pulchellae* Sáenz & Rivas-Martínez 1979 (24.5.).

Characteristic species: *Cheilanthes guanchica*, *Cheilanthes maderensis*, *Notholaena marantae* subsp. *marantae*.

24.4. *Phagnalo saxatilis-Cheilanthion maderensis* Loisel 1970 corr. F.J. Pérez, T.E. Díaz, P. Fernández & Salvo 1989

Iberian rupicolous communities.

Typus: *Cheilantho maderensis-Notholaenetum marantae* O. Bolòs 1956 corr. F.J. Pérez, T.E. Díaz, P. Fernández & Salvo 1989.

Characteristic species: *Asplenium obovatum*.

24.4.1. *Notholaenetum marantae* (P. Silva 1970) Capelo, Aguiar & Gomes Pedro 1996

24.4.2. *Umbilico violacei-Asplenietum corunnensis* P. Silva 1970 corr. Rivas-Martínez & Izco 2002 [*Umbilico-Asplenietum cuneifolii* P. Silva 1970]

24.5. *Cheilanthion pulchellae* Sáenz & Rivas-Martínez 1979

Rupicolous communities of Madeira and Canaries archipelagos.

Typus: *Adianto pusilli-Cheilanthes pulchellae* Sáenz & Rivas-Martínez 1979.

Characteristic species: *Adiantum reniforme* subsp. *reniforme*, *Adiantum reniforme* subsp. *pusillum*, *Asplenium aethiopicum* *Asplenium monanthes*, *Asplenium trichomanes* subsp. *maderense*, *Notholaena marantae* subsp. *subcordata*.

24.5.1. *Adiantetum reniformis* Capelo, J.C. Costa, Jardim, Sequeira & Rivas-Martínez in Silva Lusit. 11(2): 260, 2003 (fig. 22, page 107)

24.5.2. *Notholaenetum subcordatae* Capelo, J.C. Costa, Jardim, Sequeira & Rivas-Martínez in Silva Lusit. 11(2): 259, 2003

25. PARIETARIETEA JUDAICAE Rivas-Martínez in Rivas Goday 1964

Nitrophilous, rupicolous, sometimes epiphytic vegetation, consisting in chasmophytes or chomophytes demanding nitrates and ammonium salts. Cosmopolite distribution in urban and rural areas.

Typus: *Parietarietalia judaicae* (Rivas-Martínez 1960) Rivas Goday 1964 (25a.).

25a. *PARIETARIETALIA JUDAICAE* (Rivas-Martínez 1960) Rivas Goday 1964

Single order.

Typus: *Parietario judaicae-Centralthion rubri* Rivas-Martínez 1960 (25.1.).

Characteristic species: *Antirrhinum majus* subsp. *majus*, *Cheiranthus cheiri*, *Chelidonium majus*, *Cymbalaria muralis*, *Cyrtomium falcatum*, *Erigeron karwinskianus*, *Ficus carica*, *Hyoscyamus albus*, *Lavatera maritima*, *Matthiola incana*, *Parietaria judaica*, *Piptatherum coerulescens*, *Sonchus tenerrimus*, *Umbilicus gaditanus*, *Umbilicus heylandianus*, *Umbilicus rupestris*.

25.1. Parietario judaicae-Centralthion rubri Rivas-Martínez 1960

[*Parietario-Galion muralis* Rivas-Martínez ex Rivas Goday 1964]

Thermophilous, nitrophilous and seminitrophilous communities, walled urban refuges and animals (especially birds) on rocky surfaces. Mediterranean optimal distribution but can penetrate the Eurosiberian thermophilous more exposed positions to direct sunlight.

Typus: *Parietarietum judaicae* Arènes ex Br.-Bl. in Br.-Bl., Roussine & Nègre 1952 (25.1.4.).

Characteristic species: *Antirrhinum meonanthum* subsp. *meonanthum*, *Centranthus ruber*, *Hypericum x inodorum*, *Micromeria juliana*, *Tolpis succulent* (ter.).

25.1.1. *Antirrhino linkiani-Parietarietum judaicae* Ortíz 1989

[*Centrantho rubri-Antirrhinetum linkiani* Mouga, J.C. Costa & Espírito Santo 1995]

25.1.2. *Centranthetum rubri* Oberdorfer 1969

25.1.3. *Parietarietum judaicae* Arènes ex Br.-Bl. in Br.-Bl., Roussine & Nègre 1952

25.1.4. *Parietario judaicae-Chelidonetum majoris* O. Bolòs & Masalles 1983

25.1.5. *Tolpido succulentae-Parietarietum judaicae* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000

25.2. Cymbalario-Asplenion Segal 1969

Community of wet, dark and old walls. With an Euro-siberian optimal distribution, can penetrate the Mediterranean (in the darkest positions exposed to the north).

Typus: Adiantum capilli-veneris-Parietarietum judaicae Segal 1969 (25.2.1.).

Characteristic species: *Asplenium azoricum*, *Asplenium ceterach*, *Asplenium trichomanes* subsp. *quadrivalens*, *Ceterach lolegnamense*, *Trachelium caeruleum*.

25.2.1. Adiantum capilli-veneris-Parietarietum judaicae Segal 1969

[*Cymbalario muralis-Adiantetum capilli-veneris* Rivas-Martínez, Wildpret, Del Arco, O. Rodríguez, Pérez de Paz, García Gallo, Acebes, T.E. Díaz & Fernández-González 1993 (syntax. syn.)]

25.2.2. Asplenio azoricae-Cymbalarietum muralis Rivas-Martínez, Lousã, F. Prieto, J.C. Costa, Díaz & Aguiar 2002**25.2.3. Cymbalarietum muralis** Görs 1966**25.2.4. Cymbalario-Trachelietum caerulei** Rivas-Martínez 1969**25.2.5. Sileno acutifoliae-Umbilicetum rupestris** Honrado, P. Alves & B. Caldas ass. nova hoc loco**25.3. Asplenion marini** Rivas-Martínez & Izco 2002

Chasmophytic sub-halophyte communities dominated by ferns on coastal rocks subjected to salt-laden winds.

Typus: Asplenietum marini Br.-Bl. & Tüxen 1952 (25.3.1.).

Characteristic species: *Asplenium marinum*.

25.3.1. Asplenietum marini Br.-Bl. & Tüxen 1952**25.3.2. Soncho maderensis-Asplenietum marini** Capelo, J.C. Costa, Jardim, Sequeira & Rivas-Martínez in Silva Lusit. 11(2): 260, 2003**25.3.3. Umbilico gaditani-Asplenietum marini** Rivas-Martínez, Lousã, F. Prieto, J.C. Costa, Dias & Aguiar 2002**IVB. CHASMOCHOMOPHYTIC, EPIPHYTIC AND SCREE VEGETATION****26. ANOMODONTO VITICULOSAE-POLYPODIETEA CAMBRICI** Rivas-Martínez 1975

Pterido-bryophytic epiphytic vegetation, typical of wet rocks and shady slopes or in compact ground and deep fissures of rocks with a thin layer of soil that retains moisture. The ecological optimum is in forest environment, and can be found in rainy areas of temperate and Mediterranean oceanic and hyperoceanic bioclimate.

Typus: Anomodonto viticulosae-Polypodietales cambrici O. Bolòs & Vives in O. Bolòs 1957 (26a.).

26a. ANOMODONTO VITICULOSAE-POLYPODIETALIA CAMBRICI O. Bolòs & Vives in O. Bolòs 1957

Single order.

Typus: Polypodium cambrici Br.-Bl. in Br.-Bl., Roussine & Nègre 1952 nom. mut. (26.1.)

Characteristic species: *Anomodon viticulosus*, *Davallia canariensis*, *Drepanolejeunea hamatifolia*, *Frullania tamarisci*, *Homalothecium sericeum*, *Isothecium*

myosuroides, *Plagiochila spinulosa*, *Polypodium interjectum*, *Polypodium macaronesicum*, *Porella platyphylla*, *Selaginella denticulata*, *Thuidium tamariscinum*.

26.1. Polypodium cambrici Br.-Bl. in Br.-Bl., Roussine & Nègre 1952 nom. mut.

[*Polypodium serrati* Br.-Bl. in Br.-Bl., Roussine & Nègre 1952]

Epiphytic or leptosols communities in shady forests; Mediterranean and Atlantic Europe, characterized by *Polypodium cambricum*.

Typus: Polypodietum cambrici Br.-Bl. in Br.-Bl., Roussine & Nègre 1952 nom. mut. (26.1.1.)

Characteristic species: *Ctenidium molluscum*, *Encalypta streptocarpa*, *Neckera crispa*, *Neckera pumila*, *Polypodium cambricum*, *Porella obtusata*, *Tortella tortuosa*.

26.1a. Polypodiunion cambrici (Br.-Bl. in Br.-Bl., Roussine & Nègre 1952) Rivas-Martínez 2002

Communities on a bed of soil rich in carbonates.

Typus: Polypodietum cambrici Br.-Bl. in Br.-Bl., Roussine & Nègre 1952 nom. mut. (26.1.1.)

26.1.1. Polypodietum cambrici Br.-Bl. in Br.-Bl., Roussine & Nègre 1952 nom. mut.

[*Polypodietum serrati* Br.-Bl. in Br.-Bl., Roussine & Nègre 1952]

26.1b. Bartramio strictae-Polypodiunion cambrici (O. Bolòs & Vives in O. Bolòs 1952) Rivas-Martínez 2002

[*Bartramio-Polypodium serrati* O. Bolòs & Vives in O. Bolòs 1957]

Communities on carbonate-poor soil.

Typus: Sedo cepaeae-Polypodietum cambrici O. Bolòs & Vives in O. Bolòs 1952.

Characteristic species: *Asplenium hemionitis*, *Bartramia stricta*, *Exormotheca pustulosa*, *Pterogonium gracile*, *Reboulia hemisphaerica*, *Targionia hypophylla*.

26.1.2. Anogrammo leptophyllae-Umbilicetum rupestris Amor, Ladero & C. Valle 1993**26.1.3. Anogrammo leptophyllae-Davallietum canariensis** Bellot & Casaseca in Casaseca 1959 nom. mut.

[*Gymnogrammo leptophyllae-Davallietum canariensis* Bellot & Casaseca in Casaseca 1959]

26.1.4. Anogrammo leptophyllae-Umbilicetum rupestris Amor, Ladero & C. Valle 1993**26.1.5. Davallio canariensis-Polypodietum macaronesici** Rivas-Martínez, Wildpret, Del Arco, O. Rodríguez, Pérez de Paz, García Gallo, Acebes, T.E. Díaz & Fernández-González ex Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000**26.1.6. Davallio canariensis-Saxifragetum portosantanae** Jardim, Capelo, Sequeira & Aguiar in Capelo, J.C. Costa, Jardim, Sequeira & Rivas-Martínez in Silva Lusit. 11(2): 262, 2003**26.1.7. Neckero pumilae-Polypodietum interjecti** Honrado, Hespanhol, Vieira, Séneca & B. Caldas in Honrado, P. Alves, Nepomuceno & B. Caldas in Silva Lusit. 10(2): 253, 2002

26.2. *Hymenophyllum tunbrigensis* Tüxen in Tüxen & Oberdorfer 1958

Epiphytic and shadowy communities with *Hymenophyllum* ssp., hyperoceanic humid to hyperhumid, Coastal Lusitanian-Andalusian, Cantabrian-Atlantic, Azorean, Madeiran and Canarian.

Typus: Hymenophylletum tunbrigensis Br.-Bl. in Br.-Bl. & Tüxen 1952.

Characteristic species: *Asplenium anceps*, *Elaphoglossum semicylindricum*, *Hymenophyllum maderense*, *Hymenophyllum tunbrigense*, *Hymenophyllum wilsonii*, *Polypodium azoricum*, *Saccogyna viticulosa*, *Vandenboschia speciosa*.

26.2.1. *Elaphoglossum semicylindricum*-*Polypodium azoricum* Rivas-Martínez, Lousã, F. Prieto, J.C. Costa, Dias & Aguiar 2002

26.2.2. *Hymenophylletum tunbrigensis-maderense* Capelo, J.C. Costa, Jardim, Sequeira & Rivas-Martínez in Silva Lusit. 11(2): 262, 2003

26.3. *Selaginello denticulatae-Anogrammion leptophyllae* Rivas-Martínez, Fernández-González & Loidi 1999

Chasmophytic bryo-pteridophytic ephemeral communities, found in herbaceous edges of woods, slopes and walls, rich in organic matter, Mediterranean.

Typus: Selaginello denticulatae-Anogrammetum leptophyllae Molinier 1937 (26.3.1.).

Characteristic species: *Anogramma leptophylla*, *Selaginella kraussiana*.

26.3.1. *Selaginello denticulatae-Anogrammetum leptophyllae* Molinier 1937

26.3.2. *Selaginello denticulatae-Cystopteridetum viridulae* Capelo, J.C. Costa, Jardim, Sequeira & Rivas-Martínez in Silva Lusit. 11(2): 261, 2003

26.4. *Thelypterido pozoi-Woodwardion radicans* F. Prieto & Aguiar in F. Prieto, Aguiar & Dias in Int. J. Geobot. Res. 2: 112. 2012

Chomophytic communities of rocky or earthy slopes dominated by medium to large sized ferns, present on rainy temperate and Mediterranean hyperoceanic territories, in the Madeiran and Atlantic European provinces.

Typus: Diplazio caudati-Woodwardietum radicans F. Prieto & Aguiar in Fernández-Prieto, Aguiar & Dias 2012 (26.4.2.).

Characteristic species: *Cystopteris diaphana*, *Diplazium caudatum* (dif.), *Selaginella azorica*, *Thelypteris pozoi*, *Woodwardia radicans*.

26.4.1. *Carici lowei-Woodwardietum radicans* J.C. Costa, Capelo, Jardim & Sequeira ass. nova hoc loco (fig. 23, page 107)
[Community of *Woodwardia radicans* J.C. Costa et al. 2004]

26.4.2. *Diplazio caudati-Woodwardietum radicans* F. Prieto & Aguiar in Fernández-Prieto, Aguiar & Dias in Int. J. Geobot. Res. 2: 112. 2012

26.4.3. *Selaginello azoricae-Stegnogrammetum pozoi* F. Prieto & Aguiar in Fernández-Prieto, Aguiar & Dias in Int. J. Geobot. Res. 2: 112. 2012

27. GREENOVIO-AEONIETEA Santos 1976

Chomophytic and chasmochomophytic perennial communities mostly composed by succulent semi-deciduous *Crassulaceae* species, with a great number of endemic chamaephytes (*Aeonium*, *Aichryson*, *Greenovia*, *Sedum*), growing on rock surfaces, crevices and walls, in the Canaries and Madeira archipelagos.

Typus: Soncho acaulis-Aeonietalia Rivas Goday & Esteve ex Sunding 1972 nom. mut. (27a.)

Characteristic species: *Andryala varia*, *Arabis caucasica*.

27a. SONCHO ACAULIS-AEONIETALIA Rivas Goday & Esteve ex Sunding 1972 nom. mut.
[*Soncho-Sempervivetalia* Rivas Goday & Esteve ex Sunding 1972]

Single order.

Typus: Soncho acaulis-Aeonion Sunding 1972.

27.1. *Sinapidendro angustifolii-Aeonion glutinosi* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000

Madeiran chasmochomophytic communities.

Typus: Sedo nudi-Aeonietum glutinosi Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 (27.2.3.).

Characteristic species: *Aeonium glandulosum*, *Aeonium glutinosum*, *Aeonium x meyerheimii*, *Andryala crithmifolia*, *Crepis andryaloides*, *Galium productum*, *Matthiola maderensis*, *Micromeria thymoides* subsp. *thymoides* var. *cacuminicolae*, *Monizia edulis*, *Musschia aurea*, *Plantago leiopetala*, *Saxifraga maderensis* var. *maderensis*, *Saxifraga maderensis* var. *pickeringii*, *Sedum brissemoretii*, *Sedum farinosum*, *Sedum fusiforme*, *Sedum nudum*, *Sinapidendron angustifolium*, *Sinapidendron frutescens*, *Sinapidendron gymnocalyx*, *Sinapidendron rupestre*, *Sonchus ustulatus* subsp. *maderensis*, *Sonchus ustulatus* subsp. *ustulatus*, *Tolpis macrorrhiza*.

27.2.1. *Aichrysetum divaricato-villosi* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000

27.2.2. *Musschiaetum aureae* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 (fig. 24, page 107)

27.2.3. *Sedo nudi-Aeonietum glutinosi* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 (fig. 25, page 107)

27.2.4. *Sinapidendro frutescens-Aeonietum glandulosi* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 (fig. 26, page 107)

27.2.5. *Sinapidendro gymnocalycis-Sedetum brissemoretii* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000

27.2.6. Community of *Monizia edulis*

27.2. *Aichryso laxi-Monanthion laxiflorae* Santos & Reyes Betncort in Publ. Estud. Canarias, Monografía 78: 175, 2009

Chasmophytic communities of small succulent perennials (*Aichryson*, *Monanthes*) on volcanic rock.

Typus: *Davallio canariensis-Aichrysetum laxi* Wildpret, Garcia Galo & Carqué in Rivas-Martínez, Wildpret, Del Arco, O. Rodríguez, Pérez de Paz, García Gallo, Acebes, T.E. Díaz & Fernández-González 1993.

Characteristic species: *Aichryson divaricatum*, *Aichryson dumosum*, *Aichryson villosum*, *Monanthes loweias*.

27.1.1. *Aichrysetum dumosi* J.C. Costa, Capelo, Jardim & Sequeira ass. nova hoc loco

27.1.2. *Monanthes lowei* Pérez de Paz & Acebes 1985

28. PHAGNALO-RUMICETEA INDURATI (Rivas Goday & Esteve 1972) Rivas-Martínez, Izco & Costa 1973

Dwarf perennial chasmochomophytic communities developed on siliceous and dolomite, in earthy broad crevices, walls and loose shifting stones in thermo to oromediterranean and temperate submediterranean bioclimate of the Iberian Peninsula and the Maghrebi North Africa.

Typus: *Phagnalo saxatilis-Rumicetalia indurati* Rivas Goday & Esteve 1972 (28a.).

28a. PHAGNALO SAXATILIS-RUMICETALIA INDURATI Rivas Goday & Esteve 1972

Single order.

Typus: *Andryalium ramosissimae* Rivas Goday & Esteve 1972.

Characteristic species: *Anarrhinum bellidifolium*, *Anarrhinum duriminium*, *Dianthus broteri* subsp. *broteri*, *Rumex induratus*, *Saxifraga granulata*, *Sedum hirsutum* subsp. *hirsutum*, *Sedum mucizonia*.

28.1. Rumici indurati-Dianthion lusitani Rivas-Martínez, Izco & Costa ex V. Fuente 1986

Heliophilous and xerophilous communities, colonizing large fissures of siliceous rocks, meso to oromediterranean, Mediterranean Western Iberian and Oroiberian.

Typus: *Crepido oporinoidis-Rumicetum indurati* Rivas-Martínez, Fernández-González & Sánchez-Mata 1986.

Characteristic species: *Antirrhinum graniticum*, *Coincya pseudoerucastrum* subsp. *pseudoerucastrum*, *Conopodium majus* subsp. *marizianum*, *Dianthus crassipes* subsp. *crassipes*, *Dianthus lusitanus*, *Digitalis purpurea* subsp. *heywoodii*, *Digitalis purpurea* subsp. *mariana*, *Digitalis purpurea* subsp. *aman-diana*, *Digitalis thapsi*, *Erysimum lagascae*, *Erysimum linifolium*, *Narcissus rupicola*, *Scrophularia schousboei* subsp. *schousboei*, *Scrophularia valdesii*, *Silene marizii*, *Silene x montistellensis*.

28.1.1. *Centaureo geresensis-Rumicetum indurati* P. Alves & Honrado ass. nova hoc loco

28.1.2. *Digitalis thapsi-Dianthion lusitani* Rivas-Martínez ex V. Fuente 1986

28.1.3. *Phagnalo saxatilis-Rumicetum indurati* Rivas-Martínez ex F. Navarro & C.J. Valle 1984

28.1.4. *Sileno acutifoliae-Dianthion lusitani* Vicente & Galán in Acta Bot. Malacitana 33: 175, 2008

28.1.5. *Sileno montistellensis-Dianthion lusitani* Rivas-Martínez 1981 corr. Ladero, Rivas-Martínez, Amor, M. T. Santos & Alonso 1999

28.2. Saxifragion fragosoi Rivas-Martínez in Rivas-Martínez, Fernández-González & Sánchez-Mata 1986 nom. mut.

[*Saxifragion continentalis* Rivas-Martínez in Rivas-Martínez, Fernández-González & Sánchez-Mata 1986]

Chasmochomophytic communities in somewhat shadowy terrigenous rocky walls, supramediterranean and supratemperate submediterranean, subhumid to hyperhumid, Carpetan Leonese and Orocantabrian.

Typus: *Sedo hirsuti-Saxifragetum fragosoi* Rivas-Martínez 1964 nom. mut. (28.2.2.)

Characteristic species: *Antirrhinum meonanthum* subsp. *ambiguum*, *Saxifraga fragosoi*.

28.2.1. *Phalacrocarpo oppositifolii-Saxifragetum fragosoi* Ortiz & Izco ex Pérez Carro, T.E. Díaz, Fernández Areces & Salvo 1989 nom. mut. (fig.27, page 108)

[*Phalacrocarpo oppositifolii-Saxifragetum continentalis* Ortiz & Izco ex Pérez Carro, T.E. Díaz, Fernández Areces & Salvo 1989]

28.2.2. *Sedo hirsuti-Saxifragetum fragosoi* Rivas-Martínez 1964 nom. mut.

[*Sedo hirsuti-Saxifragetum continentalis* Rivas-Martínez 1964]

28.3. Calendulo lusitanicae-Antirrhinion linkiani Ladero, C. Valle, M.T. Santos, Amor, Espirito Santo, Lousã & J.C. Costa 1991

Chasmochomophytic communities on limestone, sometimes dolomites, in the thermo mesomediterranean belts, in the Dividing Portuguese Sector and Arrábida range.

Typus: *Sileno longiciliae-Antirrhinetum linkiani* Ladero, C. Valle, M.T. Santos, Amor, Espirito Santo, Lousã & J.C. Costa 1991 (28.3.2.).

Characteristic species: *Antirrhinum linkianum*, *Arabis sadina*, *Avenula lodunensis* subsp. *occidentalis*, *Biscutella lusitanica*, *Calendula suffruticosa* subsp. *lusitanica*, *Coincya pseudoerucastrum* subsp. *cintrana*, *Dianthus cintranus* subsp. *barbatus*, *Rumex intermedius* subsp. *lusitanicus*, *Saxifraga cintrana*, *Silene longicilia*.

28.3.1. *Phagnalo saxatilis-Dianthion barbati* C. Lopes, Pinto-Gomes, Lousã & Ladero ass. nova hoc loco

[*Phagnalo saxatilis-Dianthion barbati* C. Lopes 2001 nom. inval. (art. 1)]

28.3.2. *Sileno longiciliae-Antirrhinetum linkiani* Ladero, C. Valle, M.T. Santos, Amor, Espirito Santo, Lousã & J.C. Costa 1991

28.4. *Sesamoidion suffruticosae* Ortiz & Pulgar 2000
Siliceous communities, temperate submediterranean and mesomediterranean, with austral Galician-Portuguese distribution.

Typus: Sesamoido suffruticosae-Anarrhinetum bellidifolii Ortiz & Pulgar 2000 (28.4.2.).

Characteristic species: *Anarrhinum longipedicellatum*, *Coincya pseudoerucastrum* subsp. *puberula*, *Reseda media*, *Sesamoides suffruticosa* subsp. *suffruticosa*.

28.4.1. *Anarrhinetum longipedicellati* Monteiro-Henriques, J.C. Costa & Aguiar ass. nova hoc loco

28.4.2. *Sesamoido suffruticosae-Anarrhinetum bellidifolii* Ortiz & Pulgar 2000

28.4.3. *Sesamoido suffruticosae-Anarrhinetum durimini* Ortiz & J. Rodríguez 1993

29. *THLASPIETEA ROTUNDIFOLII* Br.-Bl. 1948

Communities of mobile gravel, rich in endemic species, formed by hemicryptophytes and rhizomatous geophytes. Colonizers of slopes, moraines, riverine gravel deposits, cracks caused by ice in the Eurasian high mountains, in boreal, temperate and Mediterranean bioclimate. Holarctic distribution.

Typus: Thlaspietalia rotundifoliae Br.-Bl. in Br.-Bl. & Jenny 1926 (29a.).

Characteristic species: *Biscutella valentina* subsp. *valentina*, *Linaria supina*.

29a. *ANDROSACETALIA ALPINA* Br.-Bl. in Br.-Bl. & Jenny 1926

Communities of mobile gravel, that colonize siliceous soils poor in bases, in the Eurosiberian and Mediterranean high mountains.

Typus: Androsacion alpinae Br.-Bl. in Br.-Bl. & Jenny 1926.

Characteristic species: *Epilobium lanceolatum*, *Paronychia polygonifolia*.

29.1. *Linario saxatilis-Senecionion carpetani* Rivas-Martínez 1964

Orophilous communities, supra to cryotemperate, Carpetan-Leonese, Oroiberian, Orocantabrian.

Typus: Digitali carpetanae-Senecionetum carpetani Rivas-Martínez 1964.

Characteristic species: *Arrhenatherum carpetanum*, *Coincya nevadensis* subsp. *orophila*, *Digitalis purpurea* subsp. *carpetana*, *Leontodon hispidus* subsp. *bourgaeanus*, *Linaria saxatilis* subsp. *glabrescens*, *Reseda gredensis*, *Rumex suffruticosus*, *Senecio pyrenaicus* subsp. *caespitosus*, *Silene foetida*, *Solidago virgaurea* subsp. *fallit-tirones*, *Trisetum hispidum*, *Viola langeana*.

29.1.1. *Digitali carpetanae-Leontodontetum bourgaeani* Jansen 1998

29.1.2. *Phalacrocarpo oppositifolii-Rumicetum suffruticosi* Rivas-Martínez 1981

29.1.3. *Violetum langeanae* Ortiz & Samaniego 1989

29b. *POLYSTICHETALIA LONCHITIDIS* Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas 1984

Saxicolous communities with abundant caespitose rhizomatous ferns, growing on cracks of semi-fixed morainic blocks, karstic crevices and block deposits resulting from freeze-thaw, in boreal, temperate and Mediterranean high mountains.

Typus: Dryopteridion oreadis Rivas-Martínez 1977 corr. Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas 1984 (29.2.).

Characteristic species: *Phegopteris connectilis*.

29.2. *Dryopteridion oreadis* Rivas-Martínez 1977 corr. Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas 1984

Communities of high mountains, dominated by ferns, growing between large stabilized blocks or in periglacial morainic sediments. Holarctic and Eurasian distribution.

Typus: Cryptogrammo-Dryopteridetum oreadis Rivas-Martínez in Rivas-Martínez & Costa 1970 corr. Rivas-Martínez, Báscones, T.E. Díaz, Fernández-González & Loidi 1991 (29.2.1.).

Characteristic species: *Cryptogramma crispa*, *Dryopteris expansa*, *Dryopteris oreades*.

29.2.1. *Cryptogrammo-Dryopteridetum oreadis* Rivas-Martínez in Rivas-Martínez & Costa 1970 corr. Rivas-Martínez, Báscones, T.E. Díaz, Fernández-González & Loidi 1991

29c. *ANDRYALETALIA RAGUSINAE* Rivas Goday ex Rivas Goday & Esteve 1972

Plant communities developing on gravel, pebbles, and boulders accumulations, thermo to oromediterranean, dry subhumid. Western Mediterranean distribution.

Typus: Andryalion ragusinae Rivas Goday & Esteve 1972.

Characteristic species: *Andryala ragusina*, *Lactuca chondrilliflora*, *Lactuca viminea*, *Scrophularia canina* subsp. *canina*, *Silene inaperta*.

29.3. *Glaucion flavi* Br.-Bl. ex Tchou 1948

Mediterranean communities of riverine gravel deposits.

Typus: Glaucio flavi-Scrophularietum caninae Br.-Bl. ex Tchou 1948.

29.3.1. *Lactucho chondrilliflorae-Andryaletum ragusinae* Penas, T.E. Díaz, López Pacheco & M.E. García 1987

V. SYNANTHROPIC, FRINGE AND MEGAFORBIC VEGETATION

Va. SYNANTHROPIC VEGETATION

30. *ARTEMISIETEA VULGARIS* Lohmeyer, Preising & Tüxen in Tüxen 1950 ex von Rochow 1951

Pioneer and ruderal sunny vegetation composed by perennial and tall biennial forbs, grasses and thistles. These communities prosper in deep soils enriched in nitrogen (due to man or cattle action). In Mediterranean pluviseasonal and temperate bioclimate. Holarctic distribution, and neophytes in all cold tropical areas.

Typus: Artemisietalia vulgaris Lohmeyer in Tüxen 1947 (30a).

Characteristic species: *Artemisia absinthium*, *Artemisia vulgaris*, *Cirsium vulgare*, *Daucus carota*, *Dipsacus comosus*, *Echium vulgare*, *Lactuca serriola*, *Marrubium vulgare*, *Reseda lutea* subsp. *lutea*, *Salvia verbenaca* subsp. *verbenaca*.

30A. *ARTEMISIENEA VULGARIS* (Lohmeyer, Preising & Tüxen in Tüxen 1950 ex von Rochow 1951) Rivas Goday & Borja 1961

Perennial ruderal forbs and pioneer nitrophilous communities, in temperate bioclimate.

Typus: Artemisietalia vulgaris Lohmeyer in Tüxen 1947 (30a).

Characteristic species: *Picris echioides*, *Tanacetum parthenium*.

30a. *ARTEMISIETALIA VULGARIS* Lohmeyer in Tüxen 1947

Ruderal forbs of temperate sunny communities.

Typus: Arction lappae Tüxen 1937 (30.1.).

Characteristic species: *Artemisia verlotiorum*, *Foeniculum vulgare* subsp. *vulgare*, *Salvia aethiops*, *Tanacetum vulgare*.

30.1. *Arction lappae* Tüxen 1937

Hemicryptophytic communities of ruderal-nitrophilous plants, which develop in the suburbs of urban areas and in rural environments, on deep soils. In meso orotemperate bioclimate, with Eurasian distribution.

Typus: Urtico urentis-Chenopodietum boni-henrici Tüxen 1937.

Characteristic species: *Arctium minus*, *Geranium pyrenaicum* subsp. *lusitanicum*, *Geranium pyrenaicum* subsp. *pyrenaicum*, *Nepeta latifolia*, *Scrophularia herminii*.

30.1.1. *Balloto foetidae-Arctietum minoris* O. Bolòs 1959

30.1.2. *Geranio lusitanici-Scrophularietum herminii* Honrado, P. Alves, Lomba, Rocha, J. Torres, S. Ortiz & B. Caldas in Acta Bot. Gallica 151(4): 396, 2004

30.2. *Dauco-Melilotion* Görs 1966

Ruderal communities dominated by large biennial pioneer nitrophilous herbs in rural altered or disturbed soils, and other urban nitrophilous soils.

Typus: Dauco carotae-Picridetum hieracioides Görs 1966.

Characteristic species: *Echium lusitanicum* subsp. *lusitanicum*, *Echium rosulatum*, *Melilotus albus*, *Melilotus officinalis*.

30.2.1. *Echio rosulati-Picridetum echioidis* P. Alves & Honrado in Honrado, P. Alves, Nepomuceno & B. Caldas in Silva Lusit. 10(2): 255, 2002

30b. *ELYTRIGIETALIA INTERMEDIO-REPENTIS* Oberdorfer, Müller & Görs in Oberdorfer, Görs, Korneck, Lohmeyer, Müller, Philippi & Seibert 1967 nom. mut.

[*Agropyretalia repentis* Oberdorfer, Müller & Görs in Oberdorfer, Görs, Korneck, Lohmeyer, Müller, Philippi & Seibert 1967]

Temperate, nitrophilous perennial and pioneer grasslands dominated by *Elytrigia* spp., with Eurosiberian distribution and Mediterranean humid disjunctions.

Typus: Convolvulo arvensis-Elytrigion repentis Görs 1966 num. mut.

Characteristic species: *Aster squamatus*, *Convolvulus arvensis*, *Elytrigia repens*, *Equisetum arvense*, *Oenothera affinis*, *Oenothera biennis*, *Oenothera glazioviana*, *Poa angustifolia*.

30.3. *Elytrigion athericae* Géhu 1968 nom. mut.

[*Agropyron pungentis* Géhu 1968]

Dense sub-halophiles pioneer grasslands, dominated by *Elytrigia atherica*, which occupy nitrophilous biotopes strongly enriched in organic matter left by the sea, especially on the banks of estuaries. Atlantic distribution on sandy substrates.

Typus: Elytrigietum athericae Géhu 1968 nom. mut.

Characteristic species: *Agrostis stolonifera* var. *pseudopungens*, *Elytrigia atherica*, *Tripleurospermum perforatum*.

30.3.1. *Inulo crithmoidis-Elytrigietum athericae* Géhu ex Izco, Guitián & J.M. Sánchez 1993 nom. mut.

[*Inulo crithmoidis-Elymetum pycnanthi* Géhu ex Izco, Guitián & J.M. Sánchez 1993]

30c. *BRASSICO OLERACEAE-LAVATERETALIA ARBOREAE* Rivas-Martínez in Itinera Geobot. 18(2): 437, 2011

Communities composed by hemicryptophytes, chamaephytes nanophanerophytes growing in nitrophilous environments submitted to sea salt spray (coastal rocky cliffs) and microsoils enriched by the droppings of seabirds. Distribution: Cantabrian-Atlantic, Franc-British, Coastal Lusitanian-Andalusian and circum-Mediterranean.

Typus: Brassicion oleraceae Rivas-Martínez, Fernández-González & Loidi 1999 (30.4.).

Characteristic species: *Lavatera arborea*.

30.4. *Brassicion oleraceae* Rivas-Martínez, Fernández-González & Loidi 1999

Communities of sea rocks, caps and islets Cantabrian-Atlantic, Franc-British and Coastal Lusitan-Andalusian.

Typus: Crithmo maritimi-Brassicetum oleraceae F. Prieto & Honera 1993.

Characteristic species: *Calendula algarbiensis*, *Calendula incana*, *Matricaria maritima*, *Scrophularia sublyrata*.

30.4.1. *Calendulo algarbiensis-Parietarietum judaicae* J. & P. Guitián ex Izco & Amigo 2001

30.4.2. *Scrophulario sublyratae-Lavateretum arboreae* J.C. Costa, Capelo, Neto, Arsénio & Lousã ass nova hoc loco

30B. *ONOPORDENEA ACANTHII* Rivas-Martínez, Bascónes, T.E. Díaz, Fernández-González & Loidi 2002

Nitrophilous or sub-nitrophilous communities dominated by large thistles and other biennial or perennial plants, on disturbed soils, edges of roads or paths and resting places for animals. With a Mediterranean optimal distribution and Eurosiberian disjunctions.

Typus: Onopordetalia acanthii Br.-Bl. & Tüxen ex Klika & Hadač 1944 (30d).

Characteristic species: *Allium ampeloprasum*, *Carduus pycnocephalus*, *Carduus tenuiflorus*, *Carlina corymbosa* subsp. *hispanica*, *Centaurea calcitrapa*, *Chondrilla juncea*, *Cichorium intybus*, *Eryngium campestre*, *Hyoscyamus niger*, *Onopordum acanthium* subsp. *acanthium*, *Reseda luteola*, *Verbascum pulverulentum*, *Verbascum virgatum*.

30d. ONOPORDETALIA ACANTHII Br.-Bl. & Tüxen ex Klika & Hadač 1944

Pioneer communities of perennial thistles and mullein in abandoned agricultural fields, amended soil, slopes, meso-orotemperate supra-oromediterranean.

Typus: Onopordion acanthii Br.-Bl. in Br.-Bl., Gajweski, Wraber & Wallas 1936.

Characteristic species: *Cichorium endivia* subsp. *pumilum*, *Lactuca virosa*, *Onopordum illyricum*, *Verbascum thapsus* subsp. *montanum*.

30.5. Carduo carpetani-Cirsion odontolepidis Rivas-Martínez, Penas & T.E. Díaz 1986

Nitrophilous ruderal communities of thistles and mullein, which colonize amended deep soils, supra-oromediterranean and supra-orotemperate, in the Iberian-Mediterranean mountains.

Typus: Carduo carpetani-Onopordetum acanthii Rivas-Martínez, Penas & T.E. Díaz 1986 (30.5.1.).

Characteristic species: *Carduus carpetanus*, *Carduus gayanus*, *Carduus platypus*.

30.5.1. *Carduo carpetani-Onopordetum acanthii* Rivas-Martínez, Penas & T.E. Díaz 1986

30e. CARTHAMETALIA LANATI Brullo in Brullo & Marcano 1985

Nitrophilous ruderal communities composed by perennial to biennial plants in abandoned farmland soils very altered by human activities, with infra-mesomediterranean semiarid-humid bioclimate and Mediterranean distribution.

Typus: Onopordion illyrici Oberdorfer 1954.

Characteristic species: *Atractylis gummifera*, *Carduncellus caeruleus*, *Carduus bourgeanus*, *Carlina corymbosa* subsp. *corymbosa*, *Carthamus lanatus* subsp. *lanatus*, *Centaurea aspera*, *Centaurea collina*, *Cynoglossum cheirifolium*, *Cynoglossum clandestinum*, *Cynoglossum creticum*, *Echium creticum* subsp. *coincyanum*, *Echium tuberculatum*, *Foeniculum vulgare* subsp. *piperitum*, *Reseda barrelieri* subsp. *barrelieri*, *Salvia argentea*, *Scolymus hispanicus*, *Verbascum sinuatum*, *Verbascum thapsus* subsp. *thapsus*.

30.6. Onopordion castellani Br.-Bl. & O. Bolòs 1958 corr. Rivas-Martínez, T.E. Díaz, Fernández-González, Izco, Loidi, Lousã & Penas 2002 [*Onopordion nervosi* Br.-Bl. & O. Bolòs 1958 corr. Rivas-Martínez 1975]

Ruderal indifferent edaphic thistles communities, in abandoned fields and crops on amended deep soils, with shortage of time hydromorphy. In infra-supramediterranean bioclimate, with Mediterranean West Iberian, Baetic and Maghrebi distribution.

Typus: Onopordetum castellani Br.-Bl. & O. Bolòs 1958 corr. Rivas-Martínez, T.E. Díaz, Fernández-González, Izco, Loidi, Lousã & Penas 2002.

Characteristic species: *Carduus broteroi*, *Carthamus lanatus* subsp. *baeticus*, *Cynara humilis*, *Cynara tournefortii*, *Daucus maximus*, *Echinops strigosus*, *Echium boissieri*, *Echium creticum* subsp. *algarbiensis*, *Notobasis syriaca*, *Onopordum macroacanthum*, *Onopordum nervosum* subsp. *nervosum*, *Scolymus maculatus*.

30.6.1. *Carlino hispanicae-Carthametum lanati* Ladero, F. Navarro & C. J. Valle 1983 corr. Rivas-Martínez, T.E. Díaz, Fernández-González, Izco, Loidi, Lousã & Penas 2002 [*Carlino corymbosae-Carthametum lanati* Ladero, F. Navarro & C. J. Valle 1983]

30.6.2. *Carthamo lanati-Onopordetum macracanthi* Ladero, M.T. Santos, J.L. Pérez & Amor in M.T. Santos & Ladero 1989

30.6.3. *Galactito tomentosae-Cynaretum humilis* Rivas Goday 1964 nom. inv. [*Bourgaeo humilis-Galactitetum tomentosae* Rivas Goday 1964]

30.6.4. *Notobasio syriacae-Scolymetum maculati* Rivas Goday ex Ladero, Socorro, Molero, M. López, Zafra, Marín, Hurtado & Pérez-Raya 1981

30.7. Urtico piluliferae-Silybion mariani Sissingh ex Br.-Bl. & 1958 nom. invers. [*Silybo-Urticion* Sissingh ex Br.-Bl. & O. Bolòs 1958]

Ruderal nitrophilous communities that grows in early spring, formed by large thistles, typical of deep, well aerated and perturbed soils, indifferently to the chemical nature of the substrate, although requiring some moisture in the soil. Mediterranean, Madeiran and Canarian distribution.

Typus: Urtico piluliferae-Silybetum mariani Br.-Bl. in Br.-Bl., Gajweski, Wraber & Wallas 1936.

Characteristic species: *Cynara cardunculus*, *Oxalis articulata*, *Silybum marianum*.

30.7.1. *Carduo bourgeani-Silybetum mariani* Rivas-Martínez ex Rivas-Martínez, Costa & Loidi 1992

30.7.2. *Scolymo maculati-Cynaretum ferocissimae* Wildpret, Del Arco & García Gallo 1989

30.8. Bromo madritensis-Piptatherion miliacei O. Bolòs 1970 nom. mut. [*Bromo-Oryzopsis miliaceae* O. Bolòs 1970; *Hyperrico perforati-Ferulion communis* Vicente & Galán in Acta Bot. Malacitana 33: 179, 2008 (syntax. syn.)]

Subnitrophilous communities occupying roadsides, debris, sand dunes and abandoned farmland, rich in chamaephytes and hemicryptophytes. Infra-mesomediterranean, with Mediterranean, Madeiran and Canarian distribution.

Typus: Dittrichio viscosae-Piptatheretum miliacei A. & O. Bolòs ex O. Bolòs 1957 nom. mut. (30.8.3.).

Characteristic species: *Centaurea aspera* subsp. *stenophylla*, *Dittrichia viscosa* subsp. *revoluta*, *Dittri-*

chia viscosa subsp. *viscosa*, *Piptatherum miliaceum* subsp. *miliaceum*, *Piptatherum miliaceum* subsp. *thomasi*, *Scabiosa atropurpureae*, *Verbascum litigiosum*.

30.8.1. *Feruletum communis* Vicente & Galán in Acta Bot. Malacitana 33: 177, 2008

30.8.2. *Dittrichietum revolutae* O. Bolòs ex Rivas-Martínez 2002 nom mut.

[*Inuletum revolutae* O. Bolòs ex Rivas-Martínez 2002]

30.8.3. *Dittrichio viscosae-Piptatheretum miliacei* A. & O. Bolòs ex O. Bolòs 1957 nom. mut.

[*Inulo viscosae-Oryzopsietum miliacei* O. Bolòs 1957]

30.8.4. *Piptathero miliacei-Foeniculum vulgare* Rivas-Martínez, Wildpret, Del Arco, O. Rodríguez, Pérez de Paz, García Gallo, Acebes, T.E Díaz & Fernández-González 1993

30.8.5. *Verbascum litigiosi-Ononidetum ramosissimae* Galán, I. Sánchez & Vicente 1997

31. *EPILOBIETEA ANGUSTIFOLII* Tüxen & Preising ex von Rochow 1951

Perennial herbaceous vegetation, formed by hemicryptophytes, often tall herbs, on rich soils in nitrogen compounds due to the rapid decomposition of organic matter, usually from forestry. These communities develop in nitrophilous amended fringes, in woodland glades where the forest has been destroyed or cleared, in scrubland, and in burned forests. Usually they are transitory formations which represent the beginning of secondary succession (regeneration) after a severe disturbance that originated the clearings in the forest ecosystem. Holarctic distribution.

Typus: *Atropetalia belladonae* Vlieger 1937 (31a.).

Characteristic species: *Asphodelus arrondeaui*, *Epilobium angustifolium*, *Fragaria vesca*, *Myosotis sylvatica*, *Verbascum thapsus* subsp. *thapsus*.

31a. *ATROPETALIA BELLADONAE* Vlieger 1937

Single order in Europe.

Typus: *Atropion belladonae* Br.-Bl. ex Aichinger 1933.

31.1. *Carici piluliferae-Epilobion angustifolii* Tüxen ex von Rochow 1951

Tall herb communities, on fresh acidic soils rich in organic matter, in fringes of evergreen or deciduous forests and roadsides more or less shadowy. Eurosiberian distribution.

Typus: *Epilobio angustifolii-Senecionetum sylvaticae* Tüxen 1950.

Characteristic species: *Asphodelus lusitanicus* var. *ovoides*, *Bromus ramosus*, *Digitalis purpurea* subsp. *purpurea*, *Iris boissieri*, *Senecio sylvaticus*.

31.1.1. *Asphodelo arrondeaui-Epilobietum angustifolii* Izco, J. Guitián & Amigo 1986 corr. Izco & Amigo 2001

31.1.2. *Simethido mattiazi-Asphodeletum ovoidei* Bellot ex Izco & Amigo 2001

32. *ORYZETEA SATIVAE* Miyawaki 1960

Weed communities of rice fields, with predominance of therophytes and hemicryptophytes, in tropical, Mediterranean and temperate bioclimate with hot summers. Cosmopolitan distribution.

Typus: *Cypero difformis-Echinochloetalia oryzoides* O. Bolòs & Masclans 1955 (32a.).

Characteristic species: *Schoenoplectus supinus*.

32a. *CYPERO DIFFORMIS-ECHINOCHLOETALIA ORYZOIDES* O. Bolòs & Masclans 1955

Mediterranean communities.

Typus: *Oryzo sativae-Echinochloion oryzoidis* O. Bolòs & Masclans 1955 (32.1.).

32.1. *Oryzo sativae-Echinochloion oryzoidis* O. Bolòs & Masclans 1955

Single order.

Typus *Oryzo sativae-Echinochloetum crus-galli* Soó ex Ubrizsy 1948 (32.1.1.).

Characteristic species: *Ammannia coccinea*, *Cyperus difformis*, *Echinochloa crus-galli* subsp. *hispidula*, *Echinochloa oryzoides* subsp. *oryzicola*, *Echinochloa oryzoides* subsp. *oryzoides*, *Rotala indica*, *Schoenoplectus mucronatus*.

32.1.1. *Oryzo sativae-Echinochloetum crus-galli* Soó ex Ubrizsy 1948

[*Cypero difformis-Ammannietum coccineae* O. Bolòs & Masclans 1955]

33. *PEGANO-SALSOLETEA* Br.-Bl. & O. Bolòs 1958

Nitrophilous or halo-nitrophilous dwarf scrubs communities, formed by succulent chamaephytes and nanophanerophytes, including tropical alien shrubs. Distribution Mediterranean, Irano-Turanic and Saharo-Northern Arabic, in infra-oromediterranean belt, Mediterranean desertic, xeric and pluviseasonal bioclimate.

Typus: *Salsolo vermiculatae-Peganetalia harmalae* Br.-Bl. & O. Bolòs 1954 (33a.).

Characteristic species: *Artemisia campestris* subsp. *glutinosa*, *Ballota hirsuta*, *Fagonia cretica*, *Lycium barbarum*, *Launaea arborescens*, *Lycium europaeum*, *Lycium intricatum*, *Ruta angustifolia*.

33a. *SALSOLO VERMICULATAE-PEGANETALIA HARMALAE* Br.-Bl. & O. Bolòs 1954

Shrub nitrophilous and halo-nitrophilous communities, infra-supramediterranean, arid dry, Mediterranean distribution.

Typus: *Salsolo vermiculatae-Peganion harmalae* Br.-Bl. & O. Bolòs 1954.

Characteristic species: *Artemisia arborescens*, *Atriplex halimus*, *Lavatera arborea*, *Mercurialis tomentosa*, *Plumbago europaea*, *Salsola vermiculata* subsp. *vermiculata*, *Solanum linnaeanum*, *Withania frutescens*.

33.1. *Salsolo oppositifoliae-Suaedion pruinosa* Rigual 1972

[*Carthamo arborescentis-Salsolion oppositifoliae* Rivas Goday & Rivas-Martínez 1963 nom inval. (art.8)]

Halo-nitrophilous or aero-halines communities growing in deep soils, occasionally with shallow groundwater. They present a thermomediterranean arid to semiarid bioclimate and a Murcian-Almeriense and Gaditan-Algarvian distribution.

Typus: Atriplex glaucae-Suaedetum pruinosa Rigual 1972.

Characteristic species: *Cynomorium coccineum*.

33.1.1. *Cynomorio coccinei-Lycietum intricati* Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa (1990) 2002

[*Salsolo vermiculatae-Lycietum intricati* Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990 non Llorens & Guijarro 1982]

33.1.2. *Frankenio laevis-Salsoletum vermiculatae* J.C. Costa in J.C. Costa, Lousã & Espírito Santo 1997

33b. HELICHRYSO STOECHADIS-SANTOLINETALIA SQUARROSAE Peinado & Martínez-Parras 1984

Shrub communities rich in nitrophilous species of *Santolina* and *Helichrysum* in abandoned agricultural fields, slopes, edges of paths and greatly grazed soils. Western Mediterranean distribution in thermo-oromediterranean dry to wet bioclimate.

Typus: Artemisio glutinosae-Santolinion rosmarinifoliae Costa 1975 (33.2).

Characteristic species: *Helichrysum italicum* subsp. *serotinum*, *Helichrysum stoechas* subsp. *stoechas*, *Plantago sempervirens*, *Ruta montana*, *Sideritis hirsuta* subsp. *hirsuta*, *Thymus mastichina*.

33.2. Artemisio glutinosae-Santolinion rosmarinifoliae Costa 1975

Communities on siliceous deep sandy soils or sandy-loamy.

Typus: Artemisio glutinosae-Santolinetum rosmarinifoliae Costa 1975.

Characteristic species: *Alyssum serpyllifolium* subsp. *lusitanicum*, *Euphorbia matritensis*, *Santolina impressa*, *Santolina rosmarinifolia* subsp. *rosmarinifolia*, *Santolina rosmarinifolia* subsp. *semidentata*.

33.2.1. *Alyssu lusitanici-Santolinetum semidentatae* Aguiar, Penas & Lousã in J.C. Costa, Capelo, Aguiar, Neto, Lousã & Espírito Santo 1997

33.2.2. *Santolinetum impressae* Rivas-Martínez ex Neto, Capelo, J.C. Costa & Lousã 1997 (fig. 28, page 108)

33c. FORSSSKAOLEO ANGUSTIFOLIAE-RUMICETALIA LUNARIAE Rivas-Martínez, Wildpret, Del Arco, Rodríguez, Pérez de Paz, García-Gallo, Acebes, T.E. Díaz & Fernández-González 1993

Nitrophilous shrub communities, infra mesomediterranean, arid to semiarid, Canarian and Madeiran.

Typus: Artemisio thusculae-Rumicion lunariae Rivas-Martínez, Wildpret, Del Arco, Rodríguez, Pérez de Paz, García-Gallo, Acebes, T.E. Díaz & Fernández-González 1993.

Characteristic species: *Atriplex glauca* subsp. *ifniensis* (ter.), *Chenoleoides tomentosa* (ter.), *Lavandula pinata*, *Schizogyne sericea*.

33.3. Argyranthemum suculentum-Calendulion maderensis Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000

Madeiran communities.

Typus: Calendulo maderensis-Suaedetum verae Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 (33.3.1.).

Characteristic species: *Argyranthemum pinnatifidum* subsp. *succulentum*, *Calendula maderensis*.

33.3.1. *Calendulo maderensis-Suaedetum verae* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000

33d. NICOTIANO GLAUCAE-RICINETALIA COMMUNIS Rivas-Martínez, Fernández-González & Loidi 1999

Sub-nitrophilous, nitrophilous and thermophile shrub communities, consisting of rapid growth neophytes with tropical origin, in infra-thermomediterranean, arid to dry bioclimate and Mediterranean and Canarian-Madeiran distribution.

Typus: Nicotiano glauci-Ricinion communis Rivas-Martínez, Fernández-González & Loidi 1999 (33.4.).

33.4. Nicotiano glauci-Ricinion communis Rivas-Martínez, Fernández-González & Loidi 1999

Single order in Portugal.

Typus: Tropaeolo majoris-Ricinetum communis Rivas-Martínez, Wildpret, del Arco, Rodríguez, Pérez de Paz, García-Gallo, Acebes, T.E. Díaz & Fernández-González 1993 (33.4.1.).

Characteristic species: *Nicotiana glauca*, *Ricinus communis*, *Salpichroa origanifolia*, *Tropaeolum majus*.

33.4.1. *Tropaeolo majoris-Ricinetum communis* Rivas-Martínez, Wildpret, del Arco, Rodríguez, Pérez de Paz, García-Gallo, Acebes, T.E. Díaz & Fernández-González 1993

34. POLYGONO-POETEA ANNUAE Rivas-Martínez 1975

Pioneer communities of nitrophilous therophytes, with creeping perennials, adapted to compacted soils due to trampling, mainly in paths of urban and rural areas, cosmopolitan distribution.

Typus: Polygono arenastri-Poetalia annuae Tüxen in Géhu, Richard & Tüxen 1972 corr. Rivas-Martínez, Bascónes, T.E. Díaz, Fernández-González & Loidi 1991 (34a.).

Characteristic species: *Coronopus didymus*, *Cotula australis*, *Gymnostyles stolonifera*, *Polycarpon tetraphyllum*.

34a. POLYGONO ARENASTRI-POETALIA ANNUAE Tüxen in Géhu, Richard & Tüxen 1972 corr. Rivas-Martínez, Bascónes, T.E. Díaz, Fernández-González & Loidi 1991

Holarctic nitrophilous communities, colonizing paths, roads or places subject to soil compaction due to trampling.

Typus: Saginion procumbentis Tüxen & Ohba in Géhu, Richard & Tüxen 1972 (34.1.).

Characteristic species: *Bryum argenteum*, *Plantago coronopus* subsp. *coronopus*, *Poa annua*, *Poa infirma*, *Polygonum arenastrum*, *Polygonum aviculare*, *Sagina apetala*, *Spergularia rubra* var. *rubra*.

34.1. Saginion procumbentis Tüxen & Ohba in Géhu, Richard & Tüxen 1972

Communities of creeping perennial plants in temperate humid biotopes and Mediterranean areas, in semi-shady and wet soils. Displays optimum Eurosiberian but can penetrate the Mediterranean in biotopes with some humidity.

Typus: Bryo argentei-Saginetum procumbentis Diemont, Sissingh & Westhoff 1940 nom. inv. (34.1.1.).

Characteristic species: *Sagina procumbens*.

- 34.1.1. *Bryo argentei-Saginetum procumbentis* Diemont, Sissingh & Westhoff 1940 nom. inv. [*Sagino-Bryetum argentei* Diemont, Sissingh & Westhoff 1940]

34.2. *Matricario-Polygonion arenastri* Rivas-Martínez 1975 corr. Rivas-Martínez, Báscones, T.E. Díaz, Fernández-González & Loidi 1991

Aestival plant communities in temperate bioclimate, in areas subject to heavy trampling, in sandy and loamy soils.

Typus: Polygono arenastri-Matricarietum discoideae Müller ex Oberdorfer 1971 corr. Passarge 1996 nom. inv. (34.2.1.).

Characteristic species: *Eragrostis minor*, *Eragrostis pilosa*, *Lepidium ruderales*, *Matricaria discoidea*.

- 34.2.1. *Polygono arenastri-Matricarietum discoideae* Müller ex Oberdorfer 1971 corr. Passarge 1996 nom. inv. [*Matricario-Polygonetum arenastri* Müller ex Oberdorfer 1971 corr. Passarge 1996]

34.3. *Sclerochloo durae-Coronopodion squamati* Rivas-Martínez 1975

Communities of temperate and Mediterranean clay soils, rich in limestone, very compressed and poorly aired.

Typus: Coronopodo squamati-Sclerochloetum durae Br.-Bl. in Br.-Bl., Gajweski, Wraber & Walas 1936 num. mut.

Characteristic species: *Coronopus squamatus*.

- 34.3.1. *Polycarpo tetraphylli-Coronopodetum squamati* Rivas-Martínez, Wildpret, Del Arco, O. Rodríguez, Pérez de Paz, García Gallo, Acebes, T.E. Díaz & Fernández-González 1993

34.4. *Polycarpion tetraphylli* Rivas-Martínez 1975

Communities of trampled soils, growing in West Mediterranean, that develop in spring and summer in areas with mild to warm winters, and not clayey soils.

Typus: Solivetum stoloniferae Rivas-Martínez 1975 (34.4.3.).

Characteristic species: *Matricaria aurea*, *Crassula tillaea*, *Crepis pusilla*, *Spergularia purpurea*.

- 34.4.1. *Crassulo tillaeae-Saginetum apetalae* Rivas-Martínez 1975
- 34.4.2. *Polycarpo tetraphylli-Cotuletum australis* Wildpret, Pérez de Paz, del Arco & García Gallo 1988
- 34.4.3. *Solivetum stoloniferae* Rivas-Martínez 1975
- 34.3.4. *Spergulario rubrae-Matricarietum aureae* (Rivas Goday 1955) Rivas-Martínez 1975

34.5. *Chamaesycon prostratae* Rivas-Martínez 1976 nom. mut.

[*Euphorbion prostratae* Rivas-Martínez 1976]

Communities with tropical and subtropical neophytes growing in summer in hot Holarctic areas.

Typus: Euphorbietum chamaesyco-prostratae Rivas-Martínez 1976 (34.5.1.).

Characteristic species: *Alternanthera caracasana*, *Chamaesyce canescens*, *Chamaesyce maculata*, *Chamaesyce prostrata*, *Chamaesyce serpens*, *Eleusine indica*, *Eleusine tristachya*.

- 34.5.1. *Euphorbietum chamaesyco-prostratae* Rivas-Martínez 1976
- 34.5.2. *Polycarpo-Alternantheretum* Oberdorfer ex Lohmeyer & Trautmann 1970

35. *STELLARIETEA MEDIAE* Tüxen, Lohmeyer & Preisig ex von Rochow 1951

Nitrophilous or semi-nitrophilous vegetation, consisting on annual ephemeral plants that inhabit in nitrogenous rich matter substrate. Too often occupy disturbed soil in urban and agricultural areas, including fringe of paths and roads, crops, etc. Cosmopolitan distribution except warm tropical territories.

Typus: Chenopodietalia muralis Br.-Bl. in Br.-Bl., Gajweski, Wraber & Walas 1936 em. Rivas-Martínez 1977 (35d.).

Characteristic species: *Ajuga chamaepitys*, *Althea hirsuta*, *Amaranthus retroflexus*, *Ammi majus*, *Anthemis cotula*, *Atriplex patula*, *Bromus hordeaceus*, *Bromus sterilis*, *Bromus tectorum*, *Calendula arvensis*, *Capsella bursa-pastoris*, *Capsella rubella*, *Cardaria draba*, *Cerastium glomeratum*, *Chenopodium album*, *Crepis pulchra*, *Delphinium gracile*, *Delphinium halteratum* subsp. *halteratum*, *Delphinium halteratum* subsp. *verdunense*, *Erodium malacoides*, *Eruca vesicaria* subsp. *sativa*, *Filago pyramidata*, *Holosteum umbellatum* subsp. *umbellatum*, *Matricaria recutita*, *Melilotus segetalis* subsp. *segetalis*, *Mercurialis ambigua*, *Mercurialis annua*, *Muscari comosum*, *Oxalis corniculata*, *Polygonum bellardii*, *Senecio vulgaris*, *Sinapis arvensis*, *Solanum nigrum*, *Sonchus asper* subsp. *asper*, *Sonchus oleraceus*, *Stachys ocymastrum*, *Stellaria media*, *Thlaspi perfoliatum*, *Valerianella locusta*, *Veronica arvensis*, *Viola arvensis* subsp. *arvensis*.

35a. *SECALINO-STELLARIENEA MEDIAE* Rivas Goday 1964

Cultivated field weeds vegetation.

Typus: Centaureetalia cyani Tüxen ex von Rochow 1951 (35a.).

Characteristic species: *Anagallis arvensis*, *Anagallis foemina*, *Arabidopsis thaliana*, *Camelina microcarpa*, *Coleostephus myconis*, *Fallopia convolvulus*, *Fumaria muralis*, *Galeopsis tetrahit*, *Glaucium corniculatum*, *Lamium amplexicaule*, *Lamium purpureum*, *Lathyrus aphaca*, *Lathyrus cicera*, *Papaver hybridum*, *Papaver somniferum* subsp. *setigerum*, *Raphanus raphanistrum*, *Vicia angustifolia*, *Vicia sativa*, *Vicia villosa*.

35a. *CENTAUREETALIA CYANI* Tüxen ex von Rochow 1951

Weed communities of winter-spring crops, especially cereal, in soils rich in bases (neutral-alkaline), thermomesomediterranean.

Typus: Caucalidion platycarpae Tüxen ex Von Rochow 1951 num. mut.

Characteristic species: *Agrostemma githago*, *Alopecurus myosuroides*, *Asperula arvensis*, *Avena fatua*, *Buglossoides arvensis* subsp. *arvensis*, *Centaurea cyanus*, *Galium tricorntum*, *Hypocoum imberbe*, *Kickxia elatine*, *Kickxia spuria* subsp. *integrifolia*,

Legousia hybrida, *Neslia apiculata*, *Nigella damascena*, *Nigella gallica*, *Papaver dubium*, *Papaver rhoeas*, *Ranunculus arvensis*, *Rapistrum rugosum* subsp. *linnaeanum*, *Rapistrum rugosum* subsp. *rugosum*, *Scandix pecten-veneris*, *Sherardia arvensis*, *Silene muscipula*, *Silene nocturna*, *Silene rubella*, *Turgenia latifolia*, *Vaccaria hispanica*, *Valerianella coronata*, *Vicia hirsuta*.

35.1. *Roemerion hybridae* Br.-Bl. ex Rivas-Martínez, Fernández-González & Loidi 1999

Communities of spring weed of crops, which thrive in clay soils rich in limestone or bases, thermo-mesomediterranean, semi-arid to sub-humid, typical of Tingitanan Province (North Africa), Iberian Peninsula and south-eastern France.

Typus: *Caucalido platycarpae-Scandicetum pecten-veneris* Libbert ex Tüxen 1937.

Characteristic species: *Adonis microcarpa*, *Anchusa italica*, *Avena sterilis* subsp. *ludoviciana*, *Bifora testiculata*, *Biscutella auriculata*, *Coronilla scorpioides*, *Delphinium pentagynum*, *Galium verrucosum*, *Hypocoum procumbens*, *Lathyrus ochrus*, *Linaria hirta*, *Nigella atlantica*, *Papaver pinnatifidum*, *Sisymbrium crassifolium*, *Valerianella echinata*, *Valerianella pumila*.

35.1.1. *Linario hirtae-Galietum tricornuti* Rivas Goday 1964

35.1.2. *Valerianello discoideae-Bupleuretum lancifolii* Rivas Goday 1964

35.2. *Ridolfion segeti* Nègre ex El Antri in Rivas-Martínez, Fernández-González & Loidi 1999

Arable spring communities characteristic of vertisols, in thermo-mesomediterranean lower dry sub-humid bioclimate and with a southern Iberian Peninsula to Mauritania distribution.

Typus: *Ridolfio segeti-Capnophylletum peregrini* Guinochet 1978 (35.2.2.).

Characteristic species: *Adonis annua*, *Bupleurum lancifolium*, *Capnophyllum peregrinum*, *Nigella papillosa*, *Phalaris paradoxa*, *Ridolfia segetum*, *Silene stricta*.

35.2.1. *Bupleuro lancifolii-Ridolfietum segeti* Peinado, Martínez-Parras & Alcaraz 1989

35.2.2. *Ridolfio segeti-Capnophylletum peregrini* Guinochet 1978

35b. *APERETALIA SPICAE-VENTI* J. Tüxen & Tüxen in Malato-Beliz, J. Tüxen & Tüxen 1960

Winter and spring crops communities, on sandy and sandy-loamy soils poor in bases, with Eurosiberian and Mediterranean distribution.

Typus: *Scleranthion annui* (Kruseman & Vlieger 1939) Sissingh in Westhoff, Dijk & Passchier 1946 (35.3.).

35.3. *Scleranthion annui* (Kruseman & Vlieger 1939) Sissingh in Westhoff, Dijk & Passchier 1946

Eurosiberian and Mediterranean weed communities on poor soils in bases.

Typus: *Aphanes arvensis-Matricarietum chamomillae* Tüxen 1937 num. mut.

Characteristic species: *Anthemis arvensis*, *Aphanes arvensis*, *Arnoseris minima*, *Avena strigosa*, *Bro-mus secalinus*, *Chamaemelum mixtum*, *Odontites verna*, *Papaver argemone*, *Scleranthus annuus*, *Spergula arvensis*, *Spergularia segetalis*, *Veronica triphyllos*.

35.3a. *Scleranthion annui* Kruseman & Vlieger 1939

[*Aperenion spicae-venti* Oberdorfer 1983]

Weed associations on acid soils Eurosiberian northern Iberian Peninsula.

Typus: *Aphanes arvensis-Matricarietum chamomillae* Tüxen 1937 num. mut.

Characteristic species: *Linaria amethystea*.

35.3.1. *Chrysanthemo segeti-Raphanetum microcarpi* Bellot 1951

35.3.2. *Miboro minimae-Arabidopsietum thalianae* Rivas-Martínez & C. Rivas-Martínez 1970

35.3b. *Arnoseridenion minimae* (Malato-Beliz, J. Tüxen & Tüxen 1960) Oberdorfer 1983

Weed associations on very oligotrophic sandy soils of the central, western and northern Iberia Peninsula.

Typus: *Sclerantho annui-Arnoseridetum minimae* Tüxen 1937.

Characteristic species: *Linaria ricardoi*, *Myosotis discolor* subsp. *discolor*.

35.3.3. *Catapodietum patentis* Br.-Bl., P. Silva, Rozeira & Fontes 1952

35.3.4. *Linario elegantis-Anthoxantheum aristati* Tüxen & Oberdorfer 1958

35.3.5. *Rumici bucephalophori-Arnoseridetum minimae* Malato-Beliz ex A. Valdés 1985

35.3c. *Spergulo pentandrae-Arabidopsienion thalianae* Rivas Goday 1964

Communities on siliceous sandy-loamy mesotrophic soils, in the centre, west and south of the Iberian Peninsula.

Typus: *Chrysanthemo myconis-Anthemidetum fuscatae* Rivas Goday 1964 (35.3.6.).

Characteristic species: *Chamaemelum fuscatum*, *Mibora minima*, *Spergula pentandra*.

35.3.6. *Chrysanthemo myconis-Anthemidetum fuscatae* Rivas Goday 1964

35.3.7. *Linario amethysteae-Calenduletum arvensis* Izco 1982

35.3.8. *Raphano raphanistri-Diplotaxietum catholicae* Vicente & Galán in Acta Bot. Malacitana 33: 179, 2008

35c. *SOLANO NIGRI-POLYGONETALIA CONVULVULI* (Sissingh in Westhoff, Dijk & Passchier 1946) O. Bolòs 1962

Eurosiberian and Mediterranean weed communities of summer crops.

Typus: *Polygono convolvuli-Chenopodion polyspermi* Koch 1926 em. Oberdorfer 1957 (35.4.).

Characteristic species: *Amaranthus albus*, *Amaranthus cruentus*, *Amaranthus hybridus*, *Ammi visnaga*, *Chrysanthemum segetum*, *Diplotaxis eruroides*, *Era-*

grostis barrelieri, *Fumaria bastardii*, *Fumaria densiflora*, *Misopates orontium*, *Myosotis arvensis*, *Polygonum persicaria*, *Reseda phyteuma*, *Setaria verticillata*, *Setaria viridis*, *Stachys arvensis*, *Veronica persica*, *Veronica polita*, *Xanthium strumarium*.

35.4. *Polygono convolvuli-Chenopodion polyspermi*
Koch 1926

Summer-autumn crops communities, with Atlantic-Central European and Mediterranean distribution.

Typus: *Panico crus-galli-Chenopodietum polyspermi* Kruseman & Vlieger 1939.

Characteristic species: *Anchusa arvensis*, *Chenopodium polyspermum*, *Digitaria ischaemum*, *Digitaria sanguinalis*, *Euphorbia helioscopia*, *Euphorbia pepus*, *Fumaria officinalis*, *Fumaria vaillantii*, *Galinsoga ciliata*, *Galinsoga parviflora*, *Galinsoga quadriradiata*, *Lamium hybridum*, *Oxalis latifolia*, *Setaria pumila*, *Veronica agrestis*, *Veronica hederifolia*.

35.4a. *Eu-Polygono-Chenopodienion polyspermi*
Oberdorfer 1957

Weed communities on rich soil.

Typus: *Panico crus-galli-Chenopodietum polyspermi* Kruseman & Vlieger 1939.

35.4.1. *Fumario capreolatae-Veronicetum persicae* Aedo, Herrera, F. Prieto & T.E. Díaz 1988

35.4.2. *Galinsoga quadriradiatae-Fumarietum lowei* Espírito Santo, J.C. Costa, Jardim & Sequeira in Silva Lusit. 11(2): 242, 2003

35.4.3. *Holosteo umbellati-Veronicetum persicae* Penas, T.E. Díaz, C. Pérez, Puente, M.E. García & Terrón 1988

35.4b. *Digitario ischaemi-Setarienion viridis* (Sis-singh in Westhoff, Dijk & Passchier 1946)
Oberdorfer 1957

Summer crops weed communities on poor sandy soils.
Typus: *Setario viridis-Galinsogetum parviflorae* Tüxen & Becker 1942.

Characteristic species: *Echinochloa colona*, *Echinochloa crus-galli* subsp. *crus-galli*, *Leersia oryzoides*.

35.4.4. *Digitario-Galinsogetum parviflorae* Tüxen & Becker 1942

35.4.5. *Setario glaucae-Echinochloetum colonae* O. Bolòs 1955

35.4.6. *Setario verticillatae-Echinochloetum cruris-galli* Peinado, Bartolomé & Martínez-Parras 1985

35.5. *Diploaxion eruroidis* Br.-Bl. in Br.-Bl., Gajewski, Wraber & Walas 1936

Weed communities of crops (not cereal) and fallow lands, flowering in summer/autumn and with a Mediterranean distribution.

Typus: *Amarantho delilei-Diploaxietum eruroidis* Br.-Bl. in Br.-Bl., Gajewski, Wraber & Walas 1936.

Characteristic species: *Chrozophora tinctoria*, *Cyperus rotundus*, *Diploaxion muralis*, *Dittrichia graveolens*, *Euphorbia segetalis*, *Heliotropium europaeum*, *Kickxia lanigera*, *Mollugo cervina*, *Platycapnos spicata* subsp. *spicata*, *Solanum luteum*,

Solanum villosum, *Tanacetum annuum*, *Tanacetum microphyllum*, *Teucrium spinosum*.

35.5.1. *Chrozophoro-Heliotropietum europaei* Rivas Goday 1964

35.5.2. *Chrozophoro tinctoriae-Teucrietum spinosi* Galán de Mera 1996

35.5.3. *Fedio cornucopiae-Diploaxietum eruroidis* Rivas Goday 1964

35.5.4. *Heliotropio europaei-Amaranthetum albi* Rivas Goday 1964

35.5.5. *Kickxio lanigerae-Tanacetum annui* Galán de Mera 1996

35.6. *Fumarion wirtgenii-agrariae* Brullo in Brullo & Marceno 1985

Thermomediterranean weed associations with spring-time flowering.

Typus: *Fumario densiflorae-Veronicetum hederifoliae* Brull & Marcenó 1985.

Characteristic species: *Fumaria agraria*, *Fumaria parviflora*, *Fumaria wirtgenii*, *Oxalis pes-caprae*.

35.6.1. *Apio leptophyllae-Oxalidetum pes-caprae* Espírito Santo, J.C. Costa, Jardim & Sequeira in Silva Lusit. 11(2): 243, 2003

35.6.2. *Citro-Oxalidetum pedis-caprae* O. Bolòs 1975

35B. *CHENOPODIO-STELLARIENEA* Rivas Goday 1955

Nitrophilous and semi-nitrophilous ruderal and roadside vegetation. With a Mediterranean ecological optimum and cosmopolitan irradiation. Holarctic distribution.

Typus: *Chenopodietalia muralis* Br.-Bl. in Br.-Bl., Gajewski, Wraber & Walas 1936 em. Rivas-Martínez 1977 (35d.).

Characteristic species: *Bidens pilosa*, *Borago officinalis*, *Crepis foetida*, *Erodium moschatum*, *Patellifolia patellaris* (*Beta patellaris*), *Rhagadiolus stellatus* subsp. *stellatus*, *Senecio lividus*.

35d. *CHENOPODIETALIA MURALIS* Br.-Bl. in Br.-Bl., Gajewski, Wraber & Walas 1936 em. Rivas-Martínez 1977

Nitrophilous plant communities, markedly rich in annual cosmopolitan species, common in Mediterranean region, reaching temperate or cold tropical areas, mostly dry to semi-arid, and thermo-supramediterranean.

Typus: *Chenopodion muralis* Br.-Bl. in Br.-Bl., Gajewski, Wraber & Walas 1936 (35.7.).

Characteristic species: *Amaranthus blitoides*, *Amaranthus deflexus*, *Amaranthus graecizans*, *Amaranthus hypochondriacus*, *Atriplex prostrata*, *Atriplex rosea*, *Chenopodium ambrosioides*, *Conyza canadensis*, *Ecballium elaterium*, *Emex spinosa*, *Lamarckia aurea*, *Sisymbrium irio*, *Sisymbrium orientale*, *Urtica urens*.

35.7. *Chenopodion muralis* Br.-Bl. in Br.-Bl., Gajewski, Wraber & Walas 1936

Urban and rural high nitrophilous vegetation, with Mediterranean optimal and Eurosiberian irradiation.

Typus: *Chenopodietum muralis* Br.-Bl. in Br.-Bl., Gajewski, Wraber & Walas 1936 (35.7.1.).

Characteristic species: *Amaranthus muricatus*, *Amaranthus viridis*, *Chenopodium murale*, *Chenopodium opulifolium*, *Chenopodium urbicum*, *Cheno-*

podium vulvaria, *Cnicus benedictus*, *Conyza albida*, *Conyza bonariensis*, *Conyza sumatrensis*, *Datura stramonium*, *Malva nicaeensis*, *Portulaca oleracea*, *Tribulus terrestris*, *Xanthium spinosum*.

35.7a. *Chenopodiion muralis*

Thermo-supramediterranean and submediterranean associations with summer flowering.

Typus: *Chenopodietum muralis* Br.-Bl. in Br.-Bl., Gajewski, Wraber & Walas 1936 (35.7.1.).

35.7.1. *Chenopodietum muralis* Br.-Bl. in Br.-Bl., Gajewski, Wraber & Walas 1936

35.7b. *Malvenion parviflorae* Rivas-Martínez 1978

Thermo-mesomediterranean, semiarid to subhumid associations, that appear after the first autumn or winter rains.

Typus: *Sisymbrio irionis-Malvetum parviflorae* Rivas-Martínez 1978 (35.7.6.).

Characteristic species: *Lavatera cretica*, *Lavatera mauritanica* subsp. *davaei*, *Malva parviflora*, *Sisymbrium erysimoides*, *Sisymbrium runcinatum*, *Urtica portosanctana*.

35.7.2. *Chenopodio muralis-Malvetum parviflorae* Lohmeyer & Trautmann 1970

35.7.3. *Emici spinosae-Malvetum parviflorae* Rivas-Martínez in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980

35.7.4. *Hyosciamo albi-Malvetum parviflorae* (Rivas Goday 1964) Rivas-Martínez 1978

35.7.5. *Malvo parviflorae-Urticetum portosanctanae* Espirito Santo, J.C. Costa, Jardim & Sequeira in Silva Lusit. 11(2): 244, 2003

35.7.6. *Sisymbrio irionis-Malvetum parviflorae* Rivas-Martínez 1978

35.7.7. *Sisymbrio irionis-Lavateretum creticae* (Mateo & M.B. Crespo 1988) Carretero & Aguilera 1995

35.8. *Mesembryanthemion crystallini* Rivas-Martínez, Wildpret, Del Arco, O. Rodríguez, Pérez de Paz, García-Gallo, Acebes, T.E. Díaz & Fernández-González 1993

That grow in rocky places and stirred or altered soils, generally quite ruderal and sometimes enriched in soluble salts, in arid to dry bioclimate, and in Mediterranean, Canarian--Madeiran and Saharo-Arabian areas. In the wettest areas only occurring in coastal stations.

Typus: *Gasouletum crystallino-nodiflori* O. Bolòs 1957.

Characteristic species: *Aizoon canariense*, *Mesembryanthemum crystallinum*, *Mesembryanthemum nodiflorum*, *Patellifolia procumbens*, *Senecio incrassatus*, *Spergularia fallax*.

35.8.1. *Mesembryanthemetum crystallini* Rivas-Martínez, Wildpret, Del Arco, O. Rodríguez, Pérez de Paz, García-Gallo, Acebes, T.E. Díaz & Fernández-González 1993

35.8.2. *Senecio incrassati-Mesembryanthemetum crystallini* Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espirito Santo & Lousã in Silva Lusit. 11 (1): 116, 2003

35.8.3. *Spergulario bocconeii-Mesembryanthemetum nodiflori* J.C. Costa in J.C. Costa, Lousã & Espirito Santo 1996

35e. *THERO-BROMETALIA* (Rivas Goday & Rivas-Martínez ex Esteve 1973) O. Bolòs 1975

[*Brometalia rubenti-tectorum* Rivas-Martínez & Izco 1977]

Semi-nitrophilous annual spring communities, preferentially located in abandoned agricultural fields, in Western Mediterranean territories.

Typus: *Taeniathero-Aegilopion geniculatae* Rivas-Martínez & Izco 1977 (35.11.).

Characteristic species: *Althea longiflora*, *Astragalus hamosus*, *Avena barbata* subsp. *barbata*, *Avena barbata* subsp. *lusitanica*, *Avena sterilis* subsp. *sterilis*, *Bellardia trixago*, *Bromus diandrus*, *Bromus lanceolatus*, *Bromus madritensis*, *Bromus rigidus*, *Bromus rubens*, *Bromus squarrosus*, *Catapodium rigidum* subsp. *rigidum*, *Centaurea melitensis*, *Centaurea pullata*, *Cullen americanum*, *Gastridium phleoides*, *Hedypnois cretica*, *Leontodon salzmannii*, *Lolium rigidum*, *Lotus edulis*, *Lotus ornithopodioides*, *Lupinus angustifolius*, *Lupinus luteus*, *Malva hispanica*, *Matthiola parviflora*, *Medicago orbicularis*, *Medicago rigidula*, *Medicago truncatula*, *Melilotus spicatus*, *Melilotus sulcatus*, *Nonea vesicaria*, *Phalaris brachystachys*, *Phalaris canariensis*, *Phalaris minor*, *Plantago afra*, *Reichardia picroides*, *Scorzonera laciniata*, *Senecio gallicus*, *Silene gallica*, *Thesium humile*, *Trifolium angustifolium*, *Trifolium cherleri*, *Trifolium hirtum*, *Trigonella foenum-graecum*, *Trigonella monspeliaca*, *Trigonella polyceratia*, *Trisetum paniceum*, *Urospermum picroides*, *Vulpia ciliata*.

35.9. *Echio plantaginei-Galactition tomentosae* O. Bolòs & Molinier 1969

Semi-nitrophilous communities with plenty biomass, typical of fallow land and abandoned farmland, on rich mesotrophic soils. Their ecological optimal is in euoceanic thermo-mesomediterranean, mostly subhumid and with rainy winters areas in Western Mediterranean and Canarian-Madeiran.

Typus: *Galactito tomentosae-Vulpietum membranaceae* O. Bolòs & Molinier 1969 corr. O. Bolòs, Molinier & P. Montserrat 1970.

Characteristic species: *Echium plantagineum*, *Galactites tomentosa*, *Gastridium ventricosum*, *Medicago ciliaris*, *Medicago murex*, *Melilotus elegans*, *Melilotus italicus*, *Reichardia intermedia*, *Silene fuscata*, *Silene scabriflora* subsp. *tuberculata*, *Vulpia geniculata*.

35.9.1. *Achyrantho siculae-Bidentetum pilosae* Espirito Santo, J.C. Costa, Jardim & Sequeira in Silva Lusit. 11(2): 245, 2003

35.9.2. *Coleostepho myconis-Galactitetum tomentosae* Izco & Collado 1985

35.9.3. *Galactito tomentosae-Brachypodietum distachyi* Rivas-Martínez, Wildpret, Del Arco, O. Rodríguez, Pérez de Paz, García Gallo, Acebes, T.E. Díaz & Fernández-González 1993

35.9.4. *Rumici angiocarpi-Coleostephetum myconis* Vicente & Galán in Acta Bot. Malacitana 33: 179, 2008
[sensu auct. lus. *Galactito tomentosae-Vulpium membranaceae* non O. Bolòs & Molinier 1969 corr. O. Bolòs, Molinier & P. Montserrat 1970]

35.9.5. *Vicio costei-Echietum plantaginei* Jardim, Sequeira, Espírito Santo, Capelo, Aguiar, Lousã & J.C. Costa in Silva Lusit. 11 (1): 122, 2003

35.10. *Linario polygalifoliae-Vulpium alopecuroris*
Br.-Bl., Rozeira & P. Silva in Br.-Bl., G. Br.-Bl., Rozeira & P. Silva 1972
[*Linario viscosae-Vulpium alopecuroris* Rivas-Martínez & Izco in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980 (syntax. syn.)]

Littoral subnitrophilous and psammophilous communities, thermomediterranean and thermotemperate submediterranean. Cantabrian-Atlantic, Coastal Lusitan-Andalusian, Baetic, Murcian-Almeriense and Tingitanan distribution.

Typus: Scrophulario frutescentis-Vulpium alopecuroris Br.-Bl., Rozeira & P. Silva in Br.-Bl., G. Br.-Bl., Rozeira & P. Silva 1972 (35.10.3.).

Characteristic species: *Avena longiglumis*, *Brassica oxyrrhina*, *Carduus meoanthus*, *Lagurus ovatus*, *Linaria bipunctata* subsp. *glutinosa*, *Linaria viscosa*, *Ononis pinnata*, *Reichardia gaditana*, *Silene longicaulis*, *Vulpia alopecuros*.

35.10.1. *Chamaemelo mixti-Vulpium alopecuroris* Rivas-Martínez in Rivas-Martínez, Costa, Castroviejo & Valdés ex J.C. Costa, Lousã, Capelo, Espírito Santo, Izco & Arsénio 2000

35.10.2. *Linario viscosae-Carduetum meoanthi* Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980

35.10.3. *Scrophulario frutescentis-Vulpium alopecuroris* Br.-Bl., Rozeira & P. Silva in Br.-Bl., G. Br.-Bl., Rozeira & P. Silva 1972

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

Seminitrophilous communities, indifferent to the chemical nature of the substrate and to the degree of trophy. Predominantly composed by small grasses with early summer flowering, in thermo-supramediterranean bioclimate and Western Mediterranean distribution.

Typus: Trifolio cherleri-Taeniatheretum capitis-medusae Rivas-Martínez & Izco 1977 (35.11.6.).

Characteristic species: *Aegilops geniculata*, *Aegilops neglecta*, *Aegilops triuncialis*, *Stipa capensis*, *Taeniatherum caput-medusae*.

35.11.1. *Aegilopo neglectae-Stipetum capensis* M.T. Santos ex Cano, A. García, Torres & Salazar 1998
[*Aegilopo neglectae-Stipetum capensis* M.T. Santos, Ladero & Amor 1989, *Atractylo cancellatae-Stipetum capensis* A. García & Cano 1996]

35.11.2. *Bromo tectorum-Stipetum capensis* Rivas-Martínez & Izco 1977

35.11.3. *Gastridio ventricosi-Trifolietum scabri* Rivas Goday 1964

35.11.4. *Lino stricti-Stipetum capensis* Jardim, Sequeira, Espírito Santo, Capelo, Aguiar, Lousã & J.C. Costa in Silva Lusit. 11 (1): 120, 2003

35.11.5. *Medicagini rigidulae-Aegilopetum geniculatae* Rivas-Martínez & Izco 1977

35.11.6. *Trifolio cherleri-Taeniatheretum capitis-medusae* Rivas-Martínez & Izco 1977

35.12. *Alyso granatensis-Brassicetum barrelieri* Rivas-Martínez & Izco 1977

Mostly semicontinental communities colonizing poor sandy soils in meso-supramediterranean bioclimate and Mediterranean Iberian-Atlantic distribution.

Typus: Coincyo hispidae-Brassicetum barrelieri Rivas-Martínez & Izco 1977 num. mut. (35.12.2.).

Characteristic species: *Alyssum granatense*, *Andryala arenaria*, *Brassica barrelieri*, *Coincyo hispida*, *Coincyo hispida* subsp. *transtagana*, *Sisymbrium contortum*.

35.12.1. *Chamaemeletum mixti* Ruiz & A. Valdés 1987

35.12.2. *Coincyo setigeriae-Brassicetum barrelieri* Rivas-Martínez, Ladero, Belmonte & Sánchez-Mata in Sánchez-Mata 1989

35.12.3. *Coincyo transtaganae-Brassicetum barrelieri* Cano, N. Sánchez & F. Valle 1996

35.13. *Cerintho majoris-Fedion cornucopiae* Rivas-Martínez & Izco ex Peinado, Martínez-Parras & Bartolomé 1986

Vertisols communities in thermomediterranean pluvi-seasonal areas, in the South of the Iberian Peninsula and Maghreb.

Typus: Fedio cornucopiae-Sinapietum mairei Peinado, Martínez-Parras & Bartolomé 1986 corr. Rivas-Martínez, T.E. Díaz, Fernández-González, Izco, Loidi, Lousã & Penas 2002 (35.13.2.).

Characteristic species: *Catananche lutea*, *Cerintho major*, *Convolvulus meoanthus*, *Convolvulus tricolor*, *Fedia cornucopia*, *Fedia scorpioides*, *Glossopappus macrotus*, *Hedysarum coronarium*, *Hedysarum glomeratum*, *Lavatera trimestris*, *Malope trifida*, *Salvia viridis*.

35.13.1. *Convolvulo meoanthi-Hedysaretum coronarii* Peinado, Martínez-Parras & Bartolomé 1986

35.13.2. *Fedio cornucopiae-Sinapietum mairei* Peinado, Martínez-Parras & Bartolomé 1986 corr. Rivas-Martínez, T.E. Díaz, Fernández-González, Izco, Loidi, Lousã & Penas 2002 [*Fedio cornucopiae-Sinapietum albae* Peinado, Martínez-Parras & Bartolomé 1986]

35f. *SISYMBRIETALIA OFFICINALIS* J. Tüxen in Lohmeyer & al. 1962 em. Rivas-Martínez, Bascónes, T.E. Díaz, Fernández-González & Loidi 1991

Order with a wide geographical distribution, formed by semi-nitrophilous communities with spring flowering, that begin to develop after the autumn rains in anthropic areas, such as fringe of paths and roads. The ecological optimal is in the Mediterranean Region, but can also be found in Eurosiberian.

Typus: Sisymbrium officinalis Tüxen, Lohmeyer & Preising in Tüxen 1950 (35.15.).

Characteristic species: *Arctotheca calendula*, *Convolvulus siculus*, *Crepis taraxacifolia*, *Geranium molle*, *Lamarckia aurea*, *Malva sylvestris*, *Medicago polymorpha*, *Rumex pulcher* subsp. *pulcher*, *Sisymbrium officinale*.

35.14. *Hordeion leporini* Br.-Bl. in Br.-Bl., Gajewski, Wraber & Walas 1936 corr. O. Bolòs 1962

Mediterranean roadside vegetation.

Typus: Hordeetum leporini Br.-Bl. in Br.-Bl., Gajewski, Wraber & Walas 1936.

Characteristic species: *Anacyclus clavatus*, *Anacyclus radiatus*, *Asphodelus fistulosus*, *Bromus scoparius*, *Chrysanthemum coronarium* var. *coronarium*, *Chrysanthemum coronarium* var. *discolor*, *Daucus muricatus*, *Diploxixis virgata*, *Erodium cium*, *Hirschfeldia incana*, *Hordeum murinum* subsp. *leporinum*, *Lepidium graminifolium*, *Plantago lagopus*, *Reseda alba* subsp. *alba*, *Rostraria cristata*, *Rumex pulcher* subsp. *woodsii*.

35.14.1. *Anacyclo radiatae-Chrysanthemetum coronarii* (O. Bolòs & Rivas-Martínez in Rivas-Martínez 1978) Cano-Ortiz, Pinto-Gomes, Estebán, Rodríguez-Torres, Goñi, de la Haza, Cano in Acta Bot. Gallica 155 (1): 35, 2009

35.14.2. *Anacyclo radiatae-Hordeetum leporini* O. Bolòs & Rivas-Martínez in Rivas-Martínez 1978

35.14.3. *Anacyclo radiatae-Papaveretum rhoeadis* Cano-Ortiz, Pinto-Gomes, Estebán, Rodríguez-Torres, Goñi, de la Haza, Cano in Acta Bot. Gallica 155 (1): 35, 2009

35.14.4. *Avenulo lusitanicae-Hordeetum leporini* Espírito Santo, J.C. Costa, Jardim & Sequeira in Silva Lusit. 11(2): 247, 2003

35.14.5. *Bromo scoparii-Hordeetum leporini* Rivas-Martínez 1978

35.14.6. *Hordeo leporini-Glossopappetum macroti* Peinado, Martínez-Parras & Bartolomé 1986

35.15. *Sisymbrium officinalis* Tüxen, Lohmeyer & Preising in Tüxen 1950
[inc. *Malvenion neglectae* Gutte 1966]

Eurosiberian roadside vegetation.

Typus: Hordeetum murini Libbert 1933.

Characteristic species: *Hordeum murinum* subsp. *murinum*, *Malva neglecta*.

35.15.1. *Sisymbrio officinalis-Hordeetum murini* Br.-Bl. 1967

35.15.2. *Hyoscyamo nigri-Malvetum neglectae* Aichinger 1933
[*Urtico urentis-Malvetum neglectae* (Knapp 1945) Lohmeyer in Tüxen 1950]

Vb. FRINGE AND MEGAFORBIC VEGETATION

36. *GALIO-URTICETEA* Passarge ex Kopecký 1969

Perennial hemicryptophytes and climbing and tall herbs of nitrified wood fringes and other semi-shaded anthropic biotopes communities. Occur in mesic sites with humid nutrient-rich soils, on the river banks and in swamp areas not subjected to desiccation. Displays Holarctic distribution in temperate, Mediterranean and rainy thermoboreal bioclimate.

Typus: Galio aparines-Alliarietalia petiolatae Görs & Müller 1969 (36a.).

Characteristic species: *Allium victorialis*, *Galium aparine*, *Lamium maculatum*, *Stellaria neglecta*, *Urtica dioica*.

36a. *GALIO APARINES-ALLIARIETALIA PETIOLATAE* Görs & Müller 1969

Nitrophilous perennial vegetation in semi-shadowy fringes of anthropic biotopes on deep soils.

Typus: Galio-Alliarion petiolatae Oberdorfer & Lohmeyer in Oberdorfer, Görs, Korneck, Lohmeyer, Müller, Philippi & Seibert 1967 (36.1.).

Characteristic species: *Alliaria petiolata*, *Anthriscus sylvestris*, *Arabis glabra*, *Conium maculatum*, *Cruciata laevipes*, *Geum urbanum*, *Glechoma hederacea*, *Lapsana communis*.

36.1. *Galio-Alliarion petiolatae* Oberdorfer & Lohmeyer in Oberdorfer, Görs, Korneck, Lohmeyer, Müller, Philippi & Seibert 1967

[*Alliarion petiolatae* Oberdorfer in Hejný in Holub, Moravec & Neuhäusl 1967]

Hemicryptophytic humicolous communities of tall herbs living in wood fringes and on the shadow walls, in thermomediterranean pluviseasonal and thermomesotemperate submediterranean, subhumid to humid bioclimate.

Typus: Alliarion petiolatae-Chaerophylletum temuli Lohmeyer 1949.

Characteristic species: *Geranium robertianum*, *Geranium rubescens*, *Myrrhoides nodosa*, *Silene dioica*, *Smyrniium perfoliatum*, *Torilis japonica*.

36.1a. *Alliarietion petiolatae* Rivas Goday ex Rivas-Martínez, Fernández-González & Loidi 1999

Nitrophilous shadowy communities of deciduous forests, meso-supratemperate and supramediterranean with warm summers, Eurosiberian and Mediterranean distribution.

Typus: Alliarion petiolatae-Chaerophylletum temuli Lohmeyer 1949.

Characteristic species: *Chaerophyllum temulum*, *Pentaglottis sempervirens*.

36.1.1. *Geranio robertiani-Caryolophetum sempervirentis* Izco, Guitián & Amigo 1986

36.1.2. *Myrrhoidi nodosae-Alliarietum petiolatae* Rivas-Martínez & Mayor ex Fuente 1986

36.1.3. *Pentaglottido sempervirentis-Scrophularietum reuteri* Rivas-Martínez 1981 corr. Rivas-Martínez, Fernández-González & Sánchez-Mata 1986

[*Pentaglottido sempervirentis-Scrophularietum herminii* Rivas-Martínez 1981]

36.1b. *Smyrniion olusatri* Rivas Goday ex Rivas-Martínez, Fernández-González & Loidi 1999

Tall herb communities in shadowy fringes of forests, slopes and shadowy rocks, thermo-mesomediterranean and thermo-mesotemperate submediterranean, Mediterranean and Cantabrian-Atlantic distribution.

Typus: *Chelidonio majoris-Smyrniotum olusatri* Amigo & Romero 1997 (36.1.5.).

Characteristic species: *Allium triquetrum* *Kundmannia sicula*, *Scrophularia grandiflora*, *Scrophularia peregrina*, *Smyrniium olusatrium*, *Tradescantia fluminensis*, *Urtica membranacea*.

36.1.4. *Allio triquetri-Urticetum membranaceae* P. Alves, Honrado & B. Caldas in *Studia Bot.* 22: 19, 2003

36.1.5. *Chelidonio majoris-Smyrniotum olusatri* Amigo & Romero 1997

36.1.6. *Smyrniio olusatri-Scrophularietum grandiflorae* C. Lopes, Pinto-Gomes, Lousã, Ladero & J.C. Costa ass. nova hoc loco
[*Scrophulario grandiflorae-Smyrniotum olusatri* C. Lopes 2001 nom. inval. (art. 1)]

36.1.7. *Urtico membranaceae-Smyrniotum olusatri* A. & O. Bolòs in O. Bolòs & Molinier 1958

36.2. *Balloto-Conion maculati* Brullo in Brullo & Marcenó 1985

[*Sambucion ebuli* (O. Bolòs & Vigo ex Rivas-Martínez, Báscones, T.E. Díaz, Fernández-González & Loidi 1991) Rivas-Martínez & Costa 1998]

Tall herbs of forest fringes in wet semi-shadowy anthropic biotopes on deep soils. Mediterranean and submediterranean distribution.

Typus: *Urtico dioicae-Sambucetum ebuli* (Br.-Bl. in Br.-Bl., Gajewski, Wraber & Walas 1936) Br.-Bl. in Br.-Bl., Roussine & Nègre 1952 (36.2.2.).

Characteristic species: *Asphodelus lusitanicus* var. *lusitanicus*, *Ballota nigra* subsp. *foetida*, *Dipsacus ful-lonum*, *Magydaris panacifolia*, *Sambucus ebulus*.

36.2.1. *Galio aparines-Conietum maculati* Rivas-Martínez ex G. López 1978

36.2.2. *Urtico dioicae-Sambucetum ebuli* (Br.-Bl. in Br.-Bl., Gajewski, Wraber & Walas 1936) Br.-Bl. in Br.-Bl., Roussine & Nègre 1952

36b. *CALYSTEGIETALIA SEPIUM* Tüxen 1950 nom. mut.

[*Convolvuletalia sepium* Tüxen 1950]

Nitrophilous perennial vegetation of tall herbs, on hydromorphic soils, usually wetted (margins of stagnant waters or slow streams), with predominance of hemi-cryptophytes helophytes and scandent plants. Ecological optimal in the Eurosiberian Region, still reaching some rivers in the Mediterranean Region.

Typus: *Calystegion sepium* Tüxen ex Oberdorfer 1957 (36.3.).

Characteristic species: *Anthoxanthum amarum*, *Cucubalus baccifer*, *Epilobium hirsutum*, *Epilobium par-viflorum*, *Pulicaria dysenterica* var. *dysenterica*, *Scrophularia auriculata*.

36.3. *Calystegion sepium* Tüxen ex Oberdorfer 1957
[*Convolvulion sepium* Tüxen ex Oberdorfer 1957, *Senecionion fluviatilis* Tüxen 1950 (art.8)]

Communities rich in tall herbs and perennial climber, that colonize riparian environments, and moist disturbed soils. Holarctic distribution.

Typus: *Cuscuto europaea-Convolvuletum sepium* Tüxen 1950.

Characteristic species: *Arundo donax*, *Calystegia sepium*, *Calystegia sylvatica*, *Cynanchum acutum*, *Myosoton aquaticum*.

36.3.1. *Arundini donacis-Convolvuletum sepium* Tüxen & Oberdorfer ex O. Bolòs 1962

36.3.2. *Scrophulario auriculatae-Epilobietum hirsutae* Rios & Alcaraz in Rios 1996 corr. Rivas-Martínez et al. 2002

36.4. *Filipendulion ulmariae* Segal 1966

Plant communities dominated by hygrophilous and sub-nitrophilous tall grass plants (large-sized) growing on riverbanks with meso-eutrophic waters rich in nutrients. Mediterranean and Eurosiberian distribution.

Typus: *Euphorbio hirsutae-Filipendulum ulmariae* Sougnez 1957.

Characteristic species: *Angelica major*, *Angelica sylvestris*, *Filipendula ulmaria*, *Lysimachia vulgaris*, *Stachys palustris*.

36.4.1. *Allio scorzonrifolii-Angelicetum laevis* P. Alves, Lomba, S. Ortiz, B. Caldas, Honrado in *Silva Lusit.* 14 (2): 276, 2006

36.4.2. *Angelico sylvestris-Filipendulum ulmariae* Sánchez-Mata & Fernández-González in Sánchez-Mata 1989

36.5. *Bromo ramosi-Eupatorion cannabini* O. Bolòs & Masalles in O. Bolòs 1983

Sub-nitrophilous hygrophilic tall herb raised almost no creepers communities, in riverbanks, wet meadows and forests. Eurosiberian and Northern Mediterranean distribution in meso-supratemperate, thermoboreal and supramediterranean bioclimate.

Typus: *Sileno albae-Eupatorietum cannabini* O. Bolòs 1962.

Characteristic species: *Eupatorium cannabinum*, *Paradisea lusitanica*, *Scrophularia balbisii* subsp. *balbisii*.

36.5.1. *Cirsio palustris-Paradiseetum lusitanicae* P. Alves, Lomba, S. Ortiz, B. Caldas, Honrado in *Silva Lusit.* 14 (2): 276, 2007

36.5.2. *Picrido hieracioidis-Eupatorietum cannabini* Loidi & C. Navarro 1988

36.6. *Ageratino adenophorae-Ipomaeion acuminatae* Espírito Santo, J.C. Costa, Jardim & Sequeira 2004 nom. invers.

[*Ipomaeo acuminatae-Ageratinion adenophorae* Espírito Santo, J.C. Costa, Jardim & Sequeira in *Silva Lusit.* 11 (2): 248, 2004]

Semi-nitrophilous perennial communities, formed by large-leaved shrubs and tropical scandent neophytes. Madeiran and Canarian distribution.

Typus: *Rubo ulmifolii-Ageratinetum adenophorae* Rivas-Martínez, Wildpret, Del Arco, Rodriguez, Pérez

de Paz, Garcia-Gallo, Acebes, T.E. Díaz & Fernández-González ex Espírito Santo, J.C. Costa, Jardim & Sequeira in Silva Lusit. 11(2): 249, 2004 (36.6.1.).

Characteristic species: *Ageratina adenophora*, *Ageratina riparia*, *Anredera cordifolia*, *Asparagus asparagoides*, *Cardiospermum grandiflorum*, *Crocasmia x crocosmiflora*, *Ipomaea acuminata*, *Lantana camara*, *Solanum mauritianum*.

36.6.1. *Rubo ulmifolii-Ageratinetum adenophorae* Rivas-Martínez, Wildpret, Del Arco, Rodríguez, Pérez de Paz, Garcia-Gallo, Acebes, T.E. Díaz & Fernández-González ex Espírito Santo, J.C. Costa, Jardim & Sequeira in Silva Lusit. 11(2): 249, 2004

[*Bidentis pilosi-Ageratinetum adenophorae* Rivas-Martínez, Wildpret, Del Arco, Rodríguez, Pérez de Paz, Garcia-Gallo, Acebes, T.E. Díaz & Fernández-González 1993 nom. inval. (art. 3b)]

36.6.2. *Solano mauritiani-Ipomaeetum acuminatae* J.C. Costa, Capelo, Jardim, Sequeira & Rivas-Martínez in Silva Lusit. 13 (1): 132, 2005 [Community of *Solanum mauritianum*]

37. *CARDAMINETEA HIRSUTAE* Géhu 1999

[*Geranio purpurei-Cardaminetalia hirsutae* Rivas-Martínez, Fernández González & Loidi (1999) 2002]

Ephemeral annual shadowy nitrophilous communities that develops in spring and summer inside and on the fringes of forests and thickets on slightly nitrified and semi-shady habitats, on rich organic soils. Holarctic distribution in South Europe and Maghrebi, in Mediterranean, submediterranean and temperate oceanic bioclimate.

Typus: *Geranio purpurei-Cardaminetalia hirsutae* Brullo in Brullo & Marceno 1985 (37a.).

Characteristic species: *Anthriscus caucalis*, *Cardamine hirsuta*, *Centranthus calcitrapae*, *Draba muralis*, *Fumaria capreolata*, *Galium spurium*, *Geranium dissectum*, *Geranium purpureum*, *Geranium rotundifolium*, *Ranunculus parviflorus*, *Torilis arvensis* subsp. *neglecta*, *Torilis leptophylla*, *Torilis nodosa*, *Veronica cymbalaria*.

37a. *GERANIO PURPUREI-CARDAMINETALIA HIRSUTAE* Brullo in Brullo & Marceno 1985

Single order.

Typus: *Geranio purpurei-Torilidion neglectae* Lohmeyer & Trautmann 1970 corr. Lohmeyer 1975 (37.1.).

Characteristic species: *Rhagadiolus edulis*.

37.1. *Geranio purpurei-Torilidion neglectae* Lohmeyer & Trautmann 1970 corr. Lohmeyer 1975

Slightly nitrified semi-shaded fringe associations of forest or walls and rocks occasionally visited by man or animals, infra-thermomediterranean in the Canary and Madeira islands.

Typus: *Galio aparines-Torilidion neglectae* Lohmeyer & Trautmann 1970 (37.1.1.).

Characteristic species: *Drusa glandulosa*, *Myosotis discolor* subsp. *canariensis*, *Parietaria debilis*.

37.1.1. *Galio aparines-Torilidion neglectae* Lohmeyer & Trautmann 1970

37.2. *Geranio pusilli-Anthriscion caucalidis* Rivas-Martínez 1978

Small therophytes communities consistency tender, fleeting and spring phenology. They grow in the shadowy habitats inside forest, thickets or near walls with residues accumulation. Meso-supramediterranean and infra to mesotemperate. Cantabrian-Atlantic, Western Mediterranean, Canarian and Madeiran distribution.

Typus: *Galio aparinellae-Anthriscetum caucalidis* Rivas-Martínez 1978 (37.2.2.).

Characteristic species: *Galium murale*, *Geranium columbinum*, *Geranium lucidum*, *Geranium pusillum*, *Myosotis ramosissima* subsp. *ramosissima*, *Odontites holliana*, *Torilis elongata*, *Valantia muralis*, *Vicia capreolata*.

37.2.1. *Cardamino hirsutae-Myosotidetum ramosissimae* C. Lopes, Pinto-Gomes, Lousã & Ladero ass. nova hoc loco

[*Cardamino hirsutae-Myosotidetum ramosissimae* C. Lopes 2001 nom. inval. (art.1)]

37.2.2. *Galio aparinellae-Anthriscetum caucalidis* Rivas-Martínez 1978

37.2.3. *Lamio bifidi-Anthriscetum caucalidis* Ladero, Fuertes & J.L. Pérez 1980

37.2.4. *Urtico membranaceae-Anthriscetum caucalidis* Rivas-Martínez & Costa in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980 nom. mut.

[*Urtico dubiae-Anthriscetum caucalidis* Rivas-Martínez & Costa in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980]

37.2.5. *Vicio capreolatae-Odontitetum hollianae* Capelo, J.C. Costa, Jardim, Sequeira & Rivas-Martínez in Silva Lusit. 11(2): 259, 2003

37.3. *Parietarion lusitanico-mauritanicae* Rivas-Martínez & Cantó 2002

Slightly nitrified semi-shaded fringe communities, thermo-mesomediterranean, in the Western Mediterranean.

Typus: *Anogrammo leptophyllae-Parietarietum lusitanicae* Rivas-Martínez & Ladero in Rivas-Martínez 1978 (37.3.1.).

Characteristic species: *Ceratocarpus heterocarpa*, *Galium minutulum*, *Mercurialis elliptica*, *Parietaria lusitanica*, *Parietaria mauritanica*, *Theligonum cynocrambe*.

37.3.1. *Anogrammo leptophyllae-Parietarietum lusitanicae* Rivas-Martínez & Ladero in Rivas-Martínez 1978

37.3.2. *Geranio purpurei-Galietum minutuli* Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980

37.3.3. *Geranio rotundifolii-Theligonetum cynocrambes* Rivas-Martínez & Malato-Beliz in Rivas-Martínez 1978 corr. Rivas-Martínez, T.E. Díaz, Fernández González, Izo, Loidi, Lousã & Penas 2002

[*Geranio pusilli-Theligonetum cynocrambes* Rivas-Martínez & Malato-Beliz in Rivas-Martínez 1978]

37.3.4. *Torilido nodosae-Parietarietum mauritanicae* Rivas-Martínez 1978

38. TRIFOLIO MEDII-GERANIETEA SANGUINEI Müller 1962

Semi-shaded humicolous herbaceous perennial communities of external fringe of woodlands and their pre-forestry mantles, in thermo to supratemperate and thermo to supramediterranean pluviseasonal bioclimate of the Eurosiberian and the Mediterranean regions.

Typus: *Origanetalia vulgaris* Müller 1962 (38a.).

Characteristic species: *Agrimonia eupatoria*, *Allium oleraceum*, *Aquilegia vulgaris* subsp. *dichroa*, *Aquilegia vulgaris* subsp. *hispanica*, *Astragalus glycyphyllos*, *Calamintha nepeta* subsp. *nepeta*, *Campanula rapunculoides*, *Carex muricata* subsp. *lamprocarpa*, *Clinopodium vulgare* subsp. *vulgare*, *Cruciata glabra*, *Dactylorhiza insularis*, *Dianthus armeria*, *Inula conyza*, *Inula salicina*, *Lathyrus latifolius*, *Lathyrus sylvestris*, *Melampyrum pratense*, *Lithospermum officinale*, *Melampyrum pratense*, *Origanum vulgare*, *Silene latifolia*, *Silene nutans*, *Tanacetum corymbosum*, *Thalictrum minus* subsp. *majus*, *Trifolium medium*, *Trifolium ochroleucon*, *Vicia cracca*, *Vicia orobus*, *Vicia sepium*, *Vicia tenuifolia*.

38a. ORIGANETALIA VULGARIS Müller 1962

[*Melampyro-Holcetalia* Passarge 1979]

Single order in Iberian Peninsula.

Typus: *Trifolium medii* Müller 1962.

Characteristic species: *Agrimonia procera*, *Carex divulsa* subsp. *divulsa*, *Carex divulsa* subsp. *leersii*, *Geranium sanguineum*, *Veronica chamaedrys*.

38.1. Linarion triornithophorae Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas 1984

Silicolous communities, thermo to supratemperate and meso-supramediterranean, Cantabrian-Atlantic and southern Atlantic-European.

Typus: *Omphalodo nitidae-Linarietum triornithophorae* Rivas-Martínez in Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas 1984 (38.1.3.).

Characteristic species: *Arabis juressi*, *Conopodium subcarneum*, *Erysimum merxmuelleri*, *Hieracium virescens*, *Hieracium vulgatum*, *Leucanthemum sylvaticum*, *Linaria triornithophora*, *Malva colmeiroi*, *Nepeta coerulea* subsp. *sanabrensis* *Omphalodes nitida*, *Picris hieracioides* subsp. *longifolia*, *Prunella grandiflora* subsp. *pyrenaica*, *Silene coutinhoi*.

38.1.1. *Carduo platypi-Festucetum durandii* Ladero, F. Navarro, C. Valle, J.L. Pérez, M.T. Santos, Ruiz, M.I. Fernández, A. Valdés & F.J. González 1985

38.1.2. *Hieracio laevigati-Linarietum triornithophorae* Ladero, F. Navarro, C. Valle, J.L. Pérez, M.T. Santos, Ruiz, M.I. Fernández, A. Valdés & F.J. González 1985

38.1.3. *Omphalodo nitidae-Linarietum triornithophorae* Rivas-Martínez in Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas 1984

38.2. Origanion virentis Rivas-Martínez & O. Bolòs in Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas 1984

Semi-shaded humicolous woodland fringe communities, thermo to supramediterranean, dry to humid, Mediterranean West Iberian, Azorean and Maghrebi.

Typus: *Clinopodio villosae-Origanetum virentis* Rivas-Martínez & O. Bolòs in Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas 1984(38.2.2.).

Characteristic species: *Clinopodium vulgare* subsp. *arundanum*, *Origanum virens* var. *macrostachyum*, *Origanum virens* var. *virens*, *Ranunculus ollissiponensis* subsp. *ollissiponensis*, *Silene mellifera* subsp. *mellifera*.

38.2a. Origanenion virentis Capelo 1996

Silicolous acidophilous to neutrophilous communities.

Typus: *Clinopodio villosae-Origanetum virentis* Rivas-Martínez & O. Bolòs in Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas 1984 (38.2.2.).

Characteristic species: *Arabis stenocarpa*, *Conopodium marianum*.

38.2.1. *Cardaminetum caldeirari* Lüpnitz 1976

38.2.2. *Clinopodio villosae-Origanetum virentis* Rivas-Martínez & O. Bolòs in Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas 1984

38.2.3. *Pimpinello villosae-Origanetum virentis* Ladero, F. Navarro, C. Valle, J.L. Pérez, M.T. Santos, Ruiz, M.I. Fernández, A. Valdés & F.J. González 1985

38.2.4. *Vincetoxico nigri-Origanetum virentis* Ladero, F. Navarro, C. Valle, J.L. Pérez, M.T. Santos, T. Ruiz, M. Fernández, A. Valdés & F.J. González 1985

38.2b. Stachyo lusitanicae-Cheirolophenion sempervirentis Capelo 1996

Calcolous (calco-dolomitic) and neutrophilous communities, Coastal Lusitanian-Andalusian.

Typus: *Leucanthemo sylvatici-Cheirolophetum sempervirentis* J.C. Costa, Ladero, T.E. Díaz, Lousã, Espírito Santo, Vasconcellos, Monteiro & Amor 1993 (38.2.6.).

Characteristic species: *Arabis lusitanica*, *Cheirolophenion sempervirens*, *Cynara algarbiensis*, *Picris algarbiensis*, *Picris spinifera*, *Prunella x intermedia*, *Stachys germanica* subsp. *lusitanica*, *Stachys officinalis* subsp. *algeriensis*.

38.2.5. *Bartsio asperae-Origanetum virentis* C. Lopes, Lousã & Ladero ass. nova hoc loco

38.2.6. *Leucanthemo sylvatici-Cheirolophetum sempervirentis* J.C. Costa, Ladero, T.E. Díaz, Lousã, Espírito Santo, Vasconcellos, Monteiro & Amor 1993

38.2.7. *Origanum virentis-Leucanthemetum sylvatici* M. Pereira in Guineana 15: 215, 2009

38.2.8. *Picrido algarbiensis-Cheirolophetum sempervirentis* Pinto-Gomes & P. Ferreira in Flora e Vegetação do Barrocal Algarvio. Tavira-Portimão: 212, 2005

38.2.9. *Senecio lopezii-Cheirolophetum sempervirentis* Capelo 1996

38.2.10. *Stachyo lusitanicae-Origanetum virentis* (Capelo 1996) Capelo & J.C. Costa in J.C. Costa, Capelo, Espírito Santo & Lousã in Silva Lusit. 10 (1): 125, 2002

[*Clinopodio villosae-Origanetum virentis* Rivas-Martínez & O. Bolòs in Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas 1984 *helleboretosum foetidi* Capelo 1996]

38.3. *Ranunculo cortusifolii-Geranion canariensis*
Rivas-Martínez, Wildpret, Del Arco, O. Rodríguez, Pérez de Paz, García Gallo, Acebes, T.E. Díaz & Fernández-González 1993

Canarian and Madeiran communities.

Typus: Ranunculo cortusifolii-Geranietum canariensis Rivas-Martínez, Wildpret, Del Arco, O. Rodríguez, Pérez de Paz, García Gallo, Acebes, T.E. Díaz & Fernández-González 1993.

Characteristic species: *Dactylorhiza foliosa*, *Geranium palmatum*, *Pericallis aurita*, *Ranunculus cortusifolius* subsp. *major*, *Rumex maderensis*, *Teucrium francoi*, *Viola paradoxa*.

38.3.1. *Pericallido auritae-Geranietum palmatae* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 (fig. 29, page 108)

38.3.2. *Teucro francoi-Origanetum virentis* J.C. Costa, Capelo, Jardim, Sequeira, Lousã & Rivas-Martínez ass. nova hoc loco
[*Teucro francoi-Origanetum virentis* J.C. Costa, Capelo, Jardim, Sequeira, Espírito Santo, Lousã, Fontinha, Aguiar & Rivas-Martínez in Quercetea 6: 121-122, 2004 nom. inval. (art. 21, 5)]

VI. SUPRATIMBERLINE CLIMACTIC ZONAL VEGETATION ON CRYOPHILOUS GELITURBATED SOILS

VIa. WEST MEDITERRANEAN OROPHILOUS SILICEOUS VEGETATION

39. *FESTUCETEA INDIGESTAE* Rivas Goday & Rivas-Martínez 1971

Silicicolous and geliturbate communities dominated by gramineous and dwarf-chamaephytes in the supra to cryomediterranean and submediterranean bioclimate that are zonal in supratimberline and secondary at lower altitudes. They colonize umbrisol or cambisols, without histic or gleyic proprieties, in the Mediterranean West Iberian Peninsula and the North African Rif mountains.

Typus: Festucetalia curvifoliae Rivas Goday & Rivas-Martínez ex Rivas-Martínez 1964 corr. Izco & Pulgar 2009 (39a.).

Characteristic species: *Jurinea humilis*, *Koeleria caudata* subsp. *crassipes*, *Plantago radicata* subsp. *radicata*.

39a. *FESTUCETALIA CURVIFOLIAE* Rivas Goday & Rivas-Martínez ex Rivas-Martínez 1964 corr. Izco & Pulgar 2009

[*Festucetalia indigestae* Rivas Goday & Rivas-Martínez in Rivas-Martínez 1964]

Iberian silicicolous communities oro-cryotemperate submediterranean and oro-cryomediterranean dominated by dwarf-chamaephytes that often cover completely the ground. They are subject to geliturbate and gelifluction phenomena.

Typus: Minuartio bigerrensis-Festucion curvifoliae Rivas-Martínez 1964 corr. Rivas-Martínez, Fernández-González & Loidi 1999.

Characteristic species: *Dianthus langeanus*, *Hieracium myriadenum*, *Hieracium vahlii*, *Jasione crispa* subsp. *centralis*, *Leucanthemopsis flaveola* subsp. *flaveola*, *Minuartia recurva* subsp. *juressi*, *Silene ciliata* subsp. *elegans*.

39.1. *Teesdaliopsio-Luzulion caespitosae* Rivas-Martínez 1987

Orocantabrian, Bercian-Sanabriensean and Estrelensean associations, orotemperate (submediterranean) hyperhumid.

Typus: Teesdaliopsio confertae-Festucetum eskiae F. Prieto 1983.

Characteristic species: *Armeria duriaei*, *Armeria sam-paioi*, *Leontodon pyrenaicus* subsp. *cantabricus*, *Leontodon pyrenaicus* subsp. *herminicus*, *Leucanthemopsis flaveola* subsp. *alpestre*, *Luzula caespitosa*, *Teesdaliopsis conferta*.

39.1.1. *Jasiono centralis-Minuartietum juressi* Rivas-Martínez 1981 corr. Rivas-Martínez, T.E. Díaz, Fernández-González, Izco, Loidi, Lousã & Penas 2002

[*Jasiono centralis-Minuartietum bigerrensis* Rivas-Martínez 1981]

39b. *JASIONO SESSILIFLORAE-KOELERIETALIA CRASSIPEDIS*
Rivas-Martínez & Cantó 1987

Perennials secondary communities, dwarf-chamaephyte grassland-like on siliceous and geliturbate shallow soils, supra to lower oromediterranean dry to subhumid, in west central and south Iberian Peninsula.

Typus: Hieracio castellani-Plantaginion radicatae Rivas-Martínez & Cantó 1987 (39.3.).

Characteristic species: *Festuca summilunitana* subsp. *summilunitana*, *Helianthemum apenninum* subsp. *rothmaleri*, *Herniaria scabrida* var. *scabrida*, *Hieracium castellanum*, *Jasione sessiliflora* subsp. *sessiliflora*, *Ornithogalum concinnum*, *Petrorhagia saxifraga*, *Sesamoides purpurascens*.

39.2. *Armerion eriophyllae* P. Silva 1965

Meso-supramediterranean silicon-basophilic communities growing in rich metals and serpentinites habitats. Bercian-Sanabriensean and Lusitanian Durien-sean distribution.

Typus: Armerietum eriophyllae P. Silva 1965 (39.2.2.).

Characteristic species: *Arenaria querioides* subsp. *fontiqueri*, *Armeria eriophylla*, *Armeria langei* subsp. *daveaui*, *Armeria langei* subsp. *marizii*, *Astragalus incanus* subsp. *nummularioides*, *Dianthus laricifolius* subsp. *marizii*, *Festuca brigantina*, *Jasione sessiliflora* subsp. *serpenticola*, *Seseli peixoteanum*.

39.2.1. *Arenario fontiqueri-Armerietum marizii* Aguiar, Penas & Lousã 1998 corr. Aguiar, Monteiro-Henriques & Sánchez-Mata hoc loco

[*Arenario fontiqueri-Armerietum langei* Aguiar, Penas & Lousã 1998]

39.2.2. *Armerietum eriophyllae* P. Silva 1965

39.3. *Hieracio castellani-Plantaginion radicatae* Rivas-Martínez & Cantó 1987

Dwarf-chamaephyte grassland-like communities on siliceous undeveloped soils (leptosols), meso to oromediterranean. Mediterranean West Iberian and Orocantabrian distribution.

Typus: Thymo zygidis-Plantaginetum radicatae Rivas-Martínez & Cantó 1987 corr. Rivas-Martínez, Fernández-González, Sánchez-Mata & Pizarro 1990.

Characteristic species: *Agrostis truncatula* subsp. *truncatula*, *Anthemis alpestris*, *Arenaria queroioides* subsp. *queroioides*, *Armeria humilis* subsp. *humilis*, *Armeria transmontana*, *Bufonia macropetala*, *Centaurea herminii* subsp. *herminii*, *Corynephorus canescens* var. *canescens* (terr.), *Dianthus laricifolius* subsp. *laricifolius*, *Leucanthemopsis pulverulenta*, *Ortegia hispanica*, *Plantago radicata* subsp. *acanthophylla*, *Plantago radicata* subsp. *monticola*, *Reseda virgata*, *Scrophularia schousboei* subsp. *montana*, *Silene legionensis*.

- 39.3.1. *Arenario queroioidis-Sedetum brevifolii* Honrado, P. Alves, Hespanhol, Vieira & B. Caldas ass. nova hoc loco
- 39.3.2. *Armerio transmontanae-Plantaginetum radicatae* Aguiar 2002
- 39.3.3. *Diantho langeani-Festucetum summilusitanae* Monteiro-Henriques, J.C. Costa, Aguiar, Honrado & A. Bellu ass. nova hoc loco
- 39.3.4. *Minuartio juressi-Festucetum summilusitanae* C. Meireles, Pinto-Gomes & J.C. Costa ass. nova hoc loco
[*Arenario queroioidis-Festucetum summilusitanae* sensu auct. lus. non Rivas-Martínez, Sánchez-Mata & V. Fuente in Rivas-Martínez, Fernández-González & Sánchez-Mata 1986]
- 39.3.5. *Minuartio recurvae-Silenetum acutifoliae* Pulgar, Ortiz & Oubiña 1996
- 39.3.6. *Ortegio hispanicae-Agrostietum truncatulae* C. Antunes, Aguiar & J.C. Costa ined. [in Quercetea 11]
- 39.3.76. *Plantagini radicatae-Armerietum odoratae* Pulgar, Ortiz & J. Rodríguez Lazaroa 24: 26, 2003
- 39.3.8. *Polytricho-Agrostietum truncatulae* Br.-Bl., P. Silva & Rozeira in *Agronomia Lusit.* 18 (3): 196, 1955 (fig. 30, page 108)

39.4. *Festucion duriotaganae* Capelo, Aguiar, Penas, J.C. Costa & Lousã in *Silva Lusit.* 6(1): 117, 1998

Silicicolous thermomediterranean communities, growing on wide crevices and outcrops of torrential rivers with incipient soils in Western Iberian Peninsula.

Typus: Centaureo ornatae-Festucetum duriotaganae Capelo, Aguiar, Penas, J.C. Costa & Lousã 1998 (39.4.3.).

Characteristic species: *Centaurea ornata* subsp. *interrupta*, *Centaurea ornata* subsp. *ornata*, *Daucus setifolius*, *Dianthus laricifolius* subsp. *caespitosifolius*, *Dianthus laricifolius* subsp. *laricifolius*, *Festuca duriotagana*, *Narcissus jonquilla* var. *henriquesii*.

- 39.4.1. *Centaureo ornatae-Festucetum duriotaganae* Capelo, Aguiar, Penas, J.C. Costa & Lousã 1998 (fig. 31, page 108)
- 39.4.2. *Diantho caespitosifolii-Festucetum duriotaganae* Honrado, P. Alves, H. Nepomuceno & B. Caldas in *Silva Lusit.* 10(2): 254, 2002
- 39.4.3. *Diantho laricifolii-Petrorragietum saxifragae* Capelo, Aguiar, Penas, J.C. Costa & Lousã 1998

VII. GRASSLAND AND MEADOW VEGETATION

VIIa. THEROPHYTIC GRASSLANDS

40. TUBERARIETEA GUTTATAE (Br.-Bl. in Br.-Bl., Roussine & Nègre 1952) Rivas Goday & Rivas-Martínez 1963 em. Rivas-Martínez 1978 nom. mut.
[*Helianthemetea guttati* (Br.-Bl. in Br.-Bl., Roussine & Nègre 1952) Rivas Goday & Rivas-Martínez 1963 em. Rivas-Martínez 1978]

Therophytic vegetation growing on spring and early summer formed by ephemeral xerophilic pioneer plants with a small size, indifferent to the chemical composition of the substrate. They occupy no nitrophilous biotopes without hydromorphy and colonizing soils in an early development stage. Usually, these communities, occupies biotopes poor in no humified organic matter. They are distributed through Mediterranean Region in the thermo to lower oromediterranean xeric and pluviseasonal bioclimate and in the Eurosiberian Region, submediterranean or steppic territories.

Typus: Tuberarietalia guttati Br.-Bl. in Br.-Bl., Molinier & Wagner 1940 em. Rivas-Martínez 1978 num. mut. (40a.).

Characteristic species: *Alyssum minutum*, *Alyssum simplex*, *Anthyllis vulneraria* subsp. *lusitanica*, *Arenaria conimbricensis*, *Arenaria leptoclados*, *Arenaria serpyllifolia*, *Asterolinon linum-stellatum*, *Brachypodium distachyon*, *Briza maxima*, *Cerastium brachypetalum* subsp. *brachypetalum*, *Cerastium pumilum*, *Cerastium semidecandrum*, *Crucianella angustifolia*, *Crupina vulgaris*, *Erophila verna*, *Evax pygmaea*, *Galium parisiense*, *Helianthemum ledifolium*, *Helianthemum salicifolium*, *Herniaria cinerea*, *Hippocrepis ciliata*, *Hippocrepis multisiliquosa*, *Jonopsidium acaule*, *Lathyrus setifolius*, *Leontodon taraxacoides* subsp. *longirostris*, *Medicago littoralis*, *Medicago minima*, *Minuartia hybrida* subsp. *hybrida*, *Mibora minima*, *Petrorragia nanteuillii*, *Scleranthus polycarpus*, *Scleranthus verticillatus*, *Scorpiurus muricatus*, *Sedum rubens*, *Silene colorata*, *Silene conica*, *Trifolium campestre*, *Trifolium stellatum*, *Valerianella dentata*, *Vicia disperma*, *Vicia lathyroides*.

40a. TUBERARIETALIA GUTTATI Br.-Bl. in Br.-Bl., Molinier & Wagner 1940 em. Rivas-Martínez 1978 num. mut.
[*Helianthemetalia guttati* Br.-Bl. in Br.-Bl., Molinier & Wagner 1940 em. Rivas-Martínez 1978]

Plant communities dominated by siliceous and pioneer therophytes, that develop on oligotrophic soils often shallow and sometimes weakly acidic with a gravel surface, sandy or loamy texture gravel, and some consolidation.

Typus: Tuberarion guttatae Br.-Bl. in Br.-Bl., Molinier & Wagner 1940 nom. mut. (40.1.)

Characteristic species: *Aira caryophyllea* subsp. *caryophyllea*, *Aira cupaniana*, *Andryala integrifolia* var. *corymbosa*, *Anthoxanthum aristatum*, *Aphanes cornucopioides*, *Aphanes australis*, *Briza minor*, *Campanula lusitanica* subsp. *lusitanica*, *Eryngium tenue*, *Filago lutescens*, *Helianthemum aegyptiacum*, *Hymenocarpus lotoides*, *Jasione montana* subsp. *gracili-*

lis, *Lathyrus sphaericus*, *Linaria saxatilis* subsp. *saxatilis*, *Linaria sparteae*, *Logfia gallica*, *Logfia minima*, *Lotus conimbricensis*, *Micropyrum tenellum*, *Moenchia erecta*, *Molineriella laevis*, *Ornithopus compressus*, *Ornithopus perpusillus*, *Psilurus incurvus*, *Rumex bucephalophorus* subsp. *bucephalophorus*, *Rumex bucephalophorus* subsp. *gallicus*, *Silene portensis*, *Silene psammitis* subsp. *psammitis*, *Silene scabriflora* subsp. *scabriflora*, *Teesdalia nudicaulis*, *Tolpis barbata*, *Trifolium arvense*, *Trifolium strictum*, *Trifolium strictum*, *Trifolium sylvaticum*, *Tuberaria guttata*, *Vulpia bromoides*, *Vulpia myuros*.

40.1. *Tuberarion guttatae* Br.-Bl. in Br.-Bl., Molinier & Wagner 1940 nom. mut.

[*Helianthemion guttati* Br.-Bl. in Br.-Bl., Molinier & Wagner 1940]

Spring communities on siliceous sandy-loamy soil, thermo to lower supramediterranean and Mediterranean distribution.

Typus: *Tuberarietum guttatae* Br.-Bl. in Br.-Bl., Molinier & Wagner 1940 nom. mut.

Characteristic species: *Cleome violacea*, *Coronilla dura*, *Galium divaricatum*, *Helianthemum sanguineum*, *Hymenocarpus cornicina*, *Hypochaeris glabra*, *Jasione montana* subsp. *montana*, *Lathyrus angulatus*, *Linum trigynum*, *Molineriella minuta* subsp. *australis*, *Molineriella minuta* subsp. *minuta*, *Ononis cintrana*, *Ornithopus pinnatus*, *Paronychia cymosa*, *Paronychia echinulata*, *Plantago bellardii*, *Pterocephalus diandrus*, *Rumex bucephalophorus* subsp. *canariensis*, *Scleranthus delortii*, *Senecio minutus*, *Teesdalia coronopifolia*, *Tolpis umbellata*, *Vulpia muralis*, *Wahlenbergia lobelioides* subsp. *lobelioides*.

40.1a. *Tuberarion guttatae* num. mut.

[*Helianthemion guttati*]

Thermomediterranean and lower mesomediterranean communities in sandy-loamy soils.

Typus: *Tuberarietum guttatae* Br.-Bl. in Br.-Bl., Molinier & Wagner 1940 nom. mut.

- 40.1.1. *Anthyllido lusitanicae-Tuberarietum guttatae* Aguiar & Penas 2002
- 40.1.2. *Anthoxantho aristati-Holcetum setiglumis* Rivas Goday 1958 nom. inv.
[*Holco setiglumis-Anthoxantheum aristati* Rivas Goday 1958]
- 40.1.3. *Campanulo erini-Wahlenbergietum lobelioidis* Capelo, J.C. Costa, Jardim, Sequeira & Rivas-Martínez in Silva Lusit. 11(2): 259, 2003
- 40.1.4. *Holco annui-Brachypodietum distachyi* S. Ribeiro, Ladero & Espírito Santo in Plant Biosyst. 146(3): 538, 2012
- 40.1.5. *Leontodonto longirostris-Vulpietum bromoidis* S. Ribeiro, Ladero & Espírito Santo in Plant Biosyst. 146(3): 538, 2012
- 40.1.6. *Lupino rothmaleri-Ornithopetum isthmocarpae* Rivas Goday 1958
- 40.1.7. *Trifolio cherleri-Plantaginetum bellardii* Rivas Goday 1958

40.1b. *Evacenion carpetanae* Pérez Prieto & X. Font in Acta Bot. Malacitana 30: 149, 2005

Mesomediterranean Lusitanian-Extremadurean and Carpetan-Leonese communities.

Typus: *Periballio minutae-Airopsietum tenellae* Rivas Goday 1958 (40.1.13.).

Characteristic species: *Airopsis tenella*, *Evax carpetana*.

- 40.1.8. *Airo praecocis-Radioletum linoidis* Rivas Goday 1958
- 40.1.9. *Anthoxantho aristati-Micropyretum patentis* Belmonte & Sánchez-Mata in Sánchez-Mata 1989
- 40.1.10. *Holco annui-Micropyretum tenellae* S. Ribeiro, Ladero & Espírito Santo in Plant Biosyst. 146(3): 538, 2012
- 40.1.11. *Micropyro tenelli-Anthoxantheum aristati* S. Ribeiro, Ladero & Espírito Santo in Plant Biosyst. 146(3): 538, 2012
- 40.1.12. *Paronychio cymosae-Pterocephalium diantri* Rivas Goday 1958 corr. Rivas-Martínez 1978
- 40.1.13. *Periballio minutae-Airopsietum tenellae* Rivas Goday 1958

40.2. *Thero-Airion* Tüxen ex Oberdorfer 1957

Supramediterranean and meso-supratemperate, Euro-siberian, Catalan-Valencian and Madeiran communities.

Typus: *Filagini-Vulpietum myuri* Oberdorfer 1938.

Characteristic species: *Aira caryophyllea* subsp. *multiculmis*, *Aira praecox*, *Cerastium diffusum*, *Spergula morisonii*.

- 40.2.1. *Galio-Logfietum minimae* Izco & Ortiz 1985
- 40.2.2. *Leontodonto longirostris-Ornithopodetum perpusilli* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000

40.3. *Molineriellion laevis* Br.-Bl., P. Silva, Rozeira & Fontes 1952 nom. mut.

[*Molinerion laevis* Br.-Bl., P. Silva, Rozeira & Fontes 1952]

Oromediterranean Mediterranean West Iberian communities, that can occasionally occur on poor soils in Mediterranean Central Iberian.

Typus: *Arenario-Cerastietum ramosissimi* Br.-Bl., P. Silva, Rozeira & Fontes 1952 (40.3.1.).

Characteristic species: *Cerastium ramosissimum*, *Ctenopsis delicatula*, *Hispidella hispanica*, *Holcus annuus* subsp. *duriensis*, *Holcus gayanus*, *Linaria elegans*, *Micropyrum patens*, *Periballia involucrata*, *Trifolium phleoides* subsp. *willkommii*, *Trisetum ovatum*.

- 40.3.1. *Arenario-Cerastietum ramosissimi* Br.-Bl., P. Silva, Rozeira & Fontes 1952
- 40.3.2. *Ctenopsietum delicatulae* Sardinero, Fernández-González & Sánchez-Mata 2002
- 40.3.3. *Hispidello hispanicae-Tuberarietum guttatae* Rivas-Martínez & Fernández-González, Sánchez-Mata & J. M. Pizarro 1990

40.4. *Sedion caespitosi* (Rivas-Martínez 1978) Pérez Prieto & X. Font in Acta Bot. Malacitana 30: 148-149, 2005
[*Sedion caespitosi* Rivas-Martínez 1978]

Thermo-mesomediterranean communities dominated by small size succulent therophytes, colonizing very slender soils.

Typus: *Sedo caespitosi-Tillaeetum muscosae* Rivas Goday 1957 (40.4.1.).

Characteristic species: *Sedum caespitosum*.

40.4.1. *Sedo caespitosi-Tillaeetum muscosae* Rivas Goday 1957

40.5. *Sedion pedicellato-andegavensis* (Rivas-Martínez 1978) Rivas-Martínez, Fernández-González & Sánchez-Mata 1986

Communities constituted by ephemeral succulent therophytes, on incipient soils derived from siliceous rocks, meso to lower oromediterranean, with Mediterranean distribution.

Typus: *Polytricho piliferi-Sedetum pedicellati* Rivas-Martínez in Rivas-Martínez, Fernández-González & Sánchez-Mata 1986.

Characteristic species: *Sedum andegavense*, *Sedum arenarium*, *Sedum pedicellatum*, *Sedum willkommianum*.

40.5.1. *Agrostio truncatulae-Sedetum lusitanici* Rivas-Martínez, Fernández-González & Sánchez-Mata 1986

40.5.2. *Airo praecocis-Sedetum arenarii* Izco, Gutiérrez & Amigo 1986

40.5.3. *Chamaemelo fuscati-Sedetum andegavensis* Rivas Goday ex Rivas-Martínez, Fernández-González & Sánchez-Mata 1986

40.5.4. *Polycarpo diphylly-Evacietum ramosissimae* Ortiz, Pulgar & Rodríguez-Oubiña 2001

40.5.5. *Sedetum caespitoso-arenarii* Rivas-Martínez ex Fuente 1986

40.6. *Ornithopo pinnatae-Gaudinion coarctatae* F. Prieto & Aguiar in F. Prieto, Aguiar & Dias in Int. J. Geobot. Res. 2: 112. 2012

Pioneer, oligotrophic, spring and early summer ephemeral plant communities from the thermomediterranean and thermotemperate vegetation belts of the Azorean Islands

Typus: *Ornithopo pinnatae-Gaudinietum crocatae* Fernández-Prieto, Aguiar & Dias 2012 (40.6.1.)

Characteristic species: *Aichryson villosum* (ter.), *Gaudinia coarctata*, *Lolium aristatum*, *Rostraria azorica*.

40.6.1. *Ornithopo pinnatae-Gaudinietum coarctatae* F. Prieto & Aguiar in F. Prieto, Aguiar & Dias in Int. J. Geobot. Res. 2: 112. 2012

40b. MALCOLMIETALIA Rivas Goday 1958

Pioneer therophytic communities, with spring flowering, on deep unconsolidated sandy soils and paleodunes.

Typus: *Corynephoru articulatae-Malcolmion patulae* Rivas Goday 1958 (40.6.).

Characteristic species: *Agrostis tenerrima*, *Anthoxanthum ovatum*, *Avellinia michelii*, *Coronilla repanda*, *Erodium bipinnatum*, *Evax lusitanica*, *Hymenocarpos hamosus*, *Leucojum trichophyllum*, *Lotus castellanus*, *Lotus hispidus*, *Ononis diffusa*, *Ornithopus isthmocarpus*, *Ornithopus sativus*, *Pimpinella villosa*, *Romulea ramiflora* subsp. *gaditana*, *Rumex bucephalophorus* subsp. *hispanicus*, *Rumex roseus*, *Silene micropetala*, *Silene sclerocarpa*, *Vulpia membranacea*.

40.6. *Corynephoru articulatae-Malcolmion patulae* Rivas Goday 1958

Semicontinental mesomediterranean lower supramediterranean communities in sandy soils with Mediterranean West Iberian distribution.

Typus: *Loeflingio hispanicae-Malcolmietum patulae* Rivas Goday 1958 (40.6.2.).

Characteristic species: *Loeflingia hispanica*, *Malcolmia triloba* subsp. *patula*.

40.6.1. *Anthyllido hamosae-Malcolmietum patulae* Rivas Goday 1958

40.6.2. *Loeflingio hispanicae-Malcolmietum patulae* Rivas Goday 1958

40.6.3. *Loeflingio micranthae-Erodietum aethiopicum* Rivas Goday 1958

40.7. *Hymenocarpo hamosi-Malcolmion trilobae* Rivas Goday 1958 em. Rivas-Martínez 1978 nom. mut. (fig. 32, page 109)

[*Anthyllido hamosae-Malcolmion lacerae* Rivas Goday 1958 em. Rivas-Martínez 1978]

Sandy coastal communities, not subjected the influence of salt spray, thermomediterranean to lower mesomediterranean euoceanic and Coastal Lusitanian-Andalusian distribution.

Typus: *Hymenocarpo hamosi-Malcolmietum trilobae* Rivas Goday 1958 num. mut. & nom. inv.

Characteristic species: *Arenaria algarbiensis*, *Arenaria emarginata*, *Corynephorus fasciculatus*, *Corynephorus macrantherus*, *Linaria algarviana*, *Loeflingia baetica* var. *baetica*, *Loeflingia baetica* var. *micrantha*, *Loeflingia baetica* var. *tavaresiana*, *Lotus arenarius*, *Malcolmia triloba* subsp. *gracilima*, *Malcolmia triloba* subsp. *triloba*, *Ononis baetica*, *Ononis broteroana*, *Ononis dentata*, *Ononis hackelii*, *Scilla odorata*, *Silene gracilis*, *Tuberaria bupleurifolia*, *Trisetum dufourei*, *Vulpia fontquerana*.

40.7.1. *Cerastio diffusi-Vulpietum fontqueranae* J.C. Costa, Neto, Capelo & Lousã in Plant Biosyst. 145 Supplement: 102, 2011

40.7.2. *Corynephoru macrantheri-Arenarietum algarbiensis* P. Silva & Teles ex Rivas-Martínez & Izco 2002

[*Anachorto-Arenarietum algarbiensis* P. Silva in P. Silva & Teles 1972 nom. inval. (art.1)]

40.7.3. *Omphalodo kuzinskyanae-Evacietum ramosissimae* Neto, Monjardino, E. Pereira, Lousã & J.C. Costa in J.C. Costa, Neto, Capelo & Lousã in Plant Biosyst. 145 Supplement: 102-103, 2011

40.7.4. *Tolpido barbatae-Tuberarietum bupleurifoliae* J.C. Costa in J.C. Costa, Lousã & Espírito Santo 1997

40c. BRACHYPODIETALIA DISTACHYI Rivas-Martínez 1978
[*Trachynietalia distachyae* Rivas-Martínez 1978]

Alkaline therophytic communities, with spring phenology, that develop on rich soils (limestone, clay, gypsum, dolomite, serpentinites, mafic), slightly eutrophic and becoming dry during the summer. Mediterranean and southern Eurosiberian distribution.

Typus: Brachypodium distachyi Rivas-Martínez 1978 nom. mut. (40.8.).

Characteristic species: *Ajuga iva*, *Alyssum alyssoides*, *Ammoides pusilla*, *Atractylis cancellata*, *Brachypodium distachyon*, *Bupleurum gerardi*, *Bupleurum semicompositum*, *Echinaria capitata*, *Euphorbia exigua*, *Euphorbia falcata*, *Hippocrepis biflora*, *Limonium echinoides*, *Linum strictum* var. *strictum*, *Linum strictum* var. *spicatum*, *Micropus supinus*, *Neotostema apulum*, *Ononis pubescens*, *Ononis reclinata*, *Ononis viscosa* subsp. *breviflora*, *Polygala monspeliaca*, *Saxifraga tridactylites*, *Scabiosa stellata* subsp. *stellata*, *Scandix australis*, *Sideritis romana*, *Valantia hispida*, *Valerianella discoidea*, *Valerianella eriocarpa*, *Valerianella microcarpa*, *Xeranthemum cylindraceum*.

40.8. Brachypodium distachyi Rivas-Martínez 1978
nom. mut.

[*Trachynion distachyae* Rivas-Martínez 1978]

Basophilic therophytic communities, thermo to supramediterranean pluviseasonal or thermo-mesotemperate submediterranean, on calcareous and loamy substratum.

Typus: Saxifraga tridactylitae-Hornungietum petraeae Izco 1974 (40.8.5.).

Characteristic species: *Blackstonia acuminata* subsp. *aestiva*, *Campanula erinus*, *Chaenorhinum minus*, *Cleonia lusitanica*, *Crupina vulgaris*, *Daucus durieua*, *Euphorbia sulcata*, *Hornungia petraea*, *Jasione blepharodon*, *Linaria haenseleri*, *Linaria micrantha*, *Linaria simplex*, *Omphalodes linifolia*, *Scabiosa stellata* subsp. *simplex*, *Thymelaea passerina*, *Trisetum scabriusculum*, *Velezia rigida*.

40.8.1. *Anthyllido lusitanicae-Brachypodietum distachyi* Espírito Santo & Capelo in J.C. Costa, Capelo, Espírito Santo & Lousã 2002 corr. Espírito Santo, Capelo, J.C. Costa & Aguiar in Aguiar, J.C. Costa, Capelo, Amado, Honrado, Espírito Santo & Lousã in Silva Lusit. 11 (1): 109, 2003

[*Anthyllido gandogeri-Brachypodietum distachyi* Espírito Santo & Capelo in J.C. Costa, Capelo, Espírito Santo & Lousã in Silva Lusit. 10 (1): 125-126, 2002]

40.8.2. *Euphorbietum acuminato-merinoi* Aguiar & Penas 2002

40.8.3. *Hornungio petraeae-Linarietum haenseleri* Pinto-Gomes & P. Ferreira in Flora e Vegetação do Barrocal Algarvio. Tavira-Portimão: 213-214, 2005

40.8.4. *Minuartio hybridae-Saxifragetum tridactylitae* T.E. Díaz & Penas 1984

40.8.5. *Saxifrago tridactylitae-Hornungietum petraeae* Izco 1974

40.8.6. *Velezio rigidae-Asteriscetum aquaticae* Rivas Goday 1964

40d. CUTANDIETALIA MARITIMAE Rivas-Martínez, Díez Garretas & Asensi 2002

Communities of coastal dunes, subject to salt spray. Mediterranean and Galician-Portuguese distribution.

Typus: Linarion pedunculatae Díez Garretas, Asensi & Esteve in Díez Garretas 1984 (40.9).

Characteristic species: *Cutandia maritima*, *Erodium laciniatum*, *Malcolmia ramosissima*, *Ononis variegata*, *Phleum arenarium*, *Polycarpon alsinifolium*, *Polycarpon diphyllum*, *Pseudorlaya pumila*, *Silene nicaeensis*, *Silene ramosissima*, *Triplachne nitens*, *Vulpia fasciculata*.

40.9. Linarion pedunculatae Díez Garretas, Asensi & Esteve in Díez Garretas 1984 (fig. 32, page 109)

Coastal dunes communities. Coastal Lusitanian-Andalusian, Galician-Portuguese, Murcian-Almerian and Tingitanan distribution.

Typus: Ononido variegatae-Linarietum pedunculatae Díez Garretas, Asensi & Esteve ex Izco, P. & J. Guitián 1988 (40.9.2.).

Characteristic species: *Chaenorhinum serpyllifolium* subsp. *lusitanicum*, *Hedypnois arenaria*, *Herniaria algarvica*, *Hypocoum littorale*, *Linaria ficalhoana*, *Linaria munbyana* subsp. *pygmaea*, *Linaria pedunculata*, *Ononis cossoniana*, *Pseudorlaya minuscula*, *Silene littorea* subsp. *littorea*.

40.9.1. *Herniario algarvicae-Linarietum ficalhoanae* Díez Garretas 1984 (fig. 33, page 109)

40.9.2. *Ononido variegatae-Linarietum pedunculatae* Díez Garretas, Asensi & Esteve ex Izco, P. & J. Guitián 1988

40.9.3. *Pseudorlaya minusculae-Polycarpetum alsinifolii* J.C. Costa, Neto, Capelo & Lousã in Plant Biosyst. 145 Supplement: 92, 2011

40.9.4. *Violo henriquesii-Silenetum littoreae* Izco & Guitián 1988

40. 10. Corynephorion maritimi J.C. Costa, Pinto-Gomes, Neto & Rivas-Martínez all. nova hoc loco

Inland dunes and paleodunes associations, characterized by *Corynephorus canescens* subsp. *maritimus*, in Mediterranean pluviseasonal-oceanic thermomediterranean to lower mesomediterranean dry to subhumid, euhyperoceanic to barely hyperoceanic bioclimate, Coastal Lusitanian-Andalusian and Galician-Portuguese distribution.

Typus: Herniario maritimae-Corynephorietum maritimi Pinto-Gomes, P. Ferreira, Cano & S. Mendes in Acta Bot. Gallica 153(3): 344, 2006 (40.10.2.).

Characteristic species: *Anagallis monelli* var. *linifolia*, *Anagallis monelli* var. *microphylla*, *Corynephorus canescens* var. *maritimus*, *Carex arenaria* (dif.), *Echium gaditanum*, *Herniaria ciliolata* subsp. *robusta*, *Herniaria maritima*, *Herniaria scabrida* var. *unamunoana*, *Sesamoides spathulifolia*.

40.10.1. *Echio gaditanae-Corynephorietum maritimi* J.C. Costa, Neto, Pinto-Gomes & Lousã ass. nova hoc loco

40.10.2. *Herniario maritimae-Corynephorietum maritimi* Pinto-Gomes, P. Ferreira, Cano & S. Mendes in Acta Bot. Gallica 153(3): 344, 2006

40.10.3. *Herniario robustae-Corynephorum maritimi* Pinto-Gomes, P. Ferreira, Cano & S. Mendes in Acta Bot. Gallica 153(3): 345, 2006

[sin. *Sedo sediformis-Corynephorum maritimi* Honrado, P. Alves, Lomba, J. Vicente, G. Silva & Nepomuceno in Silva Lusit. 14 (2): 270, 2007 (syntax. syn.)]

40.10.4. *Herniario unamunoanae-Corynephorum maritimi* Pinto-Gomes, P. Ferreira, Cano & S. Mendes in Acta Bot. Gallica 153(3): 348, 2006

40.10.5. *Linario polygaliphyllae-Corynephorum maritimi* J. Rodriguez, Ortiz & Pulgar 1988 corr. J.C. Costa, Neto, Pinto-Gomes & Louçã corr. hoc loco.

[*Linario polygaliphyllae-Corynephorum canescens* J. Rodriguez, Ortiz & Pulgar 1988]

VIIb. PERENNIAL XEROPHYTIC AND MESOPHYTIC GRASSLANDS

41. *FESTUCO-BROMETEA* Br.-Bl. & Tüxen ex Klika & Hadáč 1944

Anthropic grazed perennial grasslands, mesophytic or xerophytic, on deep soils (basophil, neutral or slightly acid) rich in nutrients and without temporal hydromorphy, in thermo to supratermperate subhumid to hyperhumid oceanic and thermo to supratermperate dry to humid oceanic to subcontinental bioclimate. Eurosiberian and Western Mediterranean distribution.

Typus: Brometalia erecti Br.-Bl. 1936 (41a.).

Characteristic species: *Aceras anthropophorum*, *Anacamptis pyramidalis*, *Carex caryophyllea*, *Centaureum erythraea* subsp. *erythraea*, *Centaureum erythraea* subsp. *grandiflorum*, *Centaureum erythraea* subsp. *majus*, *Erigeron acer*, *Filipendula vulgaris*, *Gagea pratensis*, *Galium verum* var. *verum*, *Inula montana*, *Linum catharticum*, *Leontodon hispidus* subsp. *hispidus*, *Ophrys apifera*, *Orchis mascula* subsp. *mascula*, *Orobanche gracilis*, *Phleum phleoides*, *Prunella laciniata*, *Sanguisorba minor* subsp. *minor*, *Sanguisorba minor* subsp. *multiculmis*, *Scabiosa columbaria* subsp. *columbaria*, *Spiranthes spiralis*, *Teucrium chamaedrys* subsp. *chamaedrys*, *Thymus pulegioides*.

41a. *BROMETALIA ERECTI* Br.-Bl. 1936

Atlantic-Central European, Alpine-Pyrenean and Apennine-Balkan seral mesophytic and subxerophytic grasslands, on neutral base-rich deep soils without temporal hydromorphy, in thermo to supratermperate (sometimes submediterranean) subhumid to hyperhumid barely hyperoceanic to semicontinental bioclimate.

Typus: Bromion erecti Koch ex Br.-Bl. 1936

Characteristic species: *Luzula campestris* subsp. *campestris*, *Onobrychis viciifolia*, *Ononis spinosa* subsp. *spinosa*, *Orchis morio* subsp. *morio*, *Potentilla neumanniana*, *Prunella grandiflora*, *Ranunculus bulbosus* subsp. *bulbifer*.

41.1. *Potentillo montanae-Brachypodium rupestris* Br.-Bl. 1967 corr. Rivas-Martínez, T.E. Díaz, Fernández-González, Izco, Loidi, Louçã & Penas 2002

Mesophytic baso-neutrophilous calcicolous grasslands, in thermo to supratermperate subhumid to hyperhumid bioclimate, with southern Cantabrian-Atlantic, Orocantabrian, Pyrenean and Oroiberian distribution.

Typus: Seseli cantabrici-Brachypodium rupestris Br.-Bl. 1967

Characteristic species: *Anthyllis vulneraria* subsp. *sampaioana*, *Brachypodium rupestre*, *Potentilla montana*.

41.1.a. *Potentillo montanae-Brachypodium rupestris* J. Guitián, Izco & Amigo 1989

Mesophytic baso-neutrophilous calcicolous communities, with southern Cantabrian-Atlantic, Orocantabrian distribution.

Typus: Seseli cantabrici-Brachypodium rupestris Br.-Bl. 1967

Characteristic species: *Avenula lusitanica*.

41.1.1. *Seseli peixotoani-Avenuletum lusitanicae* Aguiar, Monteiro-Henriques & Sánchez-Mata in Lazaroa 33: 2012

41.1.2. Community of *Brachypodium rupestre*

41b. *BRACHYPODIETALIA PHOENICOIDIS* Br.-Bl. ex Molinier 1934

Perennial seral xerophytic prairies and grasslands, on deep soils rich in limestone bases with loam or clayey texture. Distribution southwestern Europe, in oceanic to subcontinental, meso-supratermperate and thermo to supratermperate dry to subhumid bioclimate.

Typus: Brachypodium phoenicoidis Br.-Bl. ex Molinier 1934 (41.2.).

Characteristic species: *Allium paniculatum*, *Allium roseum*, *Allium vineale*, *Althaea cannabina*, *Aster sedifolius*, *Brachypodium phoenicoides*, *Cachrys sicula*, *Ferula communis*, *Galium lucidum*, *Gladiolus illyricus*, *Hypericum perforatum*, *Hypericum perforatum*, *Mantisalca salmantica*, *Medicago* subsp. *sativa*, *Melica ciliata* subsp. *magnolii*, *Nepeta tuberosa* subsp. *tuberosa*, *Ophrys fusca*, *Ophrys scolopax*, *Ophrys speculum*, *Orchis conica*, *Orchis italica*, *Stipa bromoides*, *Scorzonera angustifolia*, *Tragopogon crocifolius*.

41.2. *Brachypodium phoenicoidis* Br.-Bl. ex Molinier 1934

Sub-xerophytic and calcicolous grasslands with medium size herbs, thermo to supratermperate dry to subhumid with West Mediterranean distribution.

Typus: Brachypodium phoenicoidis Br.-Bl. 1924.

Characteristic species: *Armeria linkiana*, *Asphodelus ramosus* var. *distalis*, *Centaurea bethurica*, *Galium concatenatum*, *Hieracium peleteranum*, *Narcissus bulbocodium* subsp. *obesus*, *Orchis coriophora* subsp. *fragrans*, *Salvia sclareoides*, *Tragopogon dubius*.

41.1.2. *Phlomido lychnitidis-Brachypodium phoenicoidis* Br.-Bl., P. Silva & Rozeira 1955

41.1.3. *Galio concatenati-Brachypodium phoenicoidis* Pinto-Gomes & P. Ferreira in Flora e Vegetação do Barrocal Algarvio. Tavira-Portimão: 218, 2005

42. POETEA BULBOSAE Rivas Goday & Rivas-Martínez in Rivas-Martínez 1978

Dwarf caespitose perennial pastures, with small prostrate chamaephytes and hemicryptophytes as *Poa bulbosa* and clovers, submitted and maintained by intensive sheep grazing on dry soils, rarely affected by hydromorphy. Their distribution has a very close link with the traditional grazing areas and livestock transhumance routes. Such anthropic meadows dry in early summer, but with the first autumn rains, sprout and grow rapidly, remaining green and fertile during the winter. In springtime the clearings in the manured green carpet constitute a favourable habitat to the development of therophytic plants. Western Mediterranean distribution, in oceanic thermo to supramediterranean upper semiarid to humid bioclimate.

Typus: Poetalia bulbosae Rivas Goday & Rivas-Martínez in Rivas Goday & Ladero 1970 (42a).

Characteristic species: *Bellis annua* subsp. *annua*, *Bellis sylvestris* var. *pappulosa*, *Bellis sylvestris* var. *sylvestris*, *Gynandris sisyrrinchium*, *Leontodon tuberosus*, *Leucojum autumnale*, *Ornithogalum orthophyllum* subsp. *baeticum*, *Romulea bulbocodium* subsp. *bulbocodium*, *Scilla autumnalis*.

42a. POETALIA BULBOSAE Rivas Goday & Rivas-Martínez in Rivas Goday & Ladero 1970

Single order.

Typus: Periballio-Trifolium subterranei Rivas Goday 1964 nom. inv. (42.1.)

Characteristic species: *Erodium botrys*, *Gagea lusitani-ca*, *Herniaria glabra*, *Narcissus serotinus*, *Parentucellia latifolia*, *Paronychia argentea*, *Poa bulbosa* var. *bulbosa*, *Poa bulbosa* var. *vivipara*, *Ranunculus bullatus*, *Ranunculus paludosus*, *Romulea ramiflora* subsp. *ramiflora*, *Scorpiurus vermiculatus*, *Taraxacum obovatum*, *Trifolium nigrescens*, *Trifolium subterraneum* subsp. *oxaloides*, *Trifolium suffocatum*, *Trifolium tomentosum*.

42.1. Periballio-Trifolium subterranei Rivas Goday 1964 nom. inv.

[*Trifolium subterranei-Periballion* Rivas Goday 1964]

Siliceous and slightly acidophilous pastures, thermo to oromediterranean dry to humid and supra-orotemperate sub-humid to humid of the Mediterranean West Iberian and with Oroiberian, Galician-Portuguese, Maghrebi and Sardinian disjunctions.

Typus: Trifolio subterranei-Poetum bulbosae Rivas Goday 1964 nom. inv. (42.1.4.)

Characteristic species: *Astragalus cymbaearpos*, *Biserrula pelecinus*, *Onobrychis humilis*, *Trifolium bocconeii*, *Trifolium gemellum*, *Trifolium glomeratum*, *Trifolium subterraneum* subsp. *subterraneum*.

42.1.1. Brizo minoris-Trifolietum subterranei Amor, Ladero & C.J. Valle 1993

42.1.2. Festuco amplae-Poetum bulbosae Rivas-Martínez & Fernández González in Rivas-Martínez, Fernández González & Sánchez Mata 1986

42.1.3. Poo bulbosae-Onobrychidetum humilis Rivas Goday, Ladero & C. Rivas in Rivas Goday & Ladero 1970 nom. mut.

[*Poo bulbosae-Onobrychidetum eriophorae* Rivas Goday, Ladero & C. Rivas in Rivas Goday & Ladero 1970]

42.1.4. Trifolio subterranei-Poetum bulbosae Rivas Goday 1964 nom. inv.

[*Poo bulbosae-Trifolietum subterranei* Rivas Goday 1964]

42.2. Plantaginion serrariae Galán, Morales & Vicente 2000

Communities developed on loamy or clayey soils slightly decarbonated, rich in *Plantago serraria*, *Trifolium subterraneum* and poor in *Poa bulbosa*, in thermo to mesomediterranean subhumid to humid bioclimate and Baetic, Coastal Lusitanian-Andalusian and Maghrebi distribution.

Typus: Trifolio subterranei-Plantaginetum serrariae Martín Osorio & Galán in Galán, Morales & Vicente 2000 (43.2.1.).

Characteristic species: *Erodium primulaceum*, *Meren-dera filifolia*, *Plantago serraria*.

43.2.1. Trifolio subterranei-Plantaginetum serrariae Martín Osorio & Galán in Galán, Morales & Vicente 2000

42.3. Astragalo sesamei-Poion bulbosae Rivas Goday & Ladero 1970 nom. invers.

[*Poo bulbosae-Astragalion sesamei* Rivas Goday & Ladero 1970]

Neutral and basophils pastures that develop on calcareous and marly substratum, in thermo to supramediterranean semiarid to subhumid bioclimate.

Typus: Astragalo sesamei-Poetum bulbosae Rivas Goday & Ladero 1970 nom. inv. (42.3.1.).

Characteristic species: *Astragalus echinatus*, *Astragalus epiglottis*, *Astragalus sesameus*, *Astragalus stella*, *Convolvulus lineatus*, *Lupinus micranthus*, *Medicago intertexta*, *Plantago albicans*, *Plantago loeflingii*, *Trifolium scabrum*.

42.3.1. Astragalo sesamei-Poetum bulbosae Rivas Goday & Ladero 1970 nom. inv.

[*Poo bulbosae-Astragaletum sesamei* Rivas Goday & Ladero 1970]

43. SEDO ALBI-SCLERANTHETEA BIENNIS Br.-Bl. 1955

Xerophytic saxicolous perennial vegetation formed by small succulent chamaephytes and geophytes accompanied by therophytes, on leptosols and rocky surfaces, with an Eurosiberian and Mediterranean distribution.

Typus: Sedo albi-Scleranthetalia biennis Br.-Bl. 1955 (43).

Characteristic species: *Potentilla rupestris*, *Rumex acetosella*, *Scleranthus perennis*, *Sedum acre*, *Sedum album*, *Sedum amplexicaule*, *Sedum brevifolium*, *Sedum tenuifolium*.

43a. SEDO ALBI-SCLERANTHETALIA BIENNIS Br.-Bl. 1955
Single order.

Typus: Sedo albi-Scleranthion biennis Br.-Bl. 1955.

43.1. Sedion anglici Br.-Bl. in Br.-Bl. & Tüxen 1952

Siliceous and acid communities that are primocolonizers of leptosols, in hyperoceanic euoceanic thermo to supratemperate humid to hyperhumid bioclimate and with a Cantabrian-Atlantic and Galician-Portuguese distribution.

Typus: Airo praecocis-Sedetum anglici Br.-Bl. in Tüxen 1952 (43.1.1.).

Characteristic species: *Armeria humilis* subsp. *odorata*, *Ornithogalum broteroi*, *Sedum anglicum* subsp. *anglicum*, *Sedum pruinaum*, *Thymus caespititius*.

43.1.1. *Airo praecocis-Sedetum anglici* Br.-Bl. in Tüxen 1952

43.1.2. *Leucojo autumnalis-Thymetum caespititii* Honrado, P. Alves & Nepomuceno in Honrado, P. Alves, Nepomuceno & B.Caldas in Silva Lusit. 10(2): 252, 2002

43.1.3. *Ornithogalo broteroi-Armerietum odoratae* Pulgar, Honrado, Ortiz & J. Rodriguez in Ortiz, Pulgar & J. Rodriguez in Lazaroa 17: 132, 2003

43.1.4. *Sedo anglici-Thymetum caespititii* Oubiña, Ortiz & Pulgar 1996

43.1.5. *Sedo pruinati-Thymetum caespititii* Ortiz, Pulgar & J. Rodriguez 1999

43.2. *Sedion pyrenaici* Tüxen ex Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas in T.E. Díaz & F. Prieto 1994

Pioneer communities of siliceous leptosols, sometimes rich in bases in the euoceanic and moderate continental supra-orotemperate, sub-humid to hyperhumid bioclimate and with a Pyrenean, Orocantabrian and Mediterranean West Iberian distribution.

Typus: Sileno rupestris-Sedetum pyrenaici Tüxen in Tüxen & Oberdorfer 1958.

Characteristic species: *Agrostis durieui*, *Agrostis truncatula* subsp. *commista*, *Sedum anglicum* subsp. *pyrenaicum*.

43.2.1. *Sedetum brevifolio-pyrenaici* Rivas-Martínez & Sánchez-Mata in Sánchez-Mata 1989

43.3. *Thymion micans* J.C. Costa, Capelo, Jardim, Sequeira & Rivas-Martínez in Silva Lusit. 13 (1): 132, 2005

Supratemperate submediterranean communities in Madeira Island.

Typus: Thymetum micans J.C. Costa, Capelo, Jardim, Sequeira, Espírito Santo, Lousã, Fontinha, Aguiar & Rivas-Martínez in Quercetea 6: 107-108, 2004 (43.3.1.).

Characteristic species: *Thymus micans*.

43.3.1. *Thymetum micans* J.C. Costa, Capelo, Jardim, Sequeira, Espírito Santo, Lousã, Fontinha, Aguiar & Rivas-Martínez in Quercetea 6: 107-108, 2004

43.4. *Sedion micrantho-sediformis* Rivas-Martínez, P. Sánchez & Alcaraz ex P. Sánchez & Alcaraz 1993

[*Sedion micranthi* (O. Bolòs 1981) de la Torre, Alcaraz & Vicedo 1996]

Succulent pioneer communities, dominated by *Sedum* species colonizing limestone earthy terraces and rocky crevices with gravel and coarse sand, Mediterranean, thermo to supramediterranean semi-arid to humid.

Typus: Sedetum micrantho-sediformis O. Bolòs & Masalles in O. Bolòs 1981 (43.4.1.).

Characteristic species: *Sedum sediforme*.

43.4.1. *Sedetum micrantho-sediformis* O. Bolòs & Masalles in O. Bolòs 1981

44. *LYGEO-STIPETEA* Rivas-Martínez 1978 nom. conserv. [Thero-Brachypodietea Br.-Bl. ex A. & O. Bolòs 1959]

Herbaceous dense Mediterranean vegetation, consisting of perennial large size grasses with stiff leaves, and deeply rooted, with xerophilic nature and colonizing soils rich in bases, without hydromorphy or salinity. Ecologically, these formations represent an early seral stage of the xeric forests and shrublands belonging to *Quercetea ilicis*.

Typus: Lygeo-Stipetalia Br.-Bl. & O. Bolòs 1958 nom. conserv. (44a).

Characteristic species: *Allium pallens*, *Allium sphaerocephalon*, *Arrhenatherum album* var. *album*, *Bituminaria bituminosa*, *Brachypodium retusum*, *Convolvulus althaeoides*, *Dactylis hispanica*, *Dipcadi serotinum*, *Gladiolus italicus*, *Lavandula multifida*, *Ophrys vernixia*, *Phagnalon saxatile* subsp. *saxatile*.

44a. *LYGEO-STIPETALIA* Br.-Bl. & O. Bolòs 1958 nom. conserv. [Thero-Brachypodietalia Br.-Bl. ex Bharucha 1933 nom. amb. propos.]

Perennial xerophytic grasslands, on deep calcareous soils, well structured, colonizing slightly altered biotopes, in the Mediterranean Region, in thermo to supramediterranean arid to sub-humid bioclimate.

Typus: Agropyro pectinati-Lygeion sparti Br.-Bl. & O. Bolòs 1958 corr. Rivas-Martínez, T.E. Díaz, Fernández González, Izco, Loidi, Lousã & Penas 2002.

Characteristic species: *Avenula bromoides* subsp. *bromoides*, *Linum narbonense*, *Ophrys drys*, *Ophrys lutea*, *Ornithogalum narbonense*, *Stipa offneri*, *Thapsia dissecta*, *Tulipa sylvestris* subsp. *australis*.

44.1. *Teucrio pseudochamaepityos-Brachypodium retusi* Br.-Bl. 1925 ex Rivas-Martínez in Itinera Geobot. 18(1): 286, 2011 [Thero-Brachypodium ramosi Br.-Bl. 1925]

Small sized perennial communities dominated by *Brachypodium retusum*, in which are abundant hemi-cryptophytes and geophytes. Occurring in calcareous marly biotopes, often with a stony surface layer caused by an interstitial erosion of the thin mineralized deposit, in thermo to supramediterranean, semi-arid sub-humid areas. They represent, in succession, one step more degraded than the meadows of tall grasses.

Typus: Irido chamaeirido-Brachypodietum retusi (Br.-Bl. in Br.-Bl., Roussine & Nègre 1952) Rivas-Martínez in Itinera Geobot. 18(1): 287, 2011.

Characteristic species: *Biarum dispar*, *Eryngium dilatatum*, *Iris subbiflora*, *Ophrys bombyliflora*, *Ophrys tenthredinifera*, *Phlomis lychnitis*, *Teucrium pseudochamaepityos*.

44.1.1. *Iberido microcarpae-Stipetum offneri* Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990

44.2. *Stipion tenacissimae* Rivas-Martínez 1978

Grassland dominated by the tall grass *Stipa tenacissima*, on calcareous clay soils, thermo to mesomediterranean semi-arid to dry.

Typus: Lapiedro martinezii-Stipetum tenacissimae Rivas-Martínez & Alcaraz in Alcaraz 1984.

Characteristic species: *Avenula gervaisii* subsp. *gervaisii*, *Bellevalia hackelii*, *Stipa tenacissima*.

- 44.2.1. *Bellevalia hackelii-Stipetum tenacissimae* Pinto-Gomes & P. Ferreira in Flora e Vegetação do Barrocal Algarvio. Tavira-Portimão: 225, 2005

44b. HYPARRHENIETALIA HIRTAE Rivas-Martínez 1978

Grassland rich in perennial and tall grasses, on deep soils of rocky or clayey cliffs, and abandoned crop fields with some nitrification, in infra to mesomediterranean semiarid to subhumid bioclimate and Mediterranean distribution.

Typus: *Hyparrhenion sinaicae* Br.-Bl., P. Silva & Rozeira 1955 corr. J.C. Costa, Capelo, Espírito Santo & Lousã 2001 (44.3.).

- 44.3. Hyparrhenion sinaicae** Br.-Bl., P. Silva & Rozeira 1955 corr. J.C. Costa, Capelo, Espírito Santo & Lousã 2001

[*Hyparrhenion hirtae* Br.-Bl., P. Silva & Rozeira 1955 (art.43)]

Single order in Portugal.

Typus: *Carici depressae-Hyparrhenietum sinaicae* Br.-Bl., P. Silva & Rozeira 1955 corr. J.C. Costa, Capelo, Espírito Santo & Lousã 2001 (44.3.2.).

Characteristic species: *Allium subvillosum*, *Andropogon distachyos*, *Andryala integrifolia* var. *integrifolia*, *Andryala laxiflora*, *Aristida adscensionis*, *Cenchrus ciliaris*, *Dactylis smithii* subsp. *hylodes*, *Daucus crinitus*, *Hyparrhenia hirta*, *Hyparrhenia sinaica*, *Lathyrus clymenum*, *Pennisetum setaceum*, *Pseudarrhenatherum pallens*.

- 44.3.1. *Andryala laxiflorae-Hyparrhenietum hirtae* Peinado, Martínez-Parras & Alcaraz ex Díez Garretas & Asensi 2002
- 44.3.2. *Carici depressae-Hyparrhenietum sinaicae* Br.-Bl., P. Silva & Rozeira 1955 corr. J.C. Costa, Capelo, Espírito Santo & Lousã 2001 [*Carici depressae-Hyparrhenietum hirtae* Br.-Bl., P. Silva & Rozeira 1955]
- 44.3.3. *Cenchrus ciliaris-Hyparrhenietum sinaicae* Wildpret & O. Rodríguez in Rivas-Martínez, Wildpret, Del Arco, O. Rodríguez, Pérez de Paz, García Gallo, Acebes, T.E. Díaz & Fernández-González 1993 corr. Díez-Garretas & Asensi 1999
- 44.3.4. *Dactylido hylodis-Hyparrhenietum sinaicae* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000
- 44.3.5. *Daucus criniti-Hyparrhenietum sinaicae* Rivas-Martínez in Rivas-Martínez, Fernández-González & Sánchez-Mata 1986 corr. Díez Garretas & Asensi 1999

45. STIPO GIGANTEAE-AGROSTIETEA CASTELLANAE Rivas-Martínez, Fernández-González & Loidi 1999

Siliceous acidophilic perennial vegetation of grasses and other perennial herbs accompanied by some annual plants, rich in endemic species, on cambisols, planosols, luvisols and arenosols, dystic or umbric attributes. Represent seral stages of *Quercion broteroi* and *Quercion*

pyrenaicae. Western Mediterranean distribution with Cantabrian-Atlantic and Madeiran disjunctions.

Typus: *Agrostietalia castellanae* Rivas-Martínez in Rivas-Martínez, Costa, Castroviejo & Valdés-Bermejo 1980 (45a.).

Characteristic species: *Agrostis castellana*, *Dactylis glomerata* subsp. *lusitanica*, *Festuca paniculata* subsp. *multispiculata*, *Gaudinia fragilis* var. *fragilis*, *Linum bienne*, *Malva tournefortiana*, *Sanguisorba verrucosa*.

- 45a. AGROSTIETALIA CASTELLANAE** Rivas-Martínez in Rivas-Martínez, Costa, Castroviejo & Valdés-Bermejo 1980

Meadows and perennials grasslands rich in therophytes, on deep soils poor in bases, in rainy areas of Mediterranean West Iberian and Orocantrabrian, locally reaching North Africa.

Typus: *Agrostion castellanae* Rivas Goday 1957 corr. Rivas Goday & Rivas-Martínez 1963 (45.1.).

Characteristic species: *Allium guttatum* subsp. *sardoum*, *Armeria segoviensis*, *Carex divisa* var. *chaetophylla*, *Festuca durandoi* subsp. *livida*, *Ranunculus gramineus*, *Rumex angiocarpus*, *Rumex papillaris*, *Serapias lingua*, *Serapias parviflora*, *Thapsia villosa*.

- 45.1. Agrostion castellanae** Rivas Goday 1957 corr. Rivas Goday & Rivas-Martínez 1963

Grazed grasslands often in sandy or loamy acid siliceous soils with a possible slight flooding time, in thermo to suprasediterranean dry to humid bioclimate, and Mediterranean West Iberian distribution.

Typus: *Asphodelo aestivi-Armerietum gaditanae* Allier & Bresset 1977 corr. Rivas-Martínez, T.E. Díaz, Fernández González, Izco, Loidi, Lousã & Penas 2002 (45.1.2.).

Characteristic species: *Armeria gaditana*, *Asphodelus aestivus*, *Asphodelus bento-rainhae* subsp. *bento-rainhae*, *Avenula lodunensis* subsp. *cintrana*, *Avenula lodunensis* subsp. *gaditana*, *Festuca ampla* subsp. *ampla*, *Holcus annuus* subsp. *annuus*, *Narцissus willkommii*, *Thapsia minor*, *Trifolium cernuum*, *Trifolium retusum*.

- 45.1.1. *Armerio daveaui-Agrostietum castellanae* Aguiar, Monteiro-Henriques & Sánchez-Mata in Lazaroa 33, 2012
- 45.1.2. *Asphodelo aestivi-Armerietum gaditanae* Allier & Bresset 1977 corr. Rivas-Martínez, T.E. Díaz, Fernández González, Izco, Loidi, Lousã & Penas 2002
[*Asphodelo cerasiferi-Armerietum gaditanae* Allier & Bresset 1977]
- 45.1.3. *Centaureo coutinhoi-Agrostietum castellanae* Antunes, Aguiar & J.C. Costa ined. [in Quercetea 11:]
- 45.1.4. *Centaureo exilis-Agrostietum castellanae* Antunes, Aguiar & J.C. Costa ined. [in Quercetea 11:]
- 45.1.5. *Festuco amplae-Agrostietum castellanae* Rivas-Martínez in Rivas-Martínez & Belmonte 1986
- 45.1.6. *Gaudinio fragilis-Agrostietum castellanae* Rivas-Martínez & Belmonte 1985

45.1.7. *Narcisso willkommii-Festucetum amplae* Rosa Pinto, Pinto-Gomes & P. Ferreira in Pinto-Gomes & P. Ferreira in Flora e Vegetação do Barrocal Algarvio. Tavira-Portimão: 232, 2005

45.1.8. *Sedo forsterani-Agrostietum castellanæ* Tüxen & Oberdorfer 1958 nom. mut.
[*Sedo elegantis-Agrostietum castellanæ* Tüxen & Oberdorfer 1958]

45.1.9. *Violo riviniana-Agrostietum castellanæ* J.C. Costa, Capelo, Jardim, Sequeira, & Rivas-Martínez ass. nova hoc loco
[*Hypochaerido glabrae-Agrostietum castellanæ* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 nom. inval. (art.3b); *Violo riviniana-Agrostietum castellanæ* J.C. Costa, Capelo, Jardim, Sequeira, Espírito Santo, Lousã, Fontinha, Aguiar & Rivas-Martínez in Quercetea 6: 109, 2004 nom. inval. (art. 3b)]

45.2. *Festucion merinoi* Rivas-Martínez & Sánchez-Mata in Rivas-Martínez, Fernández-González & Sánchez-Mata 1986 corr. Rivas-Martínez & Sánchez-Mata 2002
[*Festucion elegantis* Rivas-Martínez & Sánchez-Mata in Rivas-Martínez, Fernández-González & Sánchez-Mata 1986]

Grasslands on sandy or sandy-loamy acids soils that do not support temporal hydromorphy, in supramediterranean subhumid-humid and supratemperate (rarely upper mesotemperate) submediterranean humid to ultrahyperhumid bioclimate and a Mediterranean West Iberian and Orocatabrian distribution.

Typus: Leucanthemopsis pallidae-Festucetum merinoi Rivas-Martínez & Sánchez-Mata in Rivas-Martínez, Fernández-González & Sánchez-Mata 1986 corr. Rivas-Martínez & Sánchez-Mata in Itinera Geobot. 18(1): 291, 2011.

Characteristic species: *Armeria beirana*, *Festuca elegans* subsp. *merinoi*, *Phalacrocarpon hoffmannseggii*, *Phalacrocarpon oppositifolium*, *Ranunculus nigrescens*.

45.2.1. *Arrhenathero bulbosi-Armerietum beiranae* Monteiro-Henriques, J.C. Costa, A. Bellu & Aguiar ass. nova hoc loco

45.2.2. *Centaureo lusitanae-Pseudarrhenatheretum longifolii* Monteiro-Henriques, J.C. Costa, Aguiar, Honrado ass. nova hoc loco

45.2.3. *Centaureo rothmaleranae-Celticetum giganteae* Meireles & Pinto-Gomes in Pinto-Gomes, P. Ferreira & Meireles in Lazaroa 31: 61, 2010

45.2.4. *Festuco multispiculatae-Agrostietum curtisii* Vicente & Galán in Acta Bot. Malacitana 33: 185-186, 2008

45.2.5. *Phalacrocarpo hoffmannseggii-Festucetum merinoi hoffmannseggii-Festucetum* Aguiar ass. nova hoc loco
[*Phalacrocarpo hoffmannseggii-Festucetum elegantis* Aguiar 2001 nom. inval. (art.1)]

45.2.5. *Phalacrocarpo oppositifolii-Festucetum merinoi* Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas in E. Puente 1988 corr. Rivas-Martínez & Sánchez-Mata 2011

[*Phalacrocarpo oppositifolii-Festucetum elegantis* Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas in E. Puente 1988]

45.3. *Agrostio castellanæ-Celticion giganteae* Rivas Goday ex Rivas-Martínez & Fernández-González 1991 nom. mut.
[*Agrostio castellanæ-Stipion giganteae* Rivas Goday ex Rivas-Martínez & Fernández-González 1991]

Communities dominated by perennial grasses on deep arenosols and cambisols, without temporary hydromorphy, thermo to supramediterranean dry to subhumid. Mediterranean West Iberian and Coastal Lusitanian-Andalusian distribution.

Typus: Arrhenathero baetici-Celticetum giganteae Rivas-Martínez in Rivas-Martínez, Fernández-González & Sánchez-Mata 1986 nom. mut. (45.3.3.).

Characteristic species: *Armerio x francoi*, *Arrhenatherum album* var. *erianthum*, *Arrhenatherum baeticum*, *Celtica gigantea* subsp. *gigantea*, *Celtica gigantea* subsp. *sterilis*, *Centaurea aristata* subsp. *langeana*, *Elaeoselinum gummiferum*, *Euphorbia oxyphylla*, *Helictotrichon hackelii* subsp. *hackelii*, *Helictotrichon hackelii* subsp. *stenophylla*, *Stipa lasgascae*.

45.3.1. *Armerio francoi-Arrhenatheretum sardo* Vicente & Galán in Acta Bot. Malacitana 33: 185, 2008

45.3.2. *Armerio macrophyllae-Celticetum giganteae* P. Ferreira, Pinto-Gomes & R. Pinto in Pinto-Gomes, P. Ferreira & Meireles in Lazaroa 31: 61, 2010

45.3.3. *Arrhenathero baetici-Celticetum giganteae* Rivas-Martínez in Rivas-Martínez, Fernández-González & Sánchez-Mata 1986 nom. mut.
[*Arrhenathero baetici-Stipetum giganteae* Rivas-Martínez in Rivas-Martínez, Fernández-González & Sánchez-Mata 1986]

45.3.4. *Arrhenathero erianthi-Celticetum giganteae* Antunes, Aguiar & J.C. Costa ined. [in Quercetea 11:]

45.3.5. *Avenulo hackelii-Celticetum sterilis* Pinto-Gomes & P. Ferreira in Pinto-Gomes, P. Ferreira & Meireles in Lazaroa 28: 67, 2007

45.3.6. *Avenulo occidentalis-Celticetum giganteae* P. Ferreira in Pinto-Gomes, P. Ferreira & Meireles in Lazaroa 28: 67, 2007

45.3.7. *Avenulo lodunensis-Celticetum giganteae* J.C. Costa, Capelo, Lousã & Espírito Santo 2002 nom. mut. prop.
[*Avenulo sulcatae-Stipetum giganteae* J.C. Costa, Capelo, Lousã & Espírito Santo in Quercetea 3: 86, 2002]

45.3.8. *Centaureo coutinhoi-Dactyletum lusitanici* Meireles & Pinto-Gomes in Pinto-Gomes, P. Ferreira & Meireles in Lazaroa 31: 61, 2010

45.3.9. *Euphorbio transtaganae-Celticetum giganteae* Pinto-Gomes, P. Ferreira, Mendes & Cano in Pinto-Gomes, P. Ferreira & Meireles in Lazaroa 28: 67, 2007 (fig. 34, page 109)

45.3.10. *Melico magnolii-Celticetum giganteae* Rivas Goday & Rivas-Martínez ex Peinado & Martínez-Parras 1985 nom. mut.

[*Melico magnolii-Stipetum giganteae* Rivas Goday & Rivas-Martínez ex Peinado & Martínez-Parras 1985]

45.3.11. *Pseudarrhenathero longifolii-Celticetum giganteae* Honrado & P. Alves ass. nova hoc loco

45.3.12. *Serratulo flavescens-Celticetum giganteae* Pinto-Gomes & P. Ferreira in Pinto-Gomes, P. Ferreira & Meireles in Lazaroa 31: 59, 2010

45b. PARAFESTUCETALIA ALBIDAE Rivas-Martínez, Capelo, J.C. Costa, Lousã, Fontinha, Jardim & Sequeira 2002

Siliceous perennial grasslands on shallow soils, in supratemperate submediterranean hyperhumid to ultrahyperhumid summit zone of Madeira.

Typus: *Deschampsio maderensis-Parafestucion albidae* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 (45.4.).

45.4. Deschampsio maderensis-Parafestucion albidae Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000

Single alliance.

Typus: *Armerio maderensis-Parafestucetum albidae* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 (45.4.1.).

Characteristic species: *Agrostis obtusissima*, *Anthoxanthum maderensis*, *Anthyllis lemmaniana*, *Armeria maderensis*, *Deschampsia maderensis*, *Festuca jubata*, *Orchis scopulorum*, *Parafestuca albida*, *Rumex bucephalophorus* subsp. *fruticescens*.

45.4.1. *Armerio maderensis-Parafestucetum albidae* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000

VIIc. MEADOW AND CHIONOPHILOUS GRASSLAND VEGETATION

46. MOLINIO-ARRHENATHERETEA Tüxen 1937

Dense vegetation of meadows and reeds that grows in deep wet soils, but rarely is submerged. Composed by perennial species, mostly hemicryptophytes that sometimes are exploited by man. Normally, constitutes a step substitution of the anthropic riparian deciduous forests of *Salici-Populetea nigrae*, in Eurosiberian and Mediterranean territories.

Typus: *Arrhenatheretalia elatioris* Tüxen 1931 (46b).

Characteristic species: *Agrostis capillaris*, *Agrostis x fouilladei*, *Alopecurus pratensis*, *Anthoxanthum odoratum*, *Arrhenatherum elatius* subsp. *bulbosum*, *Cardamine pratensis*, *Carex distans*, *Carex flacca*, *Cerastium fontanum* subsp. *vulgare*, *Crepis capillaris*, *Dactylis glomerata*, *Dactylorhiza elata* subsp. *sesquipedalis*, *Holcus lanatus*, *Knautia arvensis*, *Lathyrus pratensis*, *Linum*

angustifolium, *Lotus corniculatus* subsp. *corniculatus*, *Oenanthe lachenalii*, *Orchis coriophora* subsp. *coriophora*, *Orchis coriophora* subsp. *martrinii*, *Orchis laxiflora*, *Phleum pratense* subsp. *bertolonii*, *Plantago lanceolata*, *Poa pratensis*, *Poa trivialis* subsp. *trivialis*, *Prunella vulgaris*, *Rhinanthus minor*, *Rumex acetosa* subsp. *acetosa*, *Schoenus nigricans*, *Senecio jacobea*, *Trifolium pratense*, *Trifolium resupinatum*.

46a. MOLINIETALIA CAERULEAE Koch 1926

Temperate hygrophilous meadows, colonizing moist oligotrophic or mesotrophic soils with gley, little or not fertilized, and when late harvested once a year. Atlantic-Central European, Alpine-Caucasian, Mediterranean West Iberian distribution and Maghrebi disjunctions.

Typus: *Molinion caeruleae* Koch 1926.

Characteristic species: *Carex panicea*, *Centaurea nigra* subsp. *rivularis*, *Cirsium palustre*, *Dactylorhiza maculata* subsp. *maculata*, *Deschampsia caespitosa* subsp. *caespitosa*, *Equisetum palustre*, *Festuca trichophylla*, *Gymnadenia conopsea*, *Juncus acutiflorus* subsp. *acutiflorus*, *Juncus articulatus*, *Juncus conglomeratus*, *Juncus effusus*, *Juncus fontanesii*, *Juncus subnodulosus*, *Lobelia urens*, *Lotus pedunculatus*, *Lychnis flos-cuculi*, *Molinia caerulea* subsp. *caerulea*, *Poa trivialis* subsp. *sylvicola*, *Ranunculus flammula*, *Senecio aquaticus*, *Succisa pratensis*, *Valeriana dioica*.

46.1. Calthion palustris Tüxen 1937

Temperate hygrophilous meadows, colonizing mostly oligotrophic or mesotrophic soils with gley, slightly or not fertilized and when, late harvested once a year. Atlantic-Central European, Alpine-Caucasian, Mediterranean West Iberian distribution and Maghrebi disjunctions.

Typus: *Angelico sylvestris-Cirsietum oleracei* Tüxen 1937.

Characteristic species: *Bromus racemosus*, *Caltha palustris* subsp. *palustris*, *Polygonum bistorta*.

46.1.1. *Loto pedunculati-Juncetum conglomerati* Herrera & F. Prieto in T.E. Díaz & F. Prieto 1994

46.2. Juncion acutiflori Br.-Bl. in Br.-Bl. & Tüxen 1952

Hygrophytic meadows and rushes that can support a mild summer dryness on acid oligo-mesotrophic soils. Atlantic European Mediterranean, West Iberian, Tintangan and Madeiran distribution, in thermo to supratemperate and thermo to oromediterranean subhumid to ultrahyperhumid hyperoceanic to semicontinental bioclimate.

Typus: *Senecioni aquatici-Juncetum acutiflori* Br.-Bl. & Tüxen 1952 (46.2.11.).

Characteristic species: *Carex binervis*, *Carex viridula* subsp. *cedercreutzii* (dif.), *Carum verticillatum*, *Deschampsia gallaecica*, *Galium rivulare*, *Hypericum undulatum*, *Juncus acutiflorus* subsp. *rugosus*, *Juncus valvatus*, *Scorzonera fistulosa*, *Scutellaria minor*, *Serapias cordigera*, *Silene laeta*.

46.2.1. *Carici cedercreutzii-Juncetum effusi* J.C. Costa, Capelo, Jardim, Sequeira, Lousã, Espírito Santo & Rivas-Martínez in Silva Lusit. 11(2): 251, 2003

- 46.2.2. *Cirsio palustris-Juncetum rugosi* Neto, Capelo, J.C. Costa & Lousã 1996
- 46.2.3. *Deschampsio gallaecicae-Juncetum effusi* Honrado & Aguiar in Honrado, P. Alves, Nepomuceno & B. Caldas in *Quercetea* 5: 35, 2004
- 46.2.4. *Deschampsio hispanicae-Juncetum effusi* Rivas-Martínez ex Garcia Cachán in Llamas 1985
- 46.2.5. *Hyperico undulati-Juncetum acutiflori* Teles 1970
- 46.2.6. *Hyperico undulati-Juncetum conglomerati* J.C. Costa, Capelo, Jardim, Sequeira, Lousã, Espírito Santo & Rivas-Martínez in *Silva Lusit.* 11(2): 252, 2003
- 46.2.7. *Juncetum acutifloro-valvati* Espírito Santo & Capelo 1996
- 46.2.8. *Juncetum rugoso-effusi* Rivas-Martínez & Costa in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980
- 46.2.9. *Peucedano lancifolii-Juncetum acutiflori* Teles 1970
- 46.2.10. *Selino broteri-Molinietum caeruleae* P. Alves, Aguiar & Honrado ass. nova hoc loco
- 46.2.11. *Senecioni aquatici-Juncetum acutiflori* Br.-Bl. & Tüxen 1952
- 46b. ARRHENATHERETALIA ELATIORIS** Tüxen 1931
Hygrophilous cut and grazed meadows, very productive, eutrophic to mesotrophic, fertilized, under temperate bioclimate in well-drained fertile soils, mainly Eurosiberian.
Typus: Arrhenatherion elatioris Koch 1926 (46.3.).
Characteristic species: *Achillea millefolium*, *Avenula pubescens*, *Taraxacum officinale*, *Trifolium dubium*, *Trisetum flavescens*.
- 46.3. Arrhenatherion elatioris** Koch 1926
Meadows that are submitted to cutting at least twice a year, on mesotrophic soils without permanent hydromorphy (only a slight temporal hydromorphy). Presents Atlantic-Central European and Alpine-Caucasian distribution, in meso to supratemperate subhumid to hyperhumid hyperoceanic to moderate continental bioclimate.
Typus: Arrhenatheretum elatioris Br.-Bl. 1915.
Characteristic species: *Arrhenatherum elatius* subsp. *elatius*, *Galium album*, *Heracleum sphondylium* subsp. *sphondylium*.
- 46.1. *Agrostio castellanae-Arrhenatheretum bulbosi* Teles 1970 (fig. 35, page 110)
- 46.4. Cynosurion cristati** Tüxen 1947
Mesophilous pastures developed by intensive grazing of cattle, on mostly mesotrophic and eutrophic soils, slightly acid to neutral. Atlantic-Central European and Alpine-Caucasian distribution, in thermo to orotemperate subhumid to hyperhumid bioclimate.
Typus: Lolio perennis-Cynosuretum cristati Br.-Bl. & De Leeuw 1936.
Characteristic species: *Bellis perennis*, *Cynosurus cristatus*, *Dactylorhiza maculata* subsp. *caramulensis*, *Leontodon autumnalis*, *Phleum pratense* subsp. *pratense*, *Trifolium repens* subsp. *repens*, *Veronica serpyllifolia* subsp. *serpyllifolia*.
- 46.4.1. *Agrostio-Cynosuretum cristati* Teles 1957
- 46.4.2. *Anthemido nobilis-Cynosuretum cristati* Teles 1970 (fig.36, page 111)
- 46.4.3. *Caro verticillati-Cynosuretum cristati* Tüxen in Tüxen & Oberdorfer 1958
- 46c. HOLOSCHOENETALIA VULGARIS** Br.-Bl. ex Tchou 1948
Mediterranean meadows and rushes growing on moist and deep soils.
Typus: Molinio arundinacea-Holoschoenion vulgaris Br.-Bl. ex Tchou 1948 (46.5.).
Characteristic species: *Achillea ageratum*, *Blackstonia perfoliata*, *Cirsium pyrenaicum*, *Cyperus eragrostis*, *Festuca arundinacea* subsp. *mediterranea*, *Hypericum pubescens*, *Jasonia tuberosa*, *Melilotus indicus*, *Oenanthe pimpinelloides*, *Phalaris aquatica*, *Pulicaria dysenterica* var. *ramosissima*, *Scirpoides holoschoenus* subsp. *holoschoenus*, *Trifolium lappaceum*.
- 46.5. Molinio arundinacea-Holoschoenion vulgaris** Br.-Bl. ex Tchou 1948
Hygrophytic meadows and rushes on moist permeable soils, that maintain the water table very close to the surface. Mediterranean distribution in thermo to supramediterranean semiarid to humid bioclimate.
Typus: Cirsio monspessulani-Holoschoenetum vulgaris Br.-Bl. ex Tchou 1948.
Characteristic species: *Cochlearia glastifolia*, *Dorycnium rectum*, *Erica erigena*, *Euphorbia hirsuta*, *Festuca arundinacea* subsp. *fenas*, *Hypericum tomentosum*, *Linum tenue*, *Lysimachia ephemerum*, *Molinia caerulea* subsp. *arundinacea*, *Ranunculus bulbosus* subsp. *aleae*, *Ranunculus macrophyllus*, *Sonchus aquatilis*, *Thalictrum speciosissimum*.
- 46.5a. Brizo minoris-Holoschoenion vulgaris** (Rivas Goday 1964) Rivas-Martínez in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980
Neutral and slightly acidic thermo to supramediterranean communities. Mediterranean West Iberian, Coastal Lusitanian-Andalusian, Madeiran and Canarian distribution.
Typus: Trifolio resupinati-Holoschoenetum vulgaris Rivas Goday 1964 (46.5.6.).
Characteristic species: *Agrostis reuteri*, *Galium debile*, *Scirpoides holoschoenus* subsp. *australis*, *Serapias vomeracea*.
- 46.5.1. *Festuco amplae-Brachypodietum phoenicoidis* S. Ribeiro, Ladero & Espírito-Santo ined. [Plant Biosystem]
- 46.5.2. *Galio palustris-Juncetum maritimi* Rivas-Martínez & Costa in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980

46.5.3. *Holoschoeno-Juncetum acuti* Rivas-Martínez & Costa in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980

46.5.5. *Phalarido coerulescentis-Juncetum acuti* J.C. Costa, Capelo, Jardim, Sequeira, Lousã, Espírito Santo & Rivas-Martínez in Silva Lusit. 11(2): 252, 2003

46.5.6. *Trifolio resupinati-Holoschoenetum vulgaris* Rivas Goday 1964

46.5b. Ericenion terminali-erigenae Rivas-Martínez, Salazar, A. García & F. Valle in Itinera Geobot. 18(1): 298, 2011

Shrub and rush communities and peaty sites with metals, thermo to suprasediterranean, subhumid to humid, in the Southwest Iberian Peninsula.

Typus: Hyperico caprifolii-Ericetum erigenae Salazar, A. García F. Valle & Rivas-Martínez in Rivas-Martínez in Itinera Geobot. 18(1): 298, 2011.

Characteristic species: *Erica andevalensis*.

46.5.7. *Junco rugosi-Ericetum andevalensis* Cabezu-do, Nieto & A.V. Pérez 1989

46.6. Gaudinio verticolae-Hordeion bulbosae Galán, Deil, Haug & Vicente 1997 corr. Rivas-Martínez, T.E. Díaz, Fernández-González, Izco, Loidi, Lousã & Penas 2002

Communities in wet vertisols, thermo to mesomediterranean dry sub-humid, Tingitanan, Baetic, Lusitanian-Extremadurean and Coastal Lusitanian-Andalusian.

Typus: Hedysaro coronarii-Phalaridetum coerulescentis Galán, Deil, Haug & Vicente 1997.

Characteristic species: *Gaudinia fragilis* var. *verticola*, *Hordeum bulbosum*, *Phalaris coerulescens* subsp. *coerulescens*, *Phalaris coerulescens* subsp. *lusitanica*.

46.6.1. *Arabido lusitanicae-Hordeetum bulbosae* Espírito Santo, J.C. Costa & P. Arsénio in J.C. Costa, Espírito Santo & P. Arsénio in Quercetea 10: 40, 2010

46.6.2. *Bituminario bituminosae-Phalaridetum coerulescentis* J.C. Costa, Capelo, Jardim & Sequeira ass. nova hoc loco

46.6.3. *Senecio foliosae-Phalaridetum coerulescentis* Cano-Ortiz, Pinto-Gomes & Cano in Acta Bot. Gallica 155 (1): 22, 2009

46.6.4. *Trifolio pratensis-Phalaridetum lusitanicae* J.C. Costa, Espírito Santo & P. Arsénio in Quercetea 10: 40, 2010

46d. PLANTAGINETALIA MAJORIS Tüxen & Preising in Tüxen 1950

[*Paspalo-Heleochoetalia* Br.-Bl. in Br.-Bl., Roussine & Nègre 1952; *Crypsio-Paspaletalia distichi* Br.-Bl. in Br.-Bl., Roussine & Nègre 1952 nom. mut]

Meadows and perennial grasslands, grazed and trampled, in high humidity, often temporarily flooded, soils, enriched in nitrogen (organic and mineral) and phosphorus, in Mediterranean and temperate areas.

Typus: Potentillion anserinae Tüxen 1947 (46.12.).

Characteristic species: *Agrostis stolonifera* var. *scabriglumis*, *Agrostis stolonifera* var. *stolonifera*, *Carex*

hirta, *Epilobium tetragonum* subsp. *tournefortii*, *Hypochaeris radicata* subsp. *radicata*, *Juncus compressus*, *Lepidium latifolium*, *Lolium multiflorum*, *Lolium perenne*, *Lotus glaber*, *Plantago major* subsp. *major*, *Potentilla anserina*, *Potentilla reptans*, *Ranunculus repens*, *Rumex conglomeratus*, *Rumex crispus*, *Rumex obtusifolius*, *Sporobolus indicus*, *Verbena officinalis*.

46.7. Paspalo-Polypogonion viridis Br.-Bl. in Br.-Bl., Roussine & Nègre 1952 nom. mut.

[*Paspalo-Agrostion verticillati* Br.-Bl. in Br.-Bl., Roussine & Nègre 1952]

Grasslands dominated by decumbent grasses growing on very moistly soils, along rivers with rich waters in nitrogen and phosphorus. Northern Mediterranean and Cantabrian-Atlantic distribution, in thermo-mesomediterranean bioclimate.

Typus: Paspalo distichi-Polypogonetum viridis Br.-Bl. in Br.-Bl., Gajewski, Wraber & Walas 1936 nom. mut. (46.7.2.).

Characteristic species: *Lythrum junceum*.

46.7a. Paspalo distichi-Polypogonion viridis Rivas-Martínez, Fernández González & Loidi in Itinera Geobot. 18(1): 300, 2011.

[*Paspalo-Polypogonion semiverticillati* Rivas-Martínez, Fernández González & Loidi 1999 nom. inval.]

Freshwater meadows.

Typus: Paspalo distichi-Polypogonetum viridis Br.-Bl. in Br.-Bl., Gajewski, Wraber & Walas 1936 nom. mut. (46.7.2.).

Characteristic species: *Paspalum dilatatum*, *Paspalum distichum*, *Polypogon viridis*.

46.7.1. *Paspaleetum dilatato-distichi* Herrera & F. Prieto in T.E. Díaz & F. Prieto 1994

46.7.2. *Paspalo distichi-Polypogonetum viridis* Br.-Bl. in Br.-Bl., Gajewski, Wraber & Walas 1936 nom. mut.

[*Paspalo distichi-Agrostietum verticillatae* Br.-Bl. in Br.-Bl., Gajewski, Wraber & Walas 1936]

46.7.3. *Ranunculo scelerati-Paspaleetum paspalodis* Rivas Goday 1964 corr. Peinado, Bartolomé, Martínez-Parras & Ollala 1988

[ass. *Paspalum vaginatum* et *Ranunculus sceleratus* Rivas Goday 1964, *Heliotropio supini-Paspaleetum paspalodis* Martínez-Parras, Peinado, Bartolomé & Molero 1988, *Ranunculo scelerati Paspaleetum distichi* Rivas Goday 1964 corr. Peinado, Bartolomé, Martínez-Parras & Ollala 1988 nom. mut]

46.7b. Spergulario marinae-Paspalenion vaginati Bueno & F. Prieto in Bueno 1997

Meadows flooded by salt or brackish waters.

Typus: Agrostio pseudopungentis-Paspaleetum vaginati Bueno & F. Prieto in Bueno 1997 (46.7.4.).

Characteristic species: *Cotula coronopifolia*, *Paspalum vaginatum*.

46.7.4. *Agrostio pseudopungentis-Paspaleetum vaginati* Bueno & F. Prieto in Bueno 1997

46.7.5. *Triglochino striatae-Cotuletum coronopifoliae* P. Alves in Quercetea 4: 152, 2004 (fig. 37, page 110)

46.8. *Lolio-Plantaginion majoris* Sissingh 1969

Hygrophytic meadows on moist compacted soils and trampled pastures enriched in nitrogen. They present an Eurosiberian optimum in thermo to orotemperate bioclimate.

Typus: Lolio perennis-Plantaginietum majoris Beger 1930.

Characteristic species: *Chamaemelum nobile*, *Juncus tenuis*.

46.8.1. *Juncetum tenuis* Diemont, Sissingh & Westhoff ex Tüxen 1950 nom. mut.

[*Juncetum macri* Diemont, Sissingh & Westhoff ex Tüxen 1950]

46.8.2. *Lolietum perennis* Gams 1927

[*Lolio perennis-Plantaginietum majoris* Beger 1930]

46.8.3. *Loto pedunculati-Plantaginietum majoris* J.C. Costa, Capelo, Jardim, Sequeira, Lousã, Espírito Santo & Rivas-Martínez in Silva Lusit. 11(2): 252, 2003

46.9. *Trifolio fragiferi-Cynodontion dactyli* Br.-Bl. & O Bolòs 1958

Clovers and *Cynodon dactylon* meadows on mesotrophic to eutrophic soils rich in nitrogen and phosphorus, evolved from intensive grazing by cattle rushes. West Mediterranean.

Typus: Trifolio fragiferi-Cynodontetum dactyli Br.-Bl. & O Bolòs 1958 (46.9.1.).

Characteristic species: *Carex divisa* subsp. *divisa*, *Cynodon dactylon*, *Cyperus laevigatus* subsp. *distachyos*, *Hyacinthoides vicentina* subsp. *transtagana*, *Lactuca saligna*, *Medicago arabica*, *Trifolium fragiferum*.

46.9.1. *Trifolio fragiferi-Cynodontetum dactyli* Br.-Bl. & O Bolòs 1958

46.9.2. *Trifolio resupinati-Caricetum chaetophyllae* Rivas-Martínez & Costa in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980

46.10. *Agrostion stoloniferae* Görs 1966

Perennial grass meadows on fluvisols of temporarily flooded river beds with deposition of inorganic compounds (nitrites, nitrates, phosphates, ammonia, etc.) that fertilize the soil. Atlantic-Central European distribution, in thermo to supratemperate sub-humid to humid bioclimate.

Typus: Rorippo sylvestris-Agrostietum stoloniferae Oberdorfer & Müller 1961.

Characteristic species: *Alopecurus geniculatus*, *Carex viridula* subsp. *viridula*, *Festuca arundinacea* subsp. *arundinacea*, *Rorippa sylvestris*.

46.10.1. *Gaudinio fragilis-Agrostietum stoloniferae* Rivas-Martínez, Izco, Amigo & Pulgar in Itinera Geobot. 18(1): 301, 2011

46.10.2. *Plantagini coronopodi-Trifolietum fragiferi* Tüxen ex T.E. Díaz 1975

46.11. *Poion supinae* Rivas-Martínez & Géhu 1978

Perennial trampled or grazed grasslands near the places where the cattle drinks, supra to orotemperate and oromediterranean.

Typus: Plantagini majoris-Poetum supinae Rivas-Martínez & Géhu 1978.

Characteristic species: *Poa supina*, *Spergularia capillacea*, *Veronica serpyllifolia* subsp. *humifusa*.

46.11.1. *Spergulario capillaceae-Poetum supinae* Rivas-Martínez 1981

46.12. *Potentillion anserinae* Tüxen 1947

[*Mentho-Juncion inflexi* Müller & Görs 1969]

Meadows and rushes, in hydrophilic soils often soggy and strongly nitrophilous.

Typus: Ranunculo repentis-Alopecuretum geniculati Tüxen 1937.

Characteristic species: *Carex cuprina*, *Cyperus longus* subsp. *badius*, *Epilobium tetragonum* subsp. *tetragonum*, *Juncus inflexus*, *Mentha longifolia*, *Mentha suaveolens*.

46.12.1. *Cypero badii-Menthetum suaveolentis* S. Ribeiro, Ladero & Espírito-Santo ined. [Plant Biosystem]

46.12.2. *Mentho pulegii-Cyperetum badii* S. Ribeiro, Ladero & Espírito-Santo ined. [Plant Biosystem]

46.12.3. *Mentho suaveolentis-Holcetum lanati* S. Ribeiro, Ladero & Espírito-Santo ined. [Plant Biosystem]

46.12.4. *Mentho suaveolentis-Juncetum inflexi* Rivas-Martínez in Sánchez-Mata 1989

46.12.5. *Rumici obtusifolii-Oenanthetum crocatae* Ortiz & J. Rodríguez 1987

47. *NARDETEA* Rivas Goday in Rivas Goday & Rivas-Martínez 1963

Anthropic dense acidic grasslands, intensively grazed, and in climatophilous swards of high mountains in the upper timberline zone with a long period of snow on the ground. They present a vernal development in deep moistly soils, turfophilous, mineralized and strongly acidified by organic matter. In Western Eurosiberian and Western Mediterranean territories, in thermo to criotemperate and supra-oromediterranean, subhumid to hyperhumid, moderate hyperoceanic to moderate continental bioclimate.

Typus: Nardetalia strictae Oberdorfer ex Preising 1949 (47a.).

Characteristic species: *Gagea soleirolii* (*Gagea nevadensis*), *Ophioglossum azoricum*, *Scilla verna*.

47a. *NARDEALIA STRICTAE* Oberdorfer ex Preising 1949

Single order in Europe with a disjunction distribution in Atlas mountains (North Africa).

Typus: Nardo strictae-Galium saxatile Preising 1949.

Characteristic species: *Ajuga pyramidalis* subsp. *meonantha*, *Ajuga pyramidalis* subsp. *pyramidalis*, *Carex leporina*, *Carex pallescens*, *Carex pilulifera* subsp. *pilulifera*, *Danthonia decumbens*, *Euphrasia hirtella*, *Festuca nigrescens* subsp. *microphylla*, *Festuca rivularis*, *Galium saxatile* subsp. *saxatile*, *Galium saxatile* subsp. *vivianum*, *Gentiana pneumonanthe* subsp. *pneumonanthe*, *Juncus squarrosus*, *Luzula multiflora* subsp. *multiflora*, *Nardus stricta*, *Pedicularis sylvatica* subsp. *sylvatica*, *Potentilla erecta* var. *erecta*, *Stellaria graminea*.

47aa. *NARDENALIA STRICTAE*

Western Eurosiberian communities.

Typus: *Nardo strictae-Galium saxatilis* Preising 1949.

Characteristic species: *Erythronium dens-canis*.

47.1 *Violion caninae* Schwickerath 1944

Grazed meso-hygrophilous and acidophilous communities, seral of *Quercetalia roboris* and *Fagetalia sylvatica*, with an Atlantic-Central European distribution and thermo to supratemperate subhumid to hyperhumid bioclimate.

Typus: *Festuco rubrae-Genistetum sagittalis* Issler 1927.

Characteristic species: *Luzula multiflora* subsp. *congesta*, *Polygala vulgaris*, *Polygala serpyllifolia*, *Serratula tinctoria* var. *seoanei*, *Viola canina*.

47.1.1. *Agrostio hespericae-Nardetum strictae* Aguiar & Honrado in Honrado, P. Alves, Nepomuceno & B. Caldas in *Quercetea* 5: 36, 200447ab. *CAMPANULO HERMINII-NARDENALIA STRICTAE* Rivas-Martínez, Fernández-González & Sánchez-Mata 1986

Western Mediterranean communities.

Typus: *Plantaginion nivalis* Quézel 1953.

Characteristic species: *Campanula herminii*, *Carex furva*, *Festuca iberica*, *Hieracium pilosella* subsp. *tricholepium*, *Trifolium repens* subsp. *nevadensis*.

47.3. *Campanulo herminii-Nardion strictae* Rivas-Martínez 1963

Grazed grassland from high mountains, dominated by *Nardus stricta*, that in areas close to perpetual snow may represent meso-hygrophytes permanent communities. Distributed through Mediterranean West Iberian and Cantabrian-Atlantic territories and with a supra-oromediterranean and supra-orotemperate, subhumid to hyperhumid bioclimate.

Typus: *Campanulo herminii-Festucetum ibericae* Rivas-Martínez 1964.

Characteristic species: *Crocus carpetanus*, *Festuca henriquesii*, *Festuca rothmaleri*, *Gentiana lutea* subsp. *aurantiaca*, *Jasione laevis* subsp. *carpetana*, *Leontodon carpetanus* subsp. *carpetanus*, *Luzula campestris* subsp. *carpetana*, *Narcissus bulbocodium* subsp. *nivalis*, *Narcissus pseudonarcissus* subsp. *confusus*, *Ranunculus abnormis*, *Ranunculus bulbosus* subsp. *cacuminalis*.

47.3.1. *Campanulo herminii-Festucetum henriquesii* Rivas-Martínez 198147.3.2. *Campanulo herminii-Festucetum rivularis* Rivas-Martínez, Fernández-González, Sánchez-Mata & Sardiñero 200247.3.3. *Galio saxatilis-Nardetum* Br.-Bl., P. Silva, Rozeira & Fontes 195247.3.4. *Genisto anglicae-Nardetum strictae* Rivas-Martínez & Sánchez-Mata in Rivas-Martínez, Fernández-González, Sánchez-Mata 1986 (fig. 38, page 111)48. *TOLPIDO AZORICAE-HOLCETEA RIGIDI* F. Prieto & Aguiar in F. Prieto, Aguiar & Dias in *Int. J. Geobot. Res.* 2: 112. 2012

Non grazed perennial vascular plant communities of rocky and earthy scarps, slope deposits and natural forests fringes, dominated by endemic graminoids, hemi-cryptophytes and dwarf chamaephytic herbs. It is endemic of the thermomediterranean and thermo- to supratemperate belts of the Azorean biogeographic Province.

Typus: *Tolpido azoricae-Holcetalia rigidi* F. Prieto & Aguiar in F. Prieto, Aguiar & Dias 2012 (48a.).

Characteristic species: *Agrostis azorica*, *Brachypodium gaditanum*, *Carex guthnickiana*, *Carex vulcani*, *Centaureum scilloides*, *Holcus rigidus*, *Luzula purpureosplendens*, *Lysimachia azorica*, *Scabiosa nitens*, *Tolpis azorica*.

48a. *TOLPIDO AZORICAE-HOLCETALIA RIGIDI* F. Prieto & Aguiar in F. Prieto, Aguiar & Dias in *Int. J. Geobot. Res.* 2: 113. 2012

Single order.

Typus: *Festucion francoi* Lüpnitz 1976 corr. Fernández-Prieto, Aguiar, J.C. Costa, Lousã & Rivas-Martínez 2012 (48.1.).

48.1. *Festucion francoi* Lüpnitz 1976 corr. Fernández-Prieto, Aguiar, J.C. Costa, Lousã & Rivas-Martínez corr. F. Prieto, Aguiar & Dias in *Int. J. Geobot. Res.* 2: 113. 2012
[*Festucion jubatae* Lüpnitz 1976]

Meso-supratemperate, oligotrophic graminoid associations with scattered megaforbs in a matrix of endemic grasses, linked with habitats disturbed by soil mass flows or sweeping winds.

Typus: *Potentillo-Agrostietum azoricae* Lüpnitz 1976 corr. Rivas-Martínez, Lousã, F. Prieto, J.C. Costa, Dias & Aguiar 2002 (48.1.4.).

Characteristic species: *Agrostis congestiflora* subsp. *oreophila*, *Agrostis reuteri* subsp. *botelhoi*, *Deschampsia foliosa*, *Carex punctata*, *Euphrasia azorica*, *Euphrasia grandiflora*, *Festuca francoi*, *Leontodon filii*, *Leontodon rigens*, *Myosotis azorica*, *Veronica dabneyi*.

48.1.1. *Centaureo scilloides-Deschampsietum foliosae* F. Prieto, Aguiar & Dias in *Int. J. Geobot. Res.* 2: 113. 201248.1.2. *Festucetum francoi* Lüpnitz 1976 corr. Fernández-Prieto, Aguiar, J.C. Costa, Lousã & Rivas-Martínez corr. F. Prieto, Aguiar & Dias in *Int. J. Geobot. Res.* 2: 113. 2012
[*Festucetum jubatae* Lüpnitz 1976]48.1.3. *Lysimachio azoricae-Holcetum rigidi* F. Prieto, Aguiar & Dias in *Int. J. Geobot. Res.* 2: 113. 201248.1.4. *Potentillo-Agrostietum azoricae* Lüpnitz 1976 corr. Rivas-Martínez, Lousã, F. Prieto, J.C. Costa, Dias & Aguiar 2002
[*Potentillo rectae-Agrostietum castellanae* Lüpnitz 1976]48.1.5. *Tolpidetum azoricae* Lüpnitz 1976

48.2. *Tolpido succulentae-Agrostion congestiflorae*
 Aguiar & F. Prieto in F. Prieto, Aguiar & Dias
 in Int. J. Geobot. Res. 2: 114. 2012

Thermomediterranean, occasionally thermotemperate, perennial graminoid communities of cliffs and landslide scarps.

Typus: *Festuco petraeae-Agrostietum congestiflorae* F. Prieto & Aguiar in F. Prieto, Aguiar & Dias 2012 (48.2.1.).

Characteristic species: *Agrostis congestiflora*, *Agrostis gracililaxa*, *Festuca petraea* (ter.), *Euphorbia azorica* (ter.), *otus azoricus*, *Tolpis succulenta* (ter.).

48.2.1. *Festuco petraeae-Agrostietum congestiflorae*
 Aguiar & F. Prieto in F. Prieto, Aguiar &
 Dias in Int. J. Geobot. Res. 2: 114. 2012

48.2.2. *Holco rigidi-Brachypodietum gaditanae* Aguiar
 & F. Prieto in F. Prieto, Aguiar & Dias in Int. J.
 Geobot. Res. 2: 114. 2012

48.3. *Pericallion malvifoliae* F. Prieto, Dias & Aguiar
 in F. Prieto, Aguiar & Dias in Int. J. Geobot. Res.
 2: 114. 2012

Perennial herbs communities of semi-shaded well drained external fringes, of Azores endemic woodlands. Present in the thermomediterranean, meso- to supratemperate vegetation belts of the Azorean Province.

Typus: *Festuco petraeae-Pericallietum malvifoliae* F. Prieto, Dias & Aguiar in F. Prieto, Aguiar & Dias 2012 (48.3.1.).

Characteristic species: *Ammi seubertianum*, *A. trifoliatum*, *Angelica lignescens*, *Chaerophyllum azoricum*, *Lactuca watsoniana*, *Pericallis malvifolia*, *Ranunculus cortusifolius* (ter.)

48.3.1. *Festuco petraeae-Pericallietum malvifoliae*
 F. Prieto, Dias & Aguiar in Int. J. Geobot.
 Res. 2: 114. 2012

48.3.2. *Lactuco watsonianae-Tolpidetum azoricae*
 (Lüpnitz 1976) F. Prieto, Dias & Aguiar in F.
 Prieto, Aguiar & Dias in Int. J. Geobot. Res.
 2: 114. 2012
 [*Tolpidetum azoricae* subassoziation von *Lactuca
 watsoniana* Lüpnitz 1976]

48.3.3. *Agrostio azoricae-Angelicetum lignescens*
 F. Prieto, Dias & Aguiar in F. Prieto, Aguiar
 & Dias in Int. J. Geobot. Res. 2: 114. 2012

VIII. HEATHLAND, DWARF SCRUB AND SCRUB VEGETATION

VIIIa. HEATHLAND AND DWARF SCRUB VEGETATION

49. CALLUNO VULGARIS-ULICETEA MINORIS Br.-Bl. &
 Tüxen ex Klika & Hadač 1944

Heathland and moorland with dwarf shrubs, which constitute seral communities originated by firing, grazing or wood-cutting of acidic, deciduous or sclerophyllous meso-macroforests. Prosper on siliceous poor soils, eroded (dystrics cambisols or ferric podzols), rich in acid humus, and occasionally showing gleyic properties. In thermo to orotemperante and thermo to supramediterranean subhumid to ultrahyperhumid hyperoceanic-oceanic bioclimate. Distribution: Atlantic European, Cévennean-

Pyrenean, Mediterranean West Iberian, Oroiberian, Coastal Lusitanian-Andalusian and Tingitanan.

Typus: *Calluno-Ulicetalia minoris* Quantin ex Tüxen 1937 (49a.).

Characteristic species: *Agrostis curtisii*, *Allium ericetorum*, *Avenula lodunensis* subsp. *lodunensis*, *Calluna vulgaris*, *Erica cinerea*, *Erica scoparia*, *Halimium alyssoides*, *Halimium umbellatum*, *Lithodora prostrata*, *Scorzonera humilis*, *Simethis mattiazii*, *Tuberaria lignosa*, *Ulex europaeus* subsp. *latebracteatus* *Ulex minor*, *Viola lactea*.

49a. CALLUNO-ULICETALIA MINORIS Quantin ex Tüxen 1937

[*Ulicetalia minoris* Quantin 1935 nom. inval. (art.1); *Ulicetalia minoris* Br.-Bl. ex Rothmaler 1954]

Single order in Portugal.

Typus: *Ulicion minoris* Malcuit 1929.

49.1. *Ericion umbellatae* Br.-Bl., P. Silva, Rozeira &
 Fontes 1952 em. Rivas-Martínez 1979

[*Halimio-Ulicion* Rothmaler 1954; *Cistion hirsuti* Br.-Bl., P. Silva & Rozeira 1964]

Heathland and moorland dwarf scrub, thermo to supratemperate and thermo to supramediterranean subhumid to hyperhumid in Galician-Portuguese, Mediterranean West Iberian, Oroiberian and Sadensean-Dividing Portuguese territories.

Typus: *Junipero nanae-Ericetum aragonensis* Br.-Bl., P. Silva, Rozeira & Fontes 1952 (49.1.1.).

Characteristic species: *Cistus psilosepalus*, *Erica australis* subsp. *australis*, *Erica umbellata*, *Genista triacanthos*, *Halimium ocymoides*, *Lavandula viridis*, *Polygala microphylla*, *Pterospartum lasianthum*, *Thymelaea broteriana*, *Thymelaea procumbens*, *Tuberaria globularifolia*.

49.1a. *Ericenion aragonensis* Rivas-Martínez 1979

Supramediterranean and supratemperate submediterranean humid-hyperhumid euoceanic-semicontinental communities in Cantabrian-Leonese, Oroiberian and Oretanean areas.

Typus: *Junipero nanae-Ericetum aragonensis* Br.-Bl., P. Silva, Rozeira & Fontes 1952 (49.1.1.).

Characteristic species: *Erica australis* subsp. *aragonensis*, *Luzula lactea*.

49.1.1. *Junipero nanae-Ericetum aragonensis* Br.-Bl.,
 P. Silva, Rozeira & Fontes 1952 (fig. 39, page
 111)

49.1.2. *Pterosparto lasianthi-Ericetum aragonensis*
 Rothmaler 1954 corr. Rivas-Martínez, T.E.
 Díaz, Fernández González, Izco, Loidi, Lousã
 & Penas 2002

49.1.3. *Thymelaeo broterianae-Juniperetum alpinae*
 Honrado, P. Alves & B. Caldas ass. nova hoc
 loco

49.1b. *Ericenion umbellatae* Rivas-Martínez 1979

Thermo-mesomediterranean and thermo-supratemperate submediterranean, subhumid to hyperhumid hyperoceanic-euoceanic communities in Galician-Portuguese, Lower Beirensen, Lusitanian-Extremadurean and Sadensean-Dividing Portuguese territories.

Typus: *Halimio ocymoidis-Cistetum psilosepali* Br.-Bl., P. Silva & Rozeira 1965 nom. mut. (49.1.11.).

Characteristic species: *Pterospartum tridentatum*, *Ranunculus bupleuroides* subsp. *bupleuroides*, *Thymelaea villosa*, *Thymus lusitanicus*, *Thymus villosus*, *Ulex jussiaei* subsp. *jussiaei*, *Ulex micranthus*.

- 49.1.4. *Cisto-Ulicetum minoris* Br.-Bl., P. Silva & Rozeira 1965
- 49.1.5. *Carici piluliferae-Genistetum triacanthi* Honrado, P. Alves, B. Caldas in Silva Lusit. 13 (1): 127, 2005
- 49.1.6. *Erico australis-Cistetum populifolii* Rivas-Goday 1955
- 49.1.7. *Erico umbellatae-Pterospartetum tridentati* (Br.-Bl., P. Silva & Rozeira 1965) J.C. Costa, Honrado, Monteiro-Henriques & Aguiar in Silva Lusit. 16(1): 125, 2008 (fig. 40, page 111) [*Ulici minoris-Ericetum umbellatae pterospartetosum tridentatae* Br.-Bl., P. Silva & Rozeira 1964 em. Rivas-Martínez 1979 p.p; *Ulici minoris-Ericetum umbellatae tuberarietosum lignosae* Br.-Bl., P. Silva & Rozeira 1964 em. Rivas-Martínez 1979]
- 49.1.8. *Erico umbellatae-Ulicetum welwitschiani* Capelo, J.C. Costa, Neto & Lousã in J.C. Costa, Capelo, Neto, Espírito Santo & Lousã 1997 (fig. 41, page 111)
- 49.1.9. *Halimio calycinii-Ericetum australis* Deil, Galán & Vicente in Feddes Report. 119 (5-6): 577, 2008
- 49.1.10. *Halimio lasianthi-Ulicetum minoris* Capelo, J.C. Costa & M. Lousã 1994
- 49.1.11. *Halimio ocymoidis-Cistetum psilosepali* Br.-Bl., P. Silva & Rozeira 1965 nom. mut. [*Halimio ocymoidis-Cistetum hirsuti* Br.-Bl., P. Silva & Rozeira 1964]
- 49.1.12. *Halimio ocymoidis-Ericetum umbellatae* Rivas-Goday 1964
- 49.1.13. *Halimio umbellati-Ulicetum minoris* Antunes 1996
- 49.1.14. *Festuco-Corematetum albidii* M.A. Giménez & J.M. Losa in J.M. Losa 1975 [*Ulici latebracteati- Corematetum albi* J. & P. Guitián ex Izco & Amigo 2001]
- 49.1.15. *Lavandulo luisieri-Ulicetum jussiaei* J.C. Costa, Ladero, T.E. Díaz, M. Lousã, Espírito Santo, Vasconcelos, Monteiro & A. Amor 1993
- 49.1.16. *Polygalo microphyllae-Cistetum populifolii* Rivas Goday 1964
- 49.1.17. *Pterosparto lasianthi-Ericetum cinereae* Rothmaler 1954 corr. Rivas-Martínez, T.E. Díaz, Fernández González, Izco, Loidi, Lousã & Penas 2002
- 49.1.18. *Thymo villosi-Ulicetum airensis* J.C. Costa, Capelo, Espírito Santo & Lousã in J.C. Costa, Capelo, Neto, Espírito Santo & Lousã 1997
- 49.1.19. *Thymo villosi-Ulicetum latebracteati* (J.C. Costa, Capelo, Espírito Santo & Lousã 2002) J.C. Costa & Arsénio st. nov. hoc loco [basion. *Ulicetum latebracteato-minoris* (Br.-Bl., P. Silva & Rozeira 1965) Rivas-Martínez 1979 *thymetosum villosi* J.C. Costa, Capelo, Espírito Santo & Lousã in Silva Lusit. 10 (1): 123, 2002]
- 49.1.20. *Ulici eriocladi-Ericetum andevalensis* (A.V. Pérez, Nieto & Cabezudo 1993) Cabezudo & A.V. Pérez 1999
- 49.1.21. *Ulici eriocladi-Ericetum umbellatae* Rivas-Martínez 1979
- 49.1.22. *Ulici micranthi-Pterospartetum* (Rothmaler 1954) Tüxen & Oberdorfer 1958
- 49.2. *Dactylo maritimae-Ulicion maritimi* Géhu 1975**
- Communities which colonizes very exposed coastal cliffs submitted to strong sea winds with moderate saline spray. They are distributed throughout Cantabrian-Atlantic and Dividing Portuguese territories with a thermo-mesotemperate and mesomediterranean subhumid-humid bioclimate.
- Typus: Ulici maritime-Ericetum cinereae* Géhu & Géhu-Frank 1975.
- Characteristic species: *Anthyllis vulneraria* subsp. *iberica* (dif. al.), *Angelica pachycarpa* (dif. al.), *Dactylis marina* (dif. al.), *Daphne gnidium* var. *maritima*, *Ulex europaeus* subsp. *latebracteatus* f. *humilis*, *Ulex jussiaei* subsp. *congestus*.
- 49.2.1. *Cisto salviifolii-Ulicetum humilis* Br.-Bl., P. Silva & Rozeira 1965
- 49.2.2. *Daphno maritimi-Ulicetum congesti* Rivas-Martínez, T.E. Díaz & J.C. Costa ex J.C. Costa, Espírito Santo, Capelo & Lousã in J.C. Costa, Lousã, Capelo, Espírito Santo, Izco & Arsénio 2000
- 49.3. *Daboecion cantabricae*** (P. Dupont ex Rivas-Martínez 1979) Rivas-Martínez, Fernández-González & Loidi 1999
- Atlantic communities forming ferric-humic podzols, in thermo to lower orotemperate humid to ultrahyperhumid hyperoceanic to euoceanic bioclimate, in Cantabrian-Atlantic, Orocantabrian and South of Great Britain territories.
- Typus: Daboecio cantabricae-Ulicetum europaei* Br.-Bl. 1967.
- Characteristic species: *Carex asturica*, *Centaureum portensis*, *Cirsium filipendulum*, *Daboecia cantabrica*, *Erica ciliaris*, *Laserpitium prutenicum* subsp. *doufourianum*, *Pseudarrhenatherum longifolium*, *Pterospartum cantabricum*.
- 49.3.1. *Carici asturicae-Ericetum aragonensis* Honrado, Aguiar, Pulgar & Ortiz in Honrado, P. Alves, Nepomuceno & B. Caldas in Quercea 5: 33-34, 2004
- 49.3.2. *Cirsio filipenduli-Ericetum ciliaris* Br.-Bl., P. Silva & Rozeira 1965 ampl. Rivas-Martínez 1979
- 49.3.3. *Ulicetum latebracteato-minoris* (Br.-Bl., P. Silva & Rozeira 1965) Rivas-Martínez 1979
- 49.3.4. *Ulici minoris-Ericetum aragonensis* (Br.-Bl., P. Silva & Rozeira 1965) Rivas-Martínez in Itinera Geobot. 18(1): 310, 2011 [*Pterosparto tridentati-Ericetum australis* Br.-Bl., P. Silva & Rozeira 1964]

49.3.5. *Ulici minoris-Ericetum umbellatae* (Br.-Bl., P. Silva & Rozeira 1965) Rivas-Martínez 1979

[*Halimio alyssoidis-Pterospartetum cantabrigi* (Br.-Bl., P. Silva & Rozeira 1965) F. Prieto in T.E. Díaz 1990 corr. Honrado in J.C. Costa, Honrado, Monteiro-Henriques & Aguiar in Silva Lusit. 16(1): 123, 2008, *Halimio alyssoidis-Pterospartetum tridentatae* (Br.-Bl., P. Silva & Rozeira 1965) F. Prieto in T.E. Díaz 1990, *Halimio alyssoidis-Pterospartetum cantabrigi* (Br.-Bl., P. Silva & Rozeira 1965) F. Prieto in T.E. Díaz 1990 corr. Honrado 2001 nom. inval. (art.1), *Ulici minoris-Ericetum umbellatae pterospartetosum tridentatae* Br.-Bl., P. Silva & Rozeira 1965 em. Rivas-Martínez 1979 p.p.]

49.4. *Stauracanthion boivinii* (Rivas-Martínez 1979) Rivas-Martínez, Fernández-González & Loidi 1999

Stauracanthus boivinii communities on "orstein" with seasonal water resurgences, in thermo to mesomediterranean, dry to hyperhumid bioclimate, with Gaditan-Algarvian, Aljibic and Tingitanan distribution.

Typus: Genisto tridentis-Stauracanthetum boivinii Rivas-Martínez 1979.

Characteristic species: *Avenula sulcata* subsp. *albinnervis*, *Cistus palhinhae*, *Drosophyllum lusitanicum*, *Halimium lasianthum*, *Pedicularis sylvatica* subsp. *lusitanica*, *Stauracanthus boivinii*, *Stauracanthus spectabilis* subsp. *vicentinus*, *Thymus lotoccephalus* (dif. al.), *Tuberaria major*.

49.4.1. *Genisto triacanthi-Cistetum palhinhae* Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990 (fig. 42, page 111)

49.1.2. *Genisto triacanthi-Stauracanthetum vicentini* Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990 (fig. 43, page 112)

49.4.3. *Quercus lusitanicae-Stauracanthetum boivinii* Rothmaler 1954 corr. Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990

49.4.4. *Tuberario majoris-Stauracanthetum boivinii* Br.-Bl., P. Silva & Rozeira in Rivas-Martínez 1979
[*Nepetum boivinii* sensu Br.-Bl., P. Silva & Rozeira 1964]

49.5. *Daboecion azoricae* Lüpnicz 1975

Azorean pioneer communities of leptosols, hyperoceanic thermo to supratemperate.

Typus: Daboecietum azoricae Lüpnicz 1975 (49.5.1.).

Characteristic species: *Daboecia azorica*, *Diphastrium maderense*, *Huperzia dentata*, *Huperzia suberecta*, *Palhinhaea cernua*.

49.5.1. *Daboecietum azoricae* Lüpnicz 1975

49.5.2. *Huperzio dentatae-Callunetum vulgaris* F. Prieto, Dias & Aguiar in F. Prieto, Aguiar & Dias in Int. J. Geobot. Res. 2: 115. 2012

48.6. *Genistion micrantho-anglicae* Rivas-Martínez 1979

Heathlands where the soil has gleyic or stagnic properties, in bioclimate thermo to supramediterranean and thermo to lower orotemperate, and with Coastal Lusitanian-Andalusian, Tingitanan, Mediterranean

Central, West Iberian and Cantabrian-Atlantic distribution.

Typus: Thymelaeo dendrobryi-Genistetum carpetanae Rivas-Martínez 1979.

Characteristic species: *Cheirolophus uliginosus*, *Cirsium welwitschii*, *Erica lusitanica*, *Euphorbia uliginosa*, *Genista ancistrocarpa*, *Genista anglica*, *Genista berberidea*, *Genista micrantha*, *Leuzea longifolia*, *Potentilla erecta* var. *herminii*, *Thymelaea coridifolia* subsp. *dendrobryum*, *Ulex minor* var. *lusitanicus*.

49.6.1. *Agrostio hespericae-Ulicetum minoris* J. Honrado & Ortiz in Honrado, P. Alves, Nepomuceno & B. Caldas in Quercetea 5: 33, 2004

49.6.2. *Cirsio welwitschii-Ericetum ciliaris* Neto, Capelo, J.C. Costa & Espírito Santo in Neto, Capelo, J.C. Costa & Lousã 1996

49.6.3. *Cisto psilosepali-Ericetum lusitanici* Ladero ex Rivas-Martínez 1979

49.6.4. *Drosero intermediae-Ericetum ciliaris* Antunes 1994

49.6.5. *Erico ciliaris-Ulicetum lusitanicae* Rivas-Martínez & Costa in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980

49.6.6. *Genisto anglicae-Ericetum tetralicis* Rivas-Martínez 1979 (fig. 44, page 112)

49.6.7. *Genisto berberideae-Ericetum tetralicis* Bellot & Casaseca in Casaseca 1959

49.6.8. *Gentiano pneumonanthes-Genistetum ancistrocarpae* Honrado & P. Alves in Honrado, P. Alves, Nepomuceno & B. Caldas in Silva Lusit. 10(2): 252, 2002

49.6.9. *Lavandulo viridis-Ericetum lusitanici* Vila-Viçosa, Quinto-Canas, Mendes, Cano-Ortiz, Rosa-Pinto, Pinto-Gomes in Acta Bot. Gallica 159(2): 278, 2012

48.6.10. *Potentillo herminii-Callunetum* Rivas-Martínez 1981

50. *CISTO-LAVANDULETEA* Br.-Bl. in Br.-Bl., Molinier & Wagner 1940

Secondary Mediterranean scrub communities with xerophytic plants, especially of the genus *Cistus*, *Lavandula* and *Halimium*, on predominantly siliceous substrates and eroded or immature acidic soils. Distributed through the Western Mediterranean and North Africa in thermo to supramediterranean semiarid to subhumid bioclimate. They constitute advanced stages of degradation of the meso-oligotrophic forests undemanding in precipitation.

Typus: Lavanduletalia stoechadis Br.-Bl. 1940 em. Rivas-Martínez 1968 (50a.).

Characteristic species: *Cistus salviifolius*, *Cytinus hypocistis* subsp. *macranthus*, *Halimium viscosum*, *Orchis mascula* subsp. *olbiensis*, *Orchis morio* subsp. *champaneuxii*, *Orchis morio* subsp. *picta*.

50a. *LAVANDULETALIA STOECHADIS* Br.-Bl. 1940 em. Rivas-Martínez 1968

Scrub communities on siliceous cohesive soils, with a loamy, sandy or coarse texture, Western Mediterranean distribution.

Typus: Cistion laurifolii Rivas Goday in Rivas Goday, Borja, Monasterio, Galiano & Rivas-Martínez 1960 (50.1.).

Characteristic species: *Cistus crispus*, *Cistus ladanifer*, *Cistus monspeliensis*, *Cistus populifolius*, *Cytinus hypocistis* subsp. *hypocistis*, *Narcissus triandrus* subsp. *pallidulus*.

50.1. *Cistion laurifolii* Rivas Goday in Rivas Goday, Borja, Monasterio, Galiano & Rivas-Martínez 1960

Mesomediterranean to supramediterranean dry sub-humid sub-continental communities, in Mediterranean West Iberian and Central-Iberian territories.

Typus: Santolino rosmarinifoliae-Cistetum laurifolii Rivas Goday in Rivas Goday, Borja, Monasterio, Galiano & Rivas-Martínez 1960.

Characteristic species: *Aster aragonensis*, *Cistus laurifolius*, *Lavandula pedunculata*, *Lotus corniculatus* subsp. *carpetanus*.

50.1.1. *Lavandulo pedunculatae-Genistetum hystericis* Rivas-Martínez 1968

[*Quercu-Cistetum laurifolii* P. Silva 1970]

50.2. *Ulici argentei-Cistion ladaniferi* Br.-Bl., P. Silva & Rozeira 1964

Thermo to mesomediterranean dry to sub-humid hyperoceanic to euoceanic associations, in Mediterranean West Iberian and Coastal Lusitanian-Andalusian areas.

Typus: Cisto ladaniferi-Ulicetum argentei Br.-Bl., P. Silva & Rozeira 1964 (50.2.2.).

Characteristic species: *Astragalus lusitanicus*, *Genista hirsuta* subsp. *hirsuta*, *Lavandula luisieri*, *Lavandula sampaioana* subsp. *sampaioana*, *Lithodora lusitanica*, *Ulex argenteus*, *Ulex eriocladius*.

50.2a. *Ulici argentei-Cistenion ladaniferi*

Communities on eroded acid soils.

Typus: Cisto ladaniferi-Ulicetum argentei Br.-Bl., P. Silva & Rozeira 1964 (50.2.2.).

50.2.1. *Cisto ladaniferi-Genistetum hystericis* P. Silva ex P. Silva 1970

50.2.2. *Cisto ladaniferi-Ulicetum argentei* Br.-Bl., P. Silva & Rozeira 1964 (fig. 45, page 112)

50.2.3. *Euphorbio oxyphyllae-Cistetum ladanifer* Aguiar, J.C. Costa & Penas in Aguiar, J.C. Costa, Capelo, Amado, Honrado, Espírito Santo & Lousã in Silva Lusit. 11 (1): 103, 2003

50.2.4. *Genisto hirsutae-Cistetum ladaniferi* Rivas Goday 1955

50.2.5. *Lavandulo sampaioanae-Cistetum populifolii* T.E. Díaz, Penas, Lopez-Pacheco, Perez-Morales & F. Llamas 1989

50.2.6. *Lavandulo sampaioanae-Stauracanthetum lusitanicae* Castro Antunes & J.C. Costa in Acta Bot. Malacitana 36: 202-203, 2011

50.2.7. *Ulici eriocladi-Cistetum ladaniferi* Rivas-Martínez 1979

50.2b. *Lavandulo luisieri-Cistenion albidii* J.C. Costa, Pinto-Gomes, Lopes, Neto, Monteiro-Henriques, V. Silva, Arsénio, Lousã & Rivas Martínez ined

Chamaephytic and nanophanerophytic communities on eroded and decarbonated limestone derived soils (chromic luvisols and cambisols), in thermo-mesomediterranean dry to lower hyperhumid, in Coastal Lusitanian-Andalusian and Lusitanian-Extremadurean territories.

Typus: Ulici airensis-Ericetum scopariae Espírito Santo, Capelo, Lousã & J.C. Costa in Espírito Santo, Lousã, J.C. Costa & Capelo 2000 (50.2.13.).

Characteristic species: *Cistus albidus* (dif. subal.), *Cistus pulverulentus* (*C. crispus* x *C. albidus*), *Erica scoparia* (dif. subal.), *Rosmarinus officinalis* (dif. subal.), *Thymus camphoratus* subsp. *congestus*, *Ulex airensis*.

50.2.8. *Anthyllido maurae-Ulicetum jussiaei* C. Lopes, J.C. Costa, Pinto-Gomes, Lousã & Ladero ined

50.2.9. *Lavandulo sampaioanae-Cistetum albidii* M.T. Santos in Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990

50.1.10. *Phlomido purpureae-Cistetum albidii* Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990 (fig. 46, page 112)

50.2.11. *Sedo albi-Cistetum crispis* J.C. Costa, Neto, Pinto-Gomes, Lopes, Monteiro-Henriques, Arsénio, V. Silva, Lousã & Rivas-Martínez ined

50.2.12. *Thymetum congesti* J.C. Costa, P. Arsénio, C. Neto, Loidi & Pinto-Gomes ined.

50.2.13. *Ulici airensis-Ericetum scopariae* Espírito Santo, Capelo, Lousã & J.C. Costa in Espírito Santo, Lousã, J.C. Costa & Capelo 2000

50b. *STAUACANTHO GENISTOIDIS-HALIMETALIA COMMUTATI* Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990

Thermo to mesomediterranean dry to subhumid hyperoceanic communities, rich in endemic species, characteristic of paleodunes and sandy soils, in Coastal Lusitanian-Andalusian and Moroccan Atlantic areas.

Typus: Stauracantho genistoidis-Halimion halimifolii Rivas-Martínez 1979.

50.3. *Coremation albi* Rothmaler 1943

[*Stauracantho genistoidis-Halimion halimifolii* Rivas-Martínez 1979]

Single alliance in the Iberian Peninsula.

Typus: Cistetum libanotidis Rothmaler 1954 (50.3.2.).

Characteristic species: *Armeria macrophylla*, *Armeria pinifolia*, *Armeria rouyana*, *Armeria velutina*, *Cistus libanotis*, *Dianthus broteri* subsp. *hinoxianus*, *Fritillaria lusitanica* subsp. *stenophylla*, *Halimium calycinum*, *Halimium halimifolium* subsp. *halimifolium*, *Halimium halimifolium* subsp. *multiflorum*, *Halimium verticillatum*, *Iberis welwitschii*, *Lavandula sampaioana* subsp. *lusitanica*, *Stauracanthus genistoides*, *Stauracanthus spectabilis* subsp. *spectabilis*, *Thymus albicans* subsp. *albicans*, *Thymus albicans* subsp. *donyanae*, *Thymus camphoratus* subsp. *camphoratus*, *Thymus capitellatus*, *Ulex australis* subsp. *australis*, *Ulex australis* subsp. *Welwitschianus*, *Ulex subsericeus*.

- 50.3.1. *Celtico giganteae-Stauracanthetum vicentini* (Rothmaler 1954) Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa ex J.C. Costa, Espírito Santo & Lousã 1994 nom. mut. hoc loco (fig. 47, page 112)
[*Stipo giganteae-Stauracanthetum vicentini* (Rothmaler 1954) Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa ex J.C. Costa, Espírito Santo & Lousã 1994; *Coremetum vicentini* Rothmaler 1954 nom. illeg. p.p.]
- 50.3.2. *Cistetum libanotidis* Rothmaler 1954 nom. mut.
[*Cistetum bourgaeani* Rothmaler 1954, *Cistetum bourgaeani* Rothmaler 1954 em. Br.-Bl., P. Silva & Rozeira 1964, *Ulici subsericeae-Cistetum bourgaeani* (Br.-Bl., P. Silva & Rozeira 1964) Rivas-Martínez 1979]
- 50.3.3. *Halimio halimifolii-Stauracanthetum genistoidis* Rivas-Martínez, Costa, Castroviejo & Valdés 1980
- 50.3.4. *Halimio verticillati-Stauracanthetum genistoidis* Pinto-Gomes, S. Mendes, Vásquez, Cano & Torres in *Quercetea* 4: 72, 2004
- 50.3.5. *Stauracantho genistoidis-Corematetum albi* Br.-Bl., P. Silva & Rozeira 1964
- 50.3.6. *Thymo camphorati-Stauracanthetum spectabilis* (Rothmaler 1954) Rivas-Martínez, T.E. Díaz & Fernández-González 1990 (fig. 48, page 112)
[*Coremetum vicentini* Rothmaler 1954 nom. illeg. p.p.]
- 50.3.7. *Thymo capitellati-Stauracanthetum genistoidis* (Rothmaler 1954) Rivas-Martínez, T.E. Díaz & Fernández-González 1990 (fig. 49, page 113)
[*Coremetum taganum* Rothmaler 1954 nom. illeg. p.p.]

51. ROSMARINETEA OFFICINALIS Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas 2002

Communities dominated by chamaephytes and nanophanerophytes, rich in species, that grow on alkaline, incipient or very eroded soils (limestones, dolomites, gypsum), often rocky. They result from the effect of fire and farming on scrublands and other potential natural vegetation. Mediterranean distribution, in infra to oromediterranean arid to humid bioclimate.

Typus: *Rosmarinetalia officinalis* Br.-Bl. ex Molinier 1934 (51a.).

Characteristic species: *Acinos alpinus* subsp. *meridionalis*, *Anthyllis vulneraria* subsp. *maura*, *Aphyllanthes monspeliensis*, *Argyrolobium zanonii*, *Cistus albidus*, *Coronilla minima* subsp. *minima*, *Dorycnium pentaphyllum* subsp. *pentaphyllum*, *Elaeoselinum tenuifolium*, *Fumana ericifolia*, *Fumana procumbens* subsp. *procumbens*, *Fumana thymifolia*, *Globularia alypum*, *Helianthemum violaceum*, *Koeleria vallesiana*, *Rosmarinus officinalis*, *Stachelina dubia*, *Thesium divaricatum*, *Thymelaea ruizii*, *Valeriana tuberosa*.

51a. ROSMARINETALIA OFFICINALIS Br.-Bl. ex Molinier 1934

Communities of incipient or eroded soils, derived from limestone or marl rich in calcium carbonate. They represent highly degraded stages of the climax forests

from *Quercetea ilicis*, in infra to supramediterranean semiarid to humid, Western Mediterranean and North African territories.

Typus: *Rosmarinion officinalis* Br.-Bl. ex Molinier 1934 (syn. *Rosmarino officinalis-Ericion multiflorae* Br.-Bl. in Br.-Bl., Font Quer, G. Braun-Blanquet, Frey, Jansen & Moor 1935).

Characteristic species: *Aristolochia pistolochia*, *Astragalus glaux*, *Catananche caerulea*, *Cytinus ruber*, *Euphorbia nicaeensis* var. *niccaensis*, *Fumana laevipes*, *Globularia vulgaris*, *Helianthemum apenninum* subsp. *apenninum*, *Helianthemum cinereum* subsp. *rotundifolium*, *Helianthemum croceum* subsp. *stoechadifolium*, *Helianthemum marifolium*, *Lavandula latifolia*, *Leuzea conifera*, *Ononis pusilla*, *Orobanche latisquama*, *Rosmarinus palaui*, *Ruta chalepensis*, *Scorzonera hispanica* subsp. *crispatula*, *Serratula flavescens* subsp. *leucantha*, *Serratula pinnatifida*, *Teucrium capitatum*, *Teucrium haenseleri*, *Viola arborescens*.

51.1. Saturejo micranthae-Thymbrion capitatae Rivas Goday & Rivas-Martínez 1969 nom. mut. et conserv.

[*Micromerio-Coridothymion* Rivas Goday & Rivas-Martínez 1969 (art.3f), *Saturejo-Coridothymion capitatae* Rivas Goday & Rivas-Martínez 1969, *Eryngio-Ulicion erinacei* Rothmaler 1943]

Thermo-mesomediterranean dry-subhumid communities on eroded calcareous soils or leptosols, Southern Baetic, Hispalensean, Algarvian and Aracean-Pancean.

Typus: *Teucrio lusitanici-Thymbretum capitatae* Rivas Goday & Rivas-Martínez 1969.

Characteristic species: *Asperula hirsuta*, *Genista hirsuta* subsp. *algarbiensis*, *Helianthemum hirtum* subsp. *bethuricum*, *Helianthemum origanifolium*, *Satureja graeca* subsp. *micrantha*, *Serratula baetica* subsp. *lusitanica*, *Sideritis algarviensis* subsp. *lusitanica*, *Teucrium algarbiensis*, *Teucrium lusitanicum*, *Thymbra capitata*, *Thymus lotocephalus*.

51.1a. Eryngio-Ulicenion erinacei (Rothmaler 1943) Rivas-Martínez in Rivas-Martínez, T.E. Díaz, Fernández-González, Izco, Loidi, Lousã & Penas 2002

Hyperoceanic communities, Vincentian Promontory.

Typus: *Ulicetum erinacei* Rothmaler 1943 (51.1.1.).

Characteristic species: *Biscutella vinctina*, *Hyacinthoides vinctina* subsp. *vinctina*, *Sideritis algarviensis* subsp. *algarviensis*, *Teucrium vinctinum*, *Ulex erinaceus*.

51.1.1. *Ulicetum erinacei* Rothmaler 1943 (fig. 50, page 113)

51.1b. Saturejo micranthae-Thymbrenion capitatae (Rivas Goday & Rivas-Martínez 1969) Rivas-Martínez, Fernández González & Loidi 1999 nom. mut.

[*Saturejo-Coridothymenion* (Rivas Goday & Rivas-Martínez 1969) Rivas-Martínez, Fernández-González & Loidi 1999]

Southern Baetic, Hispalensean, Algarvian and Aracean-Pancean communities.

Typus: *Teucrio lusitanici-Thymbretum capitatae* Rivas Goday & Rivas-Martínez 1969.

51.1.2. *Siderito lusitanicae-Genistetum algarbiensis* Pinto-Gomes & P. Ferreira in Flora e Vegetação do Barrocal Algarvio. Tavira-Portimão: 242, 2005)

51.1.3. *Thymo lotocephali-Coridothymetum capitati* Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990

51.2. *Ulici densi-Thymion sylvestris* (Capelo, J.C. Costa, Espírito Santo & Lousã 1993) J.C. Costa, Capelo, Lousã, Neto & Rivas-Martínez in Silva Lusit. 17(2) 247, 2009

[*Serratulo estremadurensis-Thymenion sylvestris* Capelo, J.C. Costa, Espírito Santo & Lousã 1993; *Klaseo lusitanicae-Thymion sylvestris* (Capelo, J.C. Costa, Espírito Santo & Lousã 1993) Rivas-Martínez, Capelo, J.C. Costa, Lousã & Espírito Santo 2011 (art. 22)]

Chamaephytic communities on eroded soils, derived from Jurassic and Cretaceous limestones and dolomitic marly (luvisols chromic), thermo-mesomediterranean, subhumid-humid, Sadensean-Divinding Portuguese territories.

Typus: Salvia sclareoidis-Ulicetum densi Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990 ex Capelo, J.C. Costa, Lousã & Neto 1992 (51.2.1).

Characteristic species: *Bartsia aspera*, *Iberis microcarpa*, *Serratula estremadurensis*, *Sideritis hirsuta* subsp. *hirtula*, *Thymus sylvestris*, *Ulex densus*.

51.2.1. *Salvia sclareoidis-Ulicetum densi* Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990 ex Capelo, J.C. Costa, Lousã & Neto 1992

51.2.2. *Teucrio capitati-Thymetum sylvestris* Espírito Santo & Capelo in Capelo, J.C. Costa, Espírito Santo & Lousã 1993

51.2.3. *Thymo sylvestris-Ulicetum densi* (Capelo, J.C. Costa, Lousã & Neto 1993) J.C. Costa, Capelo, Lousã, Neto & Rivas-Martínez in Silva Lusit. 17(2) 247, 2009 (fig. 51, page 113) [*Salvia sclareoidis-Ulicetum densi* Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990 ex Capelo, J.C. Costa, Lousã & Neto 1992 *thymetosum sylvestris* Capelo, J.C. Costa, Lousã & Neto 1992; *Thymo sylvestris-Ulicetum densi* Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990 nom. inval. (art. 3b)]

51.3. *Sideritido incanae-Salvion lavandulifoliae* (Rivas Goday & Rivas-Martínez 1969) Izco & A. Molina 1989

Calcicolous communities, meso to supramediterranean, mostly subcontinental, in the centre of the Iberian Peninsula.

Typus: Lino differentis-Salvietum lavandulifoliae Rivas Goday & Rivas-Martínez 1969.

Characteristic species: *Sideritis bubanii*.

51.3a. *Xero-Aphyllanthenion* Rivas Goday & Rivas-Martínez 1969 em. Izco & A. Molina 1989

Calcicolous associations, meso to supramediterranean dry subhumid, Castilian reaching the Lusitanian-Duriensean territories.

Typus: Lino differentis-Salvietum lavandulifoliae Rivas Goday & Rivas-Martínez 1969.

Characteristic species: *Silene boryi* subsp. *duriensis*.

51.3.1. *Sileno duriensis-Aphyllanthenion monspeliensis* Amado, Honrado & Aguiar in Aguiar, J.C. Costa, Capelo, Amado, Honrado, Espírito Santo & Lousã in Silva Lusit. 11 (1): 108, 2003

VIIIB. SERAL AND MANTLE SHRUBLANDS

52. *CYTISETEA SCOPARIO-STRIATI* Rivas-Martínez 1974

Shrubby communities dominated by *Leguminosae* of the tribe *Genisteeae* (brooms). Usually the mantle or the replacement stage of meso-oligotrophic forests that grow in deep siliceous soils with type “mull” humus and without temporary hydromorphy. Sometimes represent edaphoxerophilous permanent communities. their ecological optimum is in Iberian Peninsula, they can reach the Atlantic Europe, the Tyrrhenian and the Maghrebi territories, in infra to oromediterranean semiarid to humid and thermo to lower orotemperate dry to hyperhumid bioclimate.

Typus: Cytisetalia scopario-striati Rivas-Martínez 1974 (52a.).

Characteristic species: *Adenocarpus complicatus*, *Adenocarpus telonensis*, *Cytisus baeticus*, *Pteridium aquilinum* var. *aquilinum*, *Retama sphaerocarpa*.

52a. *CYTISETALIA SCOPARIO-STRIATI* Rivas-Martínez 1974

Seral large-sized plant communities, thermo to lower orotemperate subhumid to hyperhumid and thermo to supramediterranean dry to hyperhumid, with Mediterranean West Iberian, Coastal Lusitanian-Andalusian, Atlantic European and Cévennean distribution.

Typus: Genistion floridae Rivas-Martínez 1974 (52.1.).

Characteristic species: *Adenocarpus lainzii*, *Cytisus grandiflorus* subsp. *grandiflorus*, *Cytisus multiflorus*, *Cytisus oromediterraneus*, *Cytisus scoparius* subsp. *scoparius*, *Genista hystrix*, *Orobanche rapum-genistae*.

52.1. *Genistion floridae* Rivas-Martínez 1974

Siliceous shrub communities, upper mesomediterranean to supramediterranean and supratemperate sub-mediterranean, which constitute the forest mantle or the first replacement step of *Quercenion pyrenaicae*, *Ilici-Fagion* and *Paeonio broteri-Quercenion rotundifoliae* in central and western Iberian Peninsula.

Typus: Genistetum polygaliphyllae-Adenocarpetum hispanicae Rivas-Martínez 1974.

Characteristic species: *Adenocarpus argyrophyllus*, *Adenocarpus hispanicus* subsp. *gredensis*, *Cytisus striatus* subsp. *eriocarpus*, *Genista cinerascens*, *Genista florida* subsp. *florida*.

52.1.1. *Cytisetum multifloro-eriocarpi* Rivas Goday 1964 nom. mut..

[*Cytiso multiflori-Sarothamnetum eriocarpi* Rivas Goday 1964]

52.1.2. *Cytiso oromediterranei-Genistetum cinerascens* Rivas-Martínez 1970 corr. Rivas-Martínez & Cantó 1987

52.2. *Retamion sphaerocarphae* Rivas-Martínez 1981

Siliceous communities, thermo to lower supramediterranean upper semiarid to lower subhumid, in Lusitanian-Extremadurean and Salmanticensian areas. They form the forest mantles or replacement stages *Paeonio broteri-Quercion rotundifoliae*.

Typus: Lavandulo-Adenocarpetum aurei Rivas-Martínez 1968.

Characteristic species: *Adenocarpus aureus* subsp. *aureus*, *Cytisus scoparius* subsp. *bourgaei*, *Genista polyanthos*.

52.2.1. *Cytiso multiflori-Retametum sphaerocarphae* Rivas-Martínez ex F. Navarro, Sánchez-Anta, González-Zapatero, Gallego, Elena & C. Valle 1987

52.2.2. *Genistetum polyanthi* Rivas-Martínez & Belmonte ex Capelo, Lousã & J.C. Costa 1996 (fig. 52, page 113)

52.2.3. *Retamo sphaerocarphae-Cytisetum bourgaei* Rivas-Martínez & Belmonte ex Capelo 1996

52.3. *Cytision multiflori* Rivas-Martínez 1974

[*Genision polygaliphyllae* Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas 1984]

Siliceous shrub communities, supra-orotemperate supramediterranean, subhumid to hyperhumid, with Orocantabrian, Juresian, Ourensan-Sanabriensean, Leone-se, and Salmantine Estrelensean distribution. Permanent communities, forest mantles or replacement stages of *Quercion pyrenaicae* and *Betulion fontquerii-celtibericae*.

Typus: Echinopartetum iberici Rivas-Martínez 1974 corr. Rivas-Martínez & Sánchez-Mata 2002 (52.3.2).

Characteristic species: *Genista florida* subsp. *polygaliphylla*.

52.3a. *Cytisenion multiflori* Rivas-Martínez ex Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas 1984

Supramediterranean and supratemperate subhumid to hyperhumid communities, in Western Carpetan, Salmanticensean, Bercian-Sanabriensean and Estrelensean territories.

Typus: Echinopartetum iberici Rivas-Martínez 1974 corr. Rivas-Martínez & Sánchez-Mata 2002 (52.3.2.).

Characteristic species: *Echinopartum ibericum* subsp. *ibericum*, *Teucrium salviastrum*.

52.3.1. *Cytiso striati-Genistetum polygaliphyllae* Rivas-Martínez 1974

52.3.2. *Echinopartetum iberici* Rivas-Martínez 1974 corr. Rivas-Martínez & Sánchez-Mata 2002 (fig. 53, page 113)

52.3.3. *Genisto hystricis-Cytisetum multiflori* Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas 1984

52.3.4. *Genisto hystricis-Echinopartetum iberici* F. Navarro & C. Valle 1983 corr. Rivas-Martínez 2011

52.3b. *Genistenion polygaliphyllae* Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas 1984

Supra to lower orotemperate subhumid to hyperhumid communities, with Orocantabrian, Orobercian, Juresian, Leone-se and Cantabrian-Basque distribution.

Typus: Cytiso cantabricae-Genistetum obtusirameae Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas 1984.

52.3.5. *Cytiso scopario-Genistetum polygaliphyllae* Rivas-Martínez, T.E. Díaz, Prieto, Loidi & Penas 1984

52.3.6. *Genisto falcatae-Ericetum arboreae* Ortiz, Amigo & Izco 1991

52.4. *Ulici europaei-Cytision striati* Rivas-Martínez, Bascónes, Díaz, Fernández-González & Loidi 1991

Siliceous communities formed by large-sized plants, forming forest mantles or seral stages of *Quercion pyrenaicae* and *Quercion broteri*, thermo-mesotemperate submediterranean and mesomediterranean subhumid to hyperhumid with oceanic trend, in Cantabrian-Atlantic, Mediterranean West Iberian and Coastal Lusitanian-Andalusian territories.

Typus: Ulici europaei-Cytisetum ingramii Rivas-Martínez 1878.

Characteristic species: *Adenocarpus anisochilus*, *Cytisus striatus* subsp. *striatus*, *Cytisus scoparius* var. *oxyphyllus*, *Ulex europaeus* subsp. *europaeus*, *Ulex europaeus* subsp. *latebracteatus*.

52.4.1. *Adenocarpus anisochili-Cytisetum scoparii* J.C. Costa, Capelo & Lousã in J.C. Costa, Capelo, Lousã, Antunes, Aguiar, Izco & Ladero 2000 corr. Pinto-Gomes, Cano-Ortiz, Quinto-Canas, Vila-Viçosa & Martínez-Lombardo Acta Bot. Gallica 159 (2): 260, 2012

[*Adenocarpus anisochili-Cytisetum striati* J.C. Costa, Capelo & Lousã in J.C. Costa, Capelo, Lousã, Antunes, Aguiar, Izco & Ladero 2000]

52.4.2. *Adenocarpus anisochili-Ulicetum latebracteati* (J.C. Costa, Capelo & Lousã in J.C. Costa, Capelo, Lousã, Antunes, Aguiar, Izco & Ladero 2000) J.C. Costa, Neto & T. Vasconcelos st. nov. hoc loco

[basion.: *Adenocarpus anisochili-Cytisetum striati* J.C. Costa, Capelo & Lousã in J.C. Costa, Capelo, Lousã, Antunes, Aguiar, Izco & Ladero 2000 *ulicetosum latebracteati* J.C. Costa, Capelo & Lousã 2000] [*Ulici latebracteati-Cytisetum striati* sensu Pinto-Gomes, Cano-Ortiz, Quinto-Canas, Vila-Viçosa & Martínez-Lombardo 2012 (nom inval., art. 3b) non Rivas-Martínez ex J.C. Costa, Izco, Lousã, Aguiar & Capelo in J.C. Costa, Capelo, Lousã, Antunes, Aguiar, Izco & Ladero 2000]

52.4.3. *Erico scopariae-Cytisetum grandiflori* J.C. Costa, Lousã, Ladero & Capelo in Costa, Capelo, Lousã, Antunes, Aguiar, Izco & Ladero 2000

52.4.4. *Genisto falcatae-Adenocarpetum lainzii* Antunes, Capelo, J.C. Costa & Lousã in J.C. Costa, Capelo, Lousã, Antunes, Aguiar, Izco & Ladero 2000 corr. Antunes, Capelo, Pinto-Gomes & J.C. Costa corr. hoc loco
[*Genisto falcatae-Adenocarpetum anisochili* Castro Antunes, Capelo, J.C. Costa & Lousã in Costa, Capelo, Lousã, Antunes, Aguiar, Izco & Ladero 2000]

52.4.5. *Lavandulo sampaioanae-Cytisetum multiflori* Br.-Bl., P. Silva & Rozeira 1964 (fig.54, page 114)

52.4.6. *Lavandulo viridis-Cytisetum striati* Pinto-Gomes, Cano-Ortiz, Quinto-Canas, Vila-Viçosa & Martínez-Lombardo Acta Bot. Gallica 159 (2): 260, 2012

52.4.7. *Ulici latebracteati-Cytisetum striati* Rivas-Martínez ex J.C. Costa, Izco, Lousã, Aguiar & Capelo in J.C. Costa, Capelo, Lousã, Antunes, Aguiar, Izco & Ladero 2000

52.5. Retamion monospermae Rivas-Martínez & Cantó 2002

Permanent communities, forest mantles or seral stages of *Quercion broteroi* and *Juniperion turbinatae*, on paleodunes and sandy soils, thermomediterranean dry to subhumid, in Coastal Lusitanian-Andalusian and northern Maghreb areas.

Typus: Pycnocomono rutifolii-Retametum monospermae Pérez-Chicano 1983 (52.5.1.).

Characteristic species: *Cytisus grandiflorus* subsp. *cabezudoi*, *Retama monosperma*.

52.5.1. *Pycnocomono rutifolii-Retametum monospermae* Pérez-Chicano 1983
[*Centaureo sphaerocephalae-Retametum monospermae* auct. lus. non Tregublov 1963]

52.5.2. *Cytisetum cabezudoi* J.C. Costa, Lousã, Capelo & Ladero in J.C. Costa, Aguiar, Capelo, Lousã, Castro Antunes, Honrado, Izco & Ladero in Quercetia 4: 53, 2004

53. RHAMNO CATHARTICAE-PRUNETEA SPINOSAE Rivas Goday & Borja ex Tüxen 1962

Deciduous shrubby mesophytic and xerophytic communities that constitute the mantle and seral stages of the *Quercio-Fagetea* and *Salici-Populetea nigrae* forests. This vegetation class is dominated by nanophanerophytes and microphanerophytes, mainly thorny and spikey scrambling shrubs, which developed in rich nutrient humic soils at forest edges, towards field's grasslands, or in river-banks; also includes permanent communities of shallow stony soils in cliffs, gravel beds, steep slopes or mountain gullies and snow cones, in both Eurosiberian and Mediterranean Regions.

Typus: Prunetalia spinosae Tüxen 1952 (53a.).

Characteristic species: *Amelanchier ovalis*, *Clematis vitalba*, *Cornus sanguinea*, *Crataegus monogyna*, *Prunus insittitia*, *Prunus spinosa* subsp. *spinosa*, *Rosa canina*, *Rubus caesius*, *Sambucus nigra*, *Tamus communis*.

53a. PRUNETALIA SPINOSAE Tüxen 1952

Hardwood shrubs and related thorn and prickly scrub communities, that constitute the edges or seral mantle of deciduous forests. Infratemperate to lower orotemperate dry to hyperhumid and thermo to oromediterranean subhumid to humid in Eurosiberian and Mediterranean areas.

Typus: Rhamno alpini-Berberidion vulgaris Br.-Bl. ex Rivas-Martínez in Itinera Geobot. 18(1): 333, 2011 (*Berberidion vulgaris* Br.-Bl. 1950 (art.8)).

Characteristic species: *Euonymus europaeus*, *Ligustrum vulgare*, *Prunus mahaleb*, *Rhamnus catharticus*, *Rosa agrestis*, *Rosa corymbifera*, *Rosa nitidula*, *Rosa squa-*

rrosa, *Rosa stylosa*, *Rosa tomentosa*, *Rosa vosagiaca*, *Rosa villosa*, *Rubus canescens*, *Rubus lainzii*, *Rubus radula*, *Rubus vigoii*, *Viburnum lantana*, *Viburnum opulus*.

53.1. Pruno spinosae-Rubion ulmifolii O. Bolòs 1954

Thermomediterranean to lower supramediterranean and thermotemperate to lower supratermperate dry to humid communities, in Western Mediterranean and Southwestern Eurosiberian areas. They constitute the forest mantle, or the first replacement stage of the hygrophytes mesophytic deciduous or persistent forests, on oligo-mesotrophic slightly acidic to basic soils.

Typus: Coriarietum myrtifoliae O. Bolòs 1954.

Characteristic species: *Lonicera periclymenum* subsp. *hispanica*, *Rosa andegavensis*, *Rosa pouzinii*, *Rosa micrantha*, *Rubus ulmifolius*.

53.1a. Lonicero periclymeni-Rubion ulmifolii Géhu, De Foucaud & Delelis in Itinera Geobot. 18(1): 335, 2011

Cantabrian-Atlantic and Aquitanian-Armoricanean, thermo-mesotemperate subhumid to humid communities, seral of *Pulmonario longifoliae-Quercion roboris*.

Typus: Tamo communis-Rubetum ulmifolii Tüxen in Tüxen & Oberdorfer 1958 num. inv. (53.1.1.)

Characteristic species: *Rubus brigantinus*, *Rubus henriquesii* subsp. *henriquesii*.

53.1.1. *Tamo communis-Rubetum ulmifolii* Tüxen in Tüxen & Oberdorfer 1958 nom. inv.

53.1b. Rosenion carioti-pouzinii Arnáiz ex Loidi 1989

Communities of deep moistly soils, that fringe or replace the deciduous or marcescent forests, thermo to supramediterranean, euoceanic to continental, in Mediterranean West Iberian, Mediterranean Central Iberian and Coastal Lusitanian-Andalusian territories.

Typus: Rubo ulmifolii-Rosetum corymbiferae Rivas-Martínez & Arnáiz in Arnáiz 1979 (53.1.6.).

Characteristic species: *Prunus spinosa* subsp. *insittitoides*, *Rosa deseglisei*, *Rubus castellarnauai*, *Rubus henriquesii* subsp. *cintranus*.

53.1.2. *Clematido campaniflorae-Rubetum ulmifolii* Peinado & A. Velasco in Peinado, G. Moreno & A. Velasco 1983

53.1.3. *Lonicero hispanicae-Rubetum ulmifolii* Rivas-Martínez, Costa, Castroviejo & Valdés 1980

53.1.4. *Rubetum ulmifolio-vigoii* Vicente & Galán in Acta Bot. Malacitana 33: 191, 2008

53.1.5. *Rubo ulmifolii-Prunetum insittitoides* (Capelo, J.C. Costa & Lousã 1996) J.C. Costa, Capelo, Espírito Santo & Lousã in Silva Lusit. 10 (1): 122-123, 2002

53.1.6. *Rubo ulmifolii-Rosetum corymbiferae* Rivas-Martínez & Arnáiz in Arnáiz 1979

53.1.7. *Rubo vigoii-Sambucetum nigrae* V. Silva & Pinto-Cruz in V. Silva, Portela-Pereira, J.C. Costa, Arsénio, Monteiro-Henriques, Neto & Pinto-Cruz in Acta Bot. Malacitana 37: 2012

53.2. *Frangulo alni-Pyrion cordatae* M. Herrera, F. Prieto & Loidi 1991

Siliceous shrubs, thorny edges, or deciduous forests of *Quercenion robori-pyrenaica* and *Pulmonario longifoliae-Quercenion roboris*, on acid soils (cambisols and luvisols), thermo-mesotemperate, subhumid to hyperhumid oceanic, Cantabrian-Atlantic.

Typus: Frangulo alni-Pyretum cordatae Herrera, F. Prieto & Loidi 1991 (53.2.1.).

Characteristic species: *Pyrus cordata*, *Rubus sam-paioanus*.

53.2.1. *Frangulo alni-Pyretum cordatae* Herrera, F. Prieto & Loidi 1991

53b. *SALICETALIA ARENARIAE* Preising & Webber in Webber 1977

Communities of *Salix arenaria* in sandy Atlantic coasts (South Scandinavia to North France), with a relict disjunction in central and northern Portugal.

Typus: Salicion arenariae Tüxen ex Passarge in Scamoni 1963.

Characteristic species: *Salix repens* subsp. *arenaria*.

53.3. *Holoschoeno australis-Salicion arenariae* Neto, J.C. Costa, Capelo & Honrado in Silva Lusit. 12 (1): 130, 2004

Communities of *Salix arenaria* in sandy soils with temporary moisture, mesomediterranean subhumid barely hyperoceanic, in the Dividing Portuguese coast and in South Minho areas.

Typus: Holoschoeno australis-Salicetum arenariae M.J. Martins & Penas ex J.C. Costa, Neto, Capelo & Lousã in J.C. Costa, Capelo, Espírito Santo & Lousã in Silva Lusit. 10 (1): 123, 2002 (53.3.1.).

53.3.1. *Holoschoeno australis-Salicetum arenariae* M.J. Martins & Penas ex J.C. Costa, Neto, Capelo & Lousã in J.C. Costa, Capelo, Espírito Santo & Lousã in Silva Lusit. 10 (1): 123, 2002

[*Salicetum atrocinerneo-arenariae* M.J. Martins & Penas in Martins 1999 nom. inv. (art.1)]

XI. FOREST, WOODLANDS, SEMIDESERT AND DESERT POTENTIAL VEGETATION**XIA. MARSH, CHIONOPHILOUS, PIONEER AND CLIMATIC RIPARIAN SHRUBLANDS AND WOODLANDS****54. *ALNETEA GLUTINOSAE*** Br.-Bl. & Tüxen ex Westhoff, Dijk & Passchier 1946

Woodlands of alders and willows of swamps and fens. Inhabit river-swamp, peaty or muddy soils and mesotrophic to dystrophic lentic waters. They present subhyperoceanic, oceanic and subcontinental bioclimate, and Atlantic Central European and Coastal Lusitanian-Andalusian relict distribution.

Typus: Alnetalia glutinosae Tüxen 1937 (54a.).

Characteristic species: *Carex laevigata*, *Myrica gale*, *Scutellaria galericulata*, *Sphagnum denticulatum*, *Sphagnum squarrosum*, *Thelypteris palustris*.

54a. *ALNETALIA GLUTINOSAE* Tüxen 1937

Alder swamp woods, thermo to supratemperate and thermo to mesomediterranean, Atlantic Central European and relicts Coastal Lusitanian-Andalusian.

Typus: Alnion glutinosae Malcuit 1929 (54.1.)

54.1. *Alnion glutinosae* Malcuit 1929

Alliance formed by alder woods and *Salix atrocinernea* fluvial-marshes, dystrophic and lentic, thermo-supratemperate and thermo-mesomediterranean, in Atlantic Central European and Coastal Lusitanian-Andalusian relict distribution.

Typus (lectotypus art. 19): Alnetum glutinosae Malcuit 1929 non Issler 1926 (syn. *Carici elongatae-Alnetum glutinosae* Koch 1926).

54.1a. *Salici atrocinerreae-Alnion glutinosae* Rivas-Martínez, T.E. Díaz & F. Prieto in Itinera Geobot. 18(2): 466, 2011

Alder and *Salix atrocinernea* swamp woods, thermo-temperate and thermo-mesomediterranean hyperoceanic and semihyperoceanic, in Coastal Lusitanian-Andalusian, Cantabrian-Atlantic and Aquitanian territories.

Typus: Carici lusitanicae-Alnetum glutinosae T.E. Díaz & F. Prieto 1994 (54.1.1.).

Characteristic species: *Carex durieui*, *Peucedanum lancifolium*.

54.1.1. *Carici lusitanicae-Alnetum glutinosae* T.E. Díaz & F. Prieto 1994

54.1.2. *Carici lusitanicae-Salicetum atrocinerreae* Neto, Capelo, J.C. Costa & M. Lousã 1996

54.1.3. *Viti sylvestris-Salicetum atrocinerreae* Rivas-Martínez & Costa in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980 corr. Rivas-Martínez in Itinera Geobot. 18(1): 338, 2011 (fig. 55, page 114)

55. *NERIO-TAMARICETEA* Br.-Bl. & O. Bolòs 1958

Riparian vegetation, formed by microphanerophytes, nanophanerophytes and tall grasses. Colonizer of rivers and streams with temporary severe drought and salty lagoons margin, in infra to supramediterranean arid to dry bioclimate, in the Mediterranean, Shaaro-Northarabian and Iranic-Turaniaen Regions.

Typus: Tamaricetalia africanae Br.-Bl. & O. Bolòs 1958 em. Izco, Fernández-González & Molina 1984 (55a.)

Characteristic species: *Imperata cylindrica*, *Nerium oleander*, *Panicum repens*, *Polygonum equisetiforme*, *Tamarix canariensis*, *Tamarix africana* var. *africana*, *Tamarix mascatensis*.

55a. *TAMARICETALIA AFRICANAE* Br.-Bl. & O. Bolòs 1958 em. Izco, Fernández-González & Molina 1984

Single order in the Mediterranean Region.

Typus: Tamaricion africanae Br.-Bl. & O. Bolòs 1958 (55.1.).

55.1. *Tamaricion africanae* Br.-Bl. & O. Bolòs 1958

Freshwater or subhalophilic communities dominated by species of *Tamarix* ssp., submitted to severe drought and high water fluctuations, undergoing periods of high aridity and high temperatures, infra to supramediterranean in the Mediterranean Region.

Typus: Tamaricetum canariensis Br.-Bl. & O. Bolòs 1958 corr. O. Bolòs & Vigo 1984 (*Tamaricetum gallicae* Br.-Bl. & O. Bolòs 1958).

Characteristic species: *Tamarix africana* var. *fluminensis*, *Tamarix gallica*.

55.1.1. *Polygono equisetiformis-Tamaricetum africanae* Rivas-Martínez & Costa in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980 (fig. 56, page 114)

55.2. *Rubi ulmifolii-Nerion oleandri* O. Bolòs 1985

Nerium oleander communities on freshwater rivers and streams submitted to high drought, in thermophilous thermo-mesomediterranean, in Western Mediterranean and North Africa.

Typus: Rubo ulmifolii-Nerietum oleandri O. Bolòs 1955.

Characteristic species: *Vitex agnus-castus*.

55.2.1. *Oenanthe crocatae-Nerietum oleandri* Rivas-Martínez & Fuente in Fuente, Rufo; Rodríguez González & Amils in Lazaroa 28: 7, 2007 (fig. 56, page 114)

[sensu auct. lus. *Rubo ulmifolii-Nerietum oleandri* non O. Bolòs 1955]

55.3. *Flueggeion tinctoriae* Rivas Goday 1964 ex Rivas-Martínez 1975 nom. mut.

[*Securinegion buxifoliae* Rivas Goday 1964 nom. inv. (art.95)]

Flueggea tinctoria communities on siliceous leptosols, occupying the beds of torrential Mediterranean rivers, temporarily inundated, but only after long periods of rain by “soft” or slightly “hard” waters, in thermo-mesomediterranean bioclimate, with Lusitanian-Extremadurean distribution.

Typus: Pyro bourgaeanae-Flueggeetum tinctoriae (Rivas Goday 1964) Rivas-Martínez & Rivas Goday 1975 nom. mut. (*Securinego buxifoliae-Pyretum “marianicum”* Rivas Goday 1964) (55.3.1.).

Characteristic species: *Flueggea tinctoria*, *Thapsia transtagana*.

55.3.1. *Pyro bourgaeanae-Flueggeetum tinctoriae* (Rivas Goday 1964) Rivas-Martínez & Rivas Goday 1975 nom. mut. (fig. 57, page 114)

[*Securinego buxifoliae-Pyretum “marianicum”* Rivas Goday 1964 (art. 34); *Pyro bourgaeanae-Securinegetum tinctoriae* (Rivas Goday 1964) Rivas-Martínez & Rivas Goday 1975, *Rubo ulmifolii-Securinegetum tinctoriae* J. A. López & Velasco 1995 (syntax syn.)]

56. SALICI PURPUREAE-POPULETEA NIGRAE (Rivas-Martínez & Cantó ex Rivas-Martínez, Bascónes, T.E. Díaz, Fernández-González & Loidi) Rivas-Martínez & Cantó 2002

Edaphohydrophilous riparian deciduous forests, on hydromorphic soils, with Eurosiberian and Mediterranean distribution.

Typus: Populetales albae Br.-Bl. ex Tchou 1948 (56a.).

Characteristic species: *Alnus glutinosa*, *Brachypodium sylvaticum*, *Elymus caninus*, *Equisetum telmateia*, *Frangula alnus* subsp. *alnus*, *Humulus lupulus*, *Populus nigra*, *Saponaria officinalis*, *Solanum dulcamara*, *Vitis vinifera* subsp. *sylvestris*.

56a. POPULETALIA ALBAE Br.-Bl. ex Tchou 1948

Meso to microphanerophytic riverine communities, that that develop on mostly fluvisols with the groundwater table near the surface.

Typus: Populion albae Br.-Bl. ex Tchou 1948 (56.1.).

Characteristic species: *Aconitum napellus* subsp. *lusitanicum*, *Aristolochia paucinervis*, *Carex pendula*, *Carex remota*, *Circaea lutetiana*, *Equisetum ramosissimum*, *Lamium flexuosum*, *Malus sylvestris*, *Osmunda regalis*, *Polystichum setiferum*, *Populus alba*, *Prunus padus*, *Pyrus pyraister*, *Ranunculus ficaria* subsp. *ficaria*, *Ranunculus ficaria* subsp. *ficariiformis*, *Salix atrocinerea*, *Thelypteris pozoi* (ter.), *Vinca difformis*.

56.1. *Populion albae* Br.-Bl. ex Tchou 1948

Western Mediterranean and North African riparian forests, on soils rich in nutrients, which colonize the slow currents of riverbanks and eutrophic waters.

Typus: Populetales albae Br.-Bl. ex Tchou 1948.

Characteristic species: *Arum cylindraceum*, *Arum italicum* subsp. *italicum*, *Bryonia dioica*, *Colchicum multiflorum*, *Glycyrrhiza glabra*, *Iris foetidissima*.

56.1a. *Populion albae* (fig. 58, page 115)

Communities that colonize the river margins (in a position closer to the river), often flooded by slightly “hard” to “very hard” waters in the Western Mediterranean and Maghrebi.

Typus: Populetales albae Br.-Bl. ex Tchou 1948.

Characteristic species: *Salix neotricha*.

56.1.1. *Clematido campaniflorae-Salicetum neotrichae* J.C. Costa, Neto, Capelo, Lousã & Rivas-Martínez in Plant Biosyst. 145 (3): 555-556, 2011 (fig. 59, page 115)

56.1.2. *Nerio oleandri-Populetales albae* A. Garcia & Cano in A. Garcia, Torres, Pinto-Gomes, Leite, Salazar, Melendo, J. Nieto & Cano 1998

56.1.3. *Salici atrocinereae-Populetales albae* Rivas Goday 1964

56.1.4. *Salici neotrichae-Populetales nigrae* T.E. Díaz & Penas ex Rivas-Martínez & Cantó 2002

56.1b. *Fraxino angustifoliae-Ulmenion minoris* Rivas-Martínez 1975

Communities of the rivers flood prone (part of the floodplain rarely inundated) with “soft” to “hard” waters, thermo to supramediterranean, West Mediterranean, and Northern Maghreb distribution, with Galician-Portuguese disjunctions.

Typus: Quercu pyrenaicae-Fraxinetum angustifoliae Rivas Goday 1964 corr. Rivas-Martínez, Fernández-González & A. Molina in Fernández-González & A. Molina 1988 (56.1.13.).

Characteristic species: *Celtis australis*, *Fraxinus angustifolia* subsp. *angustifolia*, *Prunus lusitanica*, *Ulmus minor*.

56.1.5. *Clematido campaniflorae-Celtidetum australis* Monteiro-Henriques, J.C. Costa, A. Bellu, Aguiar & Portela Pereira ass. nova hoc loco

56.1.6. *Ficario ranunculoidis-Fraxinetum angustifoliae* Rivas-Martínez & Costa in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980 (fig. 56, 57, page 114)

56.1.7. *Frangulo alni-Prunetum lusitanicae* C. Lopes, J.C. Costa, Lousã & Capelo in J.C. Costa, C. Lopes, Capelo & Lousã 2000 (fig. 60, page 115)

- 56.1.8. *Hedero hibernicae-Fraxinetum angustifoliae* Rivas-Martínez ex Amigo, Pulgar & Izco in Lazaroa 30: 183, 2009
- 56.1.9. *Irido foetidissimae-Fraxinetum angustifoliae* (Pinto-Gomes & Cano 1998) Portela-Pereira, J.C. Costa, Neto, Monteiro-Henriques & Pinto-Gomes st. nov. hoc loco
[basion. *Ficario ranunculoidis-Fraxinetum angustifoliae quercetosum broteroi* Pinto-Gomes & Cano in A. Garcia, Torres, Pinto-Gomes, Leite, Salazar, Melendo, J. Nieto & Cano 1998]
- 56.1.10. *Luzulo henriquesii-Prunetum lusitanicae* Honrado, P. Alves, Lomba, Torres & B. Caldas in Acta Bot. Gallica: 154(1): 71, 2007
- 56.1.11. *Oenanthe crocatae-Quercetum pyrenaicae* J.C. Costa, Espírito Santo & Arsénio in Quercetea 10: 31, 2010
[community of *Fraxinus angustifolia* and *Quercus pyrenaica* M. Pereira 2009]
- 56.1.12. *Omphalodo nitidae-Fraxinetum angustifoliae* Monteiro-Henriques, J.C. Costa, A. Bellu, Aguiar & Portela Pereira ass. nova hoc loco
- 56.1.13. *Quercus pyrenaicae-Fraxinetum angustifoliae* Rivas Goday 1964 corr. Rivas-Martínez, Fernández-González & A. Molina in Fernández-González & A. Molina 1988
- 56.1.14. *Vincetoxicum difformis-Ulmetum minoris* V. Silva, Portela-Pereira, J.C. Costa, Arsénio, Monteiro-Henriques & Neto in V. Silva, Portela-Pereira, J.C. Costa, Arsénio, Monteiro-Henriques, Neto & Pinto-Cruz in Acta Bot. Malacitana 37: 2012
[sensu auct. lus. *Opopanax chironii-Ulmetum minoris* non Bellot & Ron in Bellot, Ron & Carballal 1979, *Aro-Ulmetum minoris* non Rivas-Martínez ex G. López 1976, *Aro italici-Ulmetum minoris* non Rivas-Martínez ex Fuente 1986]
- 56.2. Osmundo-Alnion** (Br.-Bl., P. Silva & Rozeira 1956) Dierschke & Rivas-Martínez in Rivas-Martínez 1975

Alders and willows (*Salix atrocinerea*) communities of oligotrophic rivers and seasonal streams with “soft” or slightly “hard” rushing water on poor sandy siliceous soils, in thermo to supramediterranean and meso to supratemperate bioclimate and Mediterranean and Galician-Portuguese distribution.

Typus: Scrophulario scorodoniae-Alnetum glutinosae Br.-Bl., P. Silva & Rozeira 1955 (56.2.6.).

Characteristic species: *Campanula primulifolia*, *Clematis campaniflora*, *Scrophularia scorodonia*.

- 56.2.1. *Campanulo primulifoliae-Alnetum glutinosae* Br.-Bl., P. Silva & Rozeira ex J.C. Costa, Capelo & Lousã in Silva Lusit. 12 (1): 127, 2004
- 56.2.2. *Carici reuteriana-Betuletum celtibericae* (Honrado, P. Alves, Aguiar, Ortiz & B. Caldas 2003) Honrado in Silva Lusit. 11(2): 239, 2004
- 56.2.3. *Galio broteriani-Alnetum glutinosae* Rivas-Martínez, Fuente & Sánchez-Mata 1986

- 56.2.4. *Senecioni bayonensis-Alnetum glutinosae* Amigo, J. Guitián & F. Prieto 1987
[*Narcisso cyclaminei-Alnetum glutinosae* Honrado, P. Alves, R. Pereira & B. Caldas in Honrado, P. Alves, Nepomuceno & B. Caldas in Silva Lusit. 10(2): 247, 2002 syntax syn.]
- 56.2.5. *Rubo corylifolii-Salicetum atrocineriae* Rivas-Martínez 1965
- 56.2.6. *Scrophulario scorodoniae-Alnetum glutinosae* Br.-Bl., P. Silva & Rozeira 1955 (fig. 61, page 116)

56b. SALICETALIA PURPUREAE Moor 1958

Pioneer vegetation of the lower margins of rivers and streams, that flow irregularly and are often flooded, constituted by arboreous and shrubby willows, in the Mediterranean and Eurosiberian regions.

Typus: Salicion albae Tüxen ex Moor 1958.

Characteristic species: *Salix alba*, *Salix fragilis*, *Salix pedicellata*, *Salix purpurea* subsp. *lambertiana*, *Salix x rubens*, *Salix triandra* subsp. *discolor*, *Salix x multidentata*.

56.3. Salicion salviifoliae Rivas-Martínez, T.E. Díaz, F. Prieto, Loidi & Penas 1984

Communities of willows on siliceous areas, colonizers of rivers and streams of oligotrophic “soft” to slightly “hard” waters. In thermo to supramediterranean, Mediterranean West Iberian, Iberian-Sorian and Galician-Portuguese territories.

Typus: Salicetum lambertiano-salviifoliae Rivas-Martínez 1965 corr. Rivas-Martínez, Fernández-González & Sánchez-Mata 1986

Characteristic species: *Salix salviifolia* subsp. *australis*, *Salix salviifolia* subsp. *salviifolia*, *Salix x pseudosalviifolia*, *Salix x secalliana*.

- 56.3.1. *Salicetum atrocinereo-australis* J.C. Costa & Lousã in J.C. Costa, Lousã & Paes 1998 (fig. 31, , page 108)

- 56.3.2. *Salicetum salviifoliae* Oberdorfer & Tüxen in Tüxen & Oberdorfer 1958

IXb. EUROSIBERIAN AND MEDITERRANEAN CLIMATIC ZONAL AND POTENTIAL NATURAL VEGETATION

57. LAURO AZORICAE-JUNIPERETEA BREVIFOLIAE Rivas-Martínez, Lousã, F. Prieto, J.C. Costa, Dias & Aguiar in Itinera Geobot. 15 (1): 126-130, 2002

Azorean evergreen broad-leaved micro to mesoforests, acicular-leaved nano to microforests and seral tall (microphanerophytic) shrublands, with a hyperoceanic thermomediterranean and thermo- to supratemperate humid-ultrahyperhumid optimum, mostly inhabiting nutrient poor andosols, that in cold and rainy zones are covered by a thick acid horizon of organic matter or by a deep ombrogenous blanket bog

Typus: Ericetalia azoricae Lüpnitz 1975 (57a.)

Characteristic species: *Arceuthobium azoricum*, *Athyrium filix-femina* (ter.), *Bellis azorica*, *Blechnum spicant* (ter.), *Carex hochstetteriana*, *Cerastium vagans*, *Culcita macrocarpa* (ter.), *Dryopteris aemula* (ter.), *Dryopteris azorica*, *Dryopteris crispifolia*, *Dryopteris filix-mas* (ter.), *Elaphoglossum semicylindricum* (dif.), *Hedera azorica*, *Juniperus brevifolia*, *Myrsine retusa*, *Platanthera micrantha*, *Smilax divaricate*, *Teucrium scorodonia* (ter.).

57a. ERICETALIA AZORICAE Lüpnitz 1975 [in Bot. Jahrb. 95(2): 155. 1975]

Edaphophilous acicular-leaved nano to microforests on leptosols or deeper soils with an iron pan (placic horizon), at higher altitudes and seral tall shrublands, in infra to supratemperate humid to ultrahyperhumid bioclimate.

Typus: Culcito macrocarpae-Juniperion brevifoliae Sjögren ex Lüpnitz 1975 (57.1.).

Characteristic species: *Corema azorica*, *Erica azorica*, *Grammitis marginella* subsp. *azorica*, *Hypericum foliosum*, *Myrtus communis* (ter.), *Rubus hochstetterorum*, *Rubus ulmifolius* (ter.), *Vaccinium cylindraceum*, *Viburnum treleasei* (= *V. subcordatum*).

57.1. Culcito macrocarpae-Juniperion brevifoliae Sjögren ex Lüpnitz 1975

Single alliance.

Typus: Daphno-Ericetum azoricae Lüpnitz 1975 (57.1.2.).

57.1a. Culcito macrocarpae-Juniperion brevifoliae Rivas-Martínez, Lousã, F. Prieto, J.C. Costa, Dias & Aguiar 2002

Meso- to supratemperate associations.

Typus: Daphno-Ericetum azoricae Lüpnitz 1975 (57.1.2.).

57.1.1. *Cerastio vulgare-Juniperetum brevifoliae* Lüpnitz 1975 corr. Rivas-Martínez, Lousã, F. Prieto, J.C. Costa, Dias & Aguiar 2002

57.1.2. *Daphno-Ericetum azoricae* Lüpnitz 1975

57.1.3. *Euphrasio grandiflorae-Viburnetum treleasei* Lüpnitz 1975 corr. F. Prieto & Aguiar in F. Prieto, Aguiar & Dias in Int. J. Geobot. Res. 2: 115. 2012.

[*Euphrasio grandiflorae-Viburnetum subcordati* Lüpnitz 1975]

57.1.4. *Picridio filii-Euphorbietum stygiana* Lüpnitz 1975

57.1b. Pteridio aquilini-Ericenion azoricae Rivas-Martínez, Lousã, F. Prieto, J.C. Costa, Dias & Aguiar 2002 corr. F. Prieto, Dias & Aguiar in F. Prieto, Aguiar & Dias in Int. J. Geobot. Res. 2: 115. 2012.

[*Pteridio pubescentis-Ericenion azoricae* Rivas-Martínez, Lousã, F. Prieto, J.C. Costa, Dias & Aguiar 2002, Itinera Geobot. 15(1): 127, original name]

Thermomediterranean and thermotemperate associations, occasionally lower mesotemperate.

Typus: Pteridio aquilini-Ericetum azoricae Rivas-Martínez, Lousã, F. Prieto, J.C. Costa, Dias & Aguiar 2002 corr. F. Prieto, Dias & Aguiar in F. Prieto, Aguiar & Dias 2012 (57.1.6.).

57.1.5. *Festuco petraeae-Coremetum azoricae* Rivas-Martínez, Lousã, F. Prieto, J.C. Costa, Dias & Aguiar 2002

57.1.6. *Pteridio aquilini-Ericetum azoricae* Rivas-Martínez, Lousã, F. Prieto, J.C. Costa, Dias & Aguiar 2002 corr. F. Prieto, Dias & Aguiar in F. Prieto, Aguiar & Dias in Int. J. Geobot. Res. 2: 115. 2012. (fig. 62, page 116)

[= *Pteridio pubescentis-Ericetum azoricae* Rivas-Martínez, Lousã, F. Prieto, J.C. Costa, Dias & Aguiar 2002]

57b. FRANGULO AZORICAE-LAURETALIA AZORICAE F. Prieto, Dias & Aguiar in F. Prieto, Aguiar & Dias in Int. J. Geobot. Res. 2: 115. 2012.

Azorean evergreen broad-leaved edaphoxerophilous, mesic or hygrophilous micro- and mesoforests.

Typus: Dryopterido azoricae-Laurion azoricae Rivas-Martínez, Lousã, F. Prieto, J.C. Costa, Dias & Aguiar 2002 (57.2.).

Characteristic species: *Laurus azorica*.

57.2. Dryopterido azoricae-Laurion azoricae Rivas-Martínez, Lousã, F. Prieto, J.C. Costa, Dias & Aguiar 2002 [in Itinera Geobot. 15 (1): 130. 2002]

Meso-supratemperate hyperhumid to ultrahyperhumid hyperoceanic Azorean mesic or hygrophilous micro-mesoforests growing on developed andosols, in meso-supratemperate hyperhumid and ultrahyperhumid hyperoceanic bioclimate.

Typus: Dryopterido azoricae-Lauretum azoricae Rivas-Martínez, Lousã, F. Prieto, J.C. Costa, Dias & Aguiar 2002 (57.2.2.).

Characteristic species: *Carex vulcani* (dif.), *Frangula azorica*, *Ilex azorica*, *Prunus azorica*, *Sanicula azorica*.

57.2.1. *Culcito macrocarpae-Ilicetum azoricae* F. Prieto, Dias & Aguiar in F. Prieto, Aguiar & Dias in Int. J. Geobot. Res. 2: 116. 2012.

57.2.2. *Dryopterido azoricae-Lauretum azoricae* Rivas-Martínez, Lousã, F. Prieto, J.C. Costa, Dias & Aguiar 2002

57.2.3. *Woodwardio radicans-Prunetum azoricae* Rivas-Martínez, Lousã, F. Prieto, J.C. Costa, Dias & Aguiar 2002

57.3. Myricio fayae-Pittosporion undulati Lüpnitz 1976 [in Beitr. Biol. Pflanzen 51: 265. 1976]

Thermomediterranean or thermotemperate humid micro-mesoforests, frequently strongly disturbed by human activities and often enriched in synanthropic trees and other perennial exotic plants.

Typus: Hedychio gardnerani-Pittosporium undulati Lüpnitz 1976 (57.2.2.).

Characteristic species: *Carex hochstetteriana* (dif.), *Hedychium gardnerianum*, *Myrica faya* (terr.), *Piconia azorica*, *Pittosporium undulatum*.

57.3.1. *Carici hochstetterianae-Picconietum azoricae* Rivas-Martínez, Lousã, F. Prieto, J.C. Costa, Dias & Aguiar 2002

57.3.2. *Hedychio gardnerani-Pittosporium undulati* Lüpnitz 1976
[*Myrica fayae-Pittosporium undulati* Lüpnitz 1976]

58. JUNIPERO SABINAE-PINETEA IBERICAE Rivas-Martínez 1965 nom. inv.

[*Pino-Juniperetea*] Rivas-Martínez 1965

Micro to mesophanerophytic evergreen woods, often relict, dominated by conifers (*Juniperus* spp., *Pinus* spp.) or leguminous, climactic of mountain highlands in cold climates of Southwest Europe; in meso-oromediterranean supra to lower orotemperate, semiarid to hyperhumid, Western Mediterranean and Alpine-Caucasian territories.

Typus: Junipero sabiniae-Pinetalia ibericae Rivas-Martínez 1965.

Characteristic species: *Avenella flexuosa* subsp. *iberica*, *Pinus sylvestris* var. *iberica*.

58b. JUNIPERETALIA HEMISPHAERICAE Rivas-Martínez & J.A. Molina in Rivas-Martínez, Fernández-González & Loidi 1999

Climatophilous or seral communities dominated by creeping shrubs (mostly *Juniperus* spp.), oromediterranean and orotemperate submediterranean, subhumid to hyperhumid, Orocantabrian Southern Carpetan, Estrelensean, Oroiberian, Baetic and Nevadensien.

Typus: Genisto versicolor-Juniperion hemisphaericae Rivas-Martínez & J.A. Molina in Rivas-Martínez, Fernández-González & Loidi 1999.

Characteristic species: *Juniperus communis* subsp. *hemisphaerica*.

58.1. Cytision oromediterranei Tüxen in Tüxen & Oberdorfer 1958 corr. Rivas-Martínez 1987

Siliceous oromediterranean and orotemperate submediterranean humid to hyperhumid Juniper communities, in Carpetan-Leonese, Estrelensean and Southern Orocantabrian areas.

Typus: Senecioni carpetani-Cytisetum oromediterranei Tüxen & Oberdorfer 1958 corr. Rivas-Martínez 1987.

Characteristic species: *Echinopartum ibericum* subsp. *pulviniformis*, *Juniperus communis* subsp. *alpina* (terr.), *Vaccinium uliginosum* subsp. *microphyllum* (terr.).

58.1.1. *Lycopodio clavati-Juniperetum nanae* Br.-Bl., P. Silva & Rozeira in Rivas-Martínez 1974 (fig. 63, page 116)

58.2.1. *Teucrio salviastris-Echinopartetum pulviniformis* Rivas-Martínez 1974 corr. Rivas-Martínez 1981

59. QUERCETEA ILICIS Br.-Bl. ex A. & O. Bolòs 1950

Woodlands, pre-woodlands and dense scrublands, evergreen or marcescent, that usually create a shady environment contributing to a soil humus type of forest "mull". Indifferent to the chemical nature of the substrate and soil, however limited by permanent or temporary hydromorphy. Include the climatophilous vegetation and its mantle, edges and the first stage of replacement of the forests in the Mediterranean Region, in semiarid to humid infra to supramediterranean, reaching meridional submediterranean Eurosiberian territories.

Typus: Quercetalia ilicis Br.-Bl. ex Molinier 1934 em. Rivas-Martínez 1975 (59a.).

Characteristic species: *Asparagus acutifolius*, *Biarum arundanum*, *Carex halleriana*, *Clematis flammula*, *Daphne gnidium*, *Lonicera etrusca* var. *etrusca*, *Lonicera implexa*, *Neotinea maculata*, *Olea europaea* var. *sylvestris*, *Phillyrea latifolia* subsp. *media*, *Pulicaria odora*, *Rhamnus alaternus* subsp. *alaternus* f. *alaternus*, *Rubia peregrina* subsp. *longifolia*, *Rubia peregrina* subsp. *peregrina*, *Smilax aspera* var. *aspera*, *Vincetoxicum nigrum*.

59a. QUERCETALIA ILICIS Br.-Bl. ex Molinier 1934 em. Rivas-Martínez 1975

Evergreen or marcescent climatophilous forests, creators of shade and forest humus, thermo to supramediterranean dry to hyperhumid, Mediterranean. Understory rich in sclerophyllous evergreen leaves, shrubs and lianas, except in the cold supramediterranean areas.

Typus: Quercion ilicis Br.-Bl. ex Molinier 1934.

Characteristic species: *Anemone palmata*, *Asplenium onopteris*, *Bupleurum paniculatum*, *Carex depressa*, *Carex distachya*, *Carex oedipostyla*, *Doronicum plantagineum*, *Juniperus oxycedrus* subsp. *lagunae*, *Limodorum trabutianum*, *Melica minuta* subsp. *arrecta*, *Moehringia pentandra*, *Phillyrea latifolia* subsp. *latifolia*, *Piptatherum paradoxum*, *Quercus canariensis*, *Quercus rotundifolia*, *Quercus suber*, *Quercus x airenensis*, *Quercus x mixta*, *Rosa sempervirens*, *Ruscus aculeatus*, *Viburnum tinus*.

59.1. Quercion broteroi Br.-Bl., P. Silva & Rozeira 1956 em. Rivas-Martínez 1975 corr. V. Fuente 1986

[*Quercion fagineae* Br.-Bl., P. Silva & Rozeira 1956; *Quercion fagineo-suberis* Br.-Bl., P. Silva & Rozeira 1956 em. nom. Rivas-Martínez 1975]

Sclerophyllous or marcescent forests, in thermo to supramediterranean dry to humid, Coastal Lusitanian-Andalusian and Mediterranean Iberian Atlantic territories.

Typus: Arisaro-Quercetum broteroi Br.-Bl., P. Silva & Rozeira 1955 corr. Rivas-Martínez 1975 (59.1.1.).

Characteristic species: *Genista tournefortii*, *Hyacinthoides hispanica*, *Luzula forsteri* subsp. *baetica*, *Paeonia broteroi*, *Pyrus bourgaeana*, *Quercus broteroi*, *Quercus robur* subsp. *estremadurensis*, *Quercus x coutinhoi* nothosubsp. *beturica* (*Q. robur* subsp. *estremadurensis* x *Q. broteroi*), *Quercus x andegavensis* nothosubsp. *subandegavensis* (*Q. robur* subsp. *estremadurensis* x *Q. pyrenaica*).

59.1a. Quercenion broteroi Rivas-Martínez 1987

Oceanic subhumid to humid forests of *Quercus suber*, *Quercus broteroi* and *Quercus canariensis*.

Typus: Arisaro-Quercetum broteroi Br.-Bl., P. Silva & Rozeira 1955 corr. Rivas-Martínez 1975 (59.1.1.).

Characteristic species: *Digitalis tomentosa*, *Epipactis lusitanica*, *Euphorbia monchiquensis*, *Quercus x marianica*, *Sanguisorba hybrida*, *Thapsia nitida* subsp. *nitida*.

59.1.1. *Arisaro simorrhini-Quercetum broteroi* Br.-Bl., P. Silva & Rozeira 1955 corr. Rivas-Martínez 1975 (fig. 64, page 116)

59.1.2. *Euphorbio monchiquensis-Quercetum canariensis* Malato-Beliz in Rivas-Martínez, Louçã, T.E. Díaz, Fernández-González & J.C. Costa 1990

59.1.3. *Junipero lagunae-Quercetum suberis* Rivas-Martínez, Aguiar, Cantó & Ladero 2002

59.1.4. *Physospermo cornubiensis-Quercetum suberis* Rivas-Martínez 1987
[*Rusco aculeati-Quercetum suberis quercetosum suberis* nom. nud.]

- 59.1.5. *Pistacio terebinthi-Quercetum broteroi* Rivas Goday in Rivas Goday, Borja, Esteve, Galiano, Rigual & Rivas-Martínez 1960
- 59.1.6. *Quercetum alpestris-broteroi* Pinto-Gomes & P. Ferreira in Flora e Vegetação do Barrocal Algarvio. Tavira-Portimão: 258, 2005
- 59.1.7. *Sanguisorbo hybridae-Quercetum suberis* Rivas Goday in Rivas Goday, Borja, Esteve, Galiano, Rigual & Rivas-Martínez 1960 nom. mut.
[*Poterio agrimonioidis-Quercetum suberis* Rivas Goday in Rivas Goday, Borja, Esteve, Galiano, Rigual & Rivas-Martínez 1960]
- 59.1.8. *Sanguisorbo hybridae-Quercetum broteroi* M. Pereira in Guineana 15: 272, 2009
- 59.2.9. *Teucro salviastri-Quercetum suberis* C. Meireles, P. Ferreira, Passos, Vila-Viçosa & Pinto-Gomes in Pinto-Gomes, P. Ferreira & Meireles in Lazaroa 28: 75, 2007
- 59.2.10. *Ulici welwitschiani-Quercetum broteroi* Vila-Viçosa, P. Mendes, Del Rio, C. Meireles, Quinto-Canas, Arsénio & Pinto-Gomes in Plant Biosyst. 146 (1): 5, 2012

59.1b. Paenion broteroi-Quercenion rotundifoliae
Rivas-Martínez in Rivas-Martínez, Costa & Izco 1986

Semi-continental and continental dry to humid forests of *Quercus rotundifolia*.

Typus: *Junipero lagunae-Quercetum rotundifoliae* Rivas Goday ex Rivas-Martínez 1965 corr. Rivas-Martínez in Itinera Geobot. 18(1): 363, 2011.

Characteristic species: *Thapsia maxima*.

- 59.1.10. *Genisto hystricis-Quercetum rotundifoliae* P. Silva 1970
- 59.1.11. *Lonicero implexae-Quercetum rotundifoliae* Lousã, Espírito Santo & J.C. Costa 1994 (fig. 65, page 116)
- 59.1.12. *Pyro bourgaeanae-Quercetum rotundifoliae* Rivas-Martínez 1987
- 59.1.13. *Rusco aculeati-Juniperetum lagunae* (J.C. Costa, Capelo, Lousã & Aguiar 1993) Aguiar, Amado, Honrado, J.C. Costa & Capelo in Aguiar, J.C. Costa, Capelo, Amado, Honrado, Espírito Santo & Lousã in Silva Lusit. 11 (1): 103, 2003 (fig. 66, page 117)
[*Genisto hystricis-Quercetum rotundifoliae juniperetosum oxycedri* J.C. Costa, Capelo, Lousã & Aguiar 1993]
- 59.1.14. *Teucro salviastri-Quercetum rotundifoliae* Pinto-Gomes, Ladero, Cano, Meireles, Aguiar & P. Ferreira in Acta Bot. Gallica 157 (1): 29, 2010

59.2. Quercus rotundifoliae-Oleion sylvestris Barbéro, Quézel & Rivas-Martínez in Rivas-Martínez, Costa & Izco 1986

Thermomediterranean dry to humid meso-microforests in Western Mediterranean subregion; usually with thermomediterranean perennial herbs, shrubs and lianas in the understory.

Characteristic species: *Arisarum simorrhinum*, *Arum italicum* subsp. *neglectum*, *Asparagus aphyllus*, *Avenella stricta*, *Clematis cirrhosa*, *Gennaria diphylla*, *Quercus coccifera* subsp. *rivas-martinezii*, *Scilla monophyllos*, *Smilax aspera* var. *altissima*.

Alliance differential: *Aristolochia baetica*, *Asparagus albus*, *Calicotome villosa*, *Ceratonion siliqua*, *Chamaerops humilis*, *Ephedra fragilis*, *Juniperus turbinata*, *Myrtus communis*, *Osyris quadripartita*, *Quercus lusitanica*, *Prasium majus*, *Rhamnus oleoides*.

Typus: *Myrto communis-Quercetum suberis* Barbéro, Benabid, Quézel & Rivas-Martínez 1981 ex Rivas-Martínez, Costa & Izco 1986.

59.2a. Quercus rotundifoliae-Oleion sylvestris

Thermomediterranean *Quercus rotundifolia*, *Quercus suber*, *Olea sylvestris* and *Ceratonion siliqua* forests in Western Mediterranean.

- 59.2.1. *Aro neglecti-Oleum sylvestris* Rivas-Martínez & P. Cantó 2002 corr. Rivas-Martínez in Itinera Geobot. 18(1): 363, 2011
[*Aro italici-Oleum sylvestris* Rivas-Martínez & P. Cantó 2002]
- 59.2.2. *Aro neglecti-Quercetum suberis* Rivas-Martínez & Díez Garretas in Itinera Geobot. 18(2): 426, 2011
[*Oleo sylvestris-Quercetum suberis* sensu Rivas-Martínez 1987, auct. lus. non Rivas Goday, F. Galiano & Rivas-Martínez in Rivas-Martínez 1987]
- 59.2.3. *Asparago albi-Oleum sylvestris* Cantó, Ladero, Pérez-Chiscano & Rivas-Martínez in Itinera Geobot. 18(2): 428, 2011
- 59.2.4. *Myrto communis-Quercetum rotundifoliae* Rivas Goday in Rivas Goday, Borja, Esteve, Galiano, Rigual & Rivas-Martínez 1960
- 59.2.5. *Rhamno laderoi-Quercetum rotundifoliae* Rivas-Martínez, Ladero & M.T. Santos in Itinera Geobot. 18(2): 463, 2011
- 59.2.6. *Rhamno oleoidis-Quercetum rotundifoliae* Rivas-Martínez in Rivas-Martínez, Fernández-González, Loidi, Lousã & Penas 2000
[*Smilaco mauritanicae-Quercetum rotundifoliae sensu* Rivas-Martínez 1987 non Barbéro, Quézel & Rivas-Martínez ex Rivas-Martínez 1987]
- 59.2.7. *Smilaco asperae-Quercetum suberis* Pinto-Gomes, Ladero, P. Gonçalves, S. Mendes & M.C. Lopes in Quercetea 4: 25, 2004
- 59.2.8. *Viburno tini-Oleum sylvestris* J.C. Costa, Capelo & Lousã 1994
- 59.2.9. *Vinco difformis-Ceratonion siliquae* (Martín, Díez-Garretas & Asensi 1992) Rivas-Martínez 2002

59.2b. Quercenion rivasmartinezii-suberis Capelo suball. nova hoc loco

Forests of *Quercus suber* and *Quercus rivasmartinezii* on silicon substrates or compact decarbonated limestone, thermomediterranean or, exceptionally, lower mesomediterranean, subhumid to upper humid, with intense oceanic character (subhyperoceanic, hyperoceanic, euoceanic), in Coastal Lusitanian-Andalusian Province.

Characteristic species: *Avenella stricta*, *Quercus rivasmartinezii*.

Differential species: *Bupleurum fruticosum*, *Centaurea crocata*, *Centaurea vicentina*, *Lavandula viridis*, *Myrica faya*, *Picris spinifera* s.l., *Quercus x marianica*, *Rhododendretum ponticum*, *Senecio lopesii*.

Typus: *Viburno tini-Quercetum cocciferae* Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa in *Itinera Geobot.* 3: 54, 1990 corr. *Viburno tini-Quercetum rivasmartinezii* Capelo & J.C. Costa in *Silva Lusit.* 9 (2): 271, 2001 (59.2.13.)

59.2.10. *Asparago aphylli-Quercetum suberis* J.C. Costa, Capelo, Lousã & Espírito Santo 1996

59.2.11. *Lauro nobilis-Quercetum rivasmartinezii* R. Caraça, J.C. Costa, Neto & Espírito Santo in J.C. Costa, R. Caraça, Neto, Espírito Santo & Capelo ined. [in *Quercetea* 11]

59.2.12. *Lavandulo viridis-Quercetum suberis* Quinto-Canas, Vila-Viçosa, Meireles, P. Ferreira, Martínez-Lombardo, Cano & Pinto-Gomes in *Acta Bot. Gallica* 157(4): 631, 2010 (fig. 67, page 117)

[*Myrto communis-Quercetum suberis sensu* Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990 non Barbero, Benabid, Quézel & Rivas-Martínez 1981 ex Rivas-Martínez, Costa & Izco 1986, *Teucro baetica-Quercetum suberis* Rivas-Martínez in Díez Garretas, Cuenca & Asensi 1986 *centauretosum crocatae* Neto, Arsénio & J.C. Costa *Quercetea* 9: 45, 2010, *Teucro baeticae-Quercetum suberis senecetosum lopesii* Capelo 2007 nom. inval. (art. 1)]

59.2.13. *Viburno tini-Quercetum rivasmartinezii* Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990 corr. Capelo & J.C. Costa 2001 (fig. 68, page 117)

[*Viburno tini-Quercetum cocciferae* Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990]

59b. *PISTACIO LENTISCI-RHAMNETALIA ALATERNI* Rivas-Martínez 1975

Sclerophyllous evergreen nano to microforests, exceptionally, mesoforests, thermo to supramediterranean lower semiarid to humid and in Western Mediterranean areas. They can represent the forest mantle (in *Quercetalia ilicis*) that when the trees disappear constitute a seral maquis or dwarf shrubs communities. In semiarid bioclimate, they constitute the climatophilous vegetation, but in dry to humid bioclimates, they can only form natural permanent communities on shallow or xeric biotopes, since they virtually represent the earliest replacement stages of the natural potential forests of *Quercetalia ilicis*.

Typus: *Asparago albi-Rhamnion oleoidis* Rivas-Goday ex Rivas-Martínez 1975 (59.3.).

Characteristic species: *Anagyris foetida*, *Asparagus albus*, *Barlia robertiana*, *Bupleurum fruticosum*, *Ceratonia siliqua*, *Chamaerops humilis*, *Coronilla glauca*, *Coronilla juncea*, *Ephedra fragilis* var. *fragilis*, *Euphorbia characias*, *Jasminum fruticans*, *Juniperus oxycedrus* subsp. *oxycedrus*, *Juniperus turbi-*

nata subsp. *turbinata*, *Myrtus communis*, *Osyris alba*, *Osyris quadripartita*, *Phillyrea angustifolia*, *Pinus halepensis*, *Pinus pinaster* subsp. *atlantica*, *Pistacia lentiscus*, *Pistacia terebinthus*, *Prasium majus*, *Quercus coccifera*, *Rhamnus alaternus* subsp. *alaternus* f. *neoparvifolia*, *Rhamnus lycioides* subsp. *laderoi*, *Teucrium fruticans*.

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

Permanent shrubs, mantle forests and maquis communities, thermomediterranean upper semiarid to sub-humid euoceanic, reaching, in a relict form, lower mesomediterranean thermophilous, in Coastal Lusitanian-Andalusian, Lusitanian-Extremadurean, Baetic, Murcian-Almerisean, Setabensean, Valencian-Tarraconensean and Maghrebi-Tingitanan territories.

Typus: *Asparago albi-Rhamnion oleoides* Rivas-Goday 1959 (59.3.3.).

Characteristic species: *Aristolochia baetica*, *Calicotome villosa*, *Euphorbia clementei*, *Euphorbia pedroi*, *Phlomis purpurea*, *Rhamnus oleoides*, *Thapsia nitida* subsp. *meridionalis*.

59.3.1. *Aristolochio baeticae-Juniperetum turbinatae* Pinto-Gomes & P. Ferreira in *Flora e Vegetação do Barrocal Algarvio*. Tavira-Portimão: 271, 2005

59.3.2. *Asparago albi-Quercetum cocciferae* Rivas-Martínez 2002

59.3.3. *Asparago albi-Rhamnion oleoides* Rivas-Goday 1959

59.3.4. *Asparago aphylli-Calicotometum villosae* Rivas-Martínez 1975

59.3.5. *Asparago aphylli-Myrtetum communis* Rivas-Martínez, Cantó, Fernández-González & Sánchez-Mata ex J.C. Costa, Lousã & Espírito Santo 1997

59.3.6. *Convolvulo fernandesii-Euphorbietum pedroi* Pedro ex Capelo in *Silva Lusit.* 11 (1): 124, 2003 (fig. 69, page 117)

59.3.7. *Cytiso eriocarpi-Juniperetum lagunae* Pinto-Gomes & Cano in Cano, Rodríguez-Torres, Pinto-Gomes, García-Fuentes, J.A. Torres, Salazar, Ruiz-Valenzuela, Cano-Ortiz & Montilla in *Acta Bot. Gallica* 154(1): 88, 2007 [Rubio longifoliae-Juniperetum oxycedri J.C. Costa, Capelo, Lousã & Aguiar 1993 nom. inval. (art. 3b)]

59.3.8. *Melico arrectae-Quercetum cocciferae* Br-Bl., P. Silva, & Rozeira 1955

59.3.9. *Phlomido purpureae-Juniperetum turbinatae* Capelo, Lousã & J.C. Costa 1991

59.3.10. *Phlomido purpureae-Pistacietum lentisci* Capelo & J.C. Costa ass nova hoc loco [Clematido cirrhosae-Pistacietum lentisci Capelo in Capelo, Lousã & J.C. Costa 1994 nom. inval. (art. 31), *Oleo sylvestris-Pistacietum lentisci* Capelo 1996 nom. inval. (art. 31)]

59.3.11. *Quercetum coccifero-airesis* Espírito Santo in Espírito Santo, J.C. Costa, Lousã & Capelo 1995

- 59.3.12. *Quercus cocciferae-Juniperetum turbinatae* (Rivas-Martínez 1975) Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990 (fig. 70, page 117)

59.4. *Juniperion turbinatae* Rivas-Martínez 1975 corr. 1987

Thermomediterranean semiarid to lower subhumid hyperoceanic and euoceanic permanent shrub communities, that represent a mature stage on paleodunes and dunes influenced by sea winds, in Western Mediterranean.

Typus: Osyrio quadripartitae-Juniperetum turbinatae Rivas-Martínez ex Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990 (59.4.2.).

Characteristic species: *Juniperus navicularis*.

- 59.4.1. *Daphno gnidii-Juniperetum navicularis* Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990 (fig. 71, page 117)

- 59.4.2. *Osyrio quadripartitae-Juniperetum turbinatae* Rivas-Martínez ex Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990 (fig. 72, page 118)

59.5. *Rubio longifoliae-Coremation albi* Rivas-Martínez in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980

Oligotrophic coastal dunes permanent communities, dominated by *Corema album*, often constituting the edges of *Osyrio-Juniperetum turbinatae*. Thermomediterranean to mesomediterranean dry to subhumid, Coastal Lusitanian-Andalusian and relicts in the Galician-Portuguese area.

Typus: Rubio longifoliae-Coremetum albi Rivas-Martínez in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980 (59.5.1.).

Characteristic species: *Antirrhinum linkianum* subsp. *cirrhigerum*, *Corema album*.

- 59.5.1. *Rubio longifoliae-Coremetum albi* Rivas-Martínez in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980 (fig. 73, page 118)

59.6. *Quercion lusitanicae* Barbero, Quézel & Rivas-Martínez 1981 nom. mut. (fig. 74, page 118) [in Phytocoenologia 9 (3): 370, 1981] [*Frutici-Quercion* Rothmaler 1954 in Vegetatio 56: 599 (art.34); *Quercion lusitanicae* Rothmaler 1954 ex. Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990 in Itinera Geobot. 3: 61 rel. neotypus, 1980 (art.22)]

Communities dominated by *Quercus lusitanica* on siliceous soils, which represent regressive stages of the thermophilous woodlands of cork trees. In thermomediterranean to lower mesomediterranean subhumid to humid, Coastal Lusitanian-Andalusian and Tingitanan territories.

Typus: Phillyreo angustifoliae-Quercetum lusitanicae Barbero, Quézel & Rivas-Martínez 1981 [in Phytocoenologia 9 (3): 370 tab. 23, 1981].

Characteristic species: *Centaurea africana*, *Centaurea crocata*, *Centaurea vicentina*, *Euphorbia transtaganica*, *Quercus lusitanica*, *Quercus x celtica* (*Q. lusitanica* x *Q. suber*), *Scorzonera transtaganica*, *Serratula*

rratula alcalae subsp. *aristata*, *Serratula monardii* var. *monardii*, *Serratula monardii* var. *algarbiensis*.

- 59.6.1. *Centaureo crocatae-Quercetum lusitanicae* Capelo, J.C. Costa & Lousã in Capelo, J.C. Costa, Lousã & Mesquita in Quercetea 3: 103-106, 2002

- 59.6.2. *Erico scopariae-Quercetum lusitanicae* Rothmaler ex Br.-Bl., P. Silva & Rozeira 1964

- 59.6.3. *Junipero navicularis-Quercetum lusitanicae* (Rothmaler 1954) Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990

59.7. *Ericion arboreae* Rivas-Martínez 1987

Relict shrubby evergreen and glossy communities, commonly on deep soils, representing pre-woods, edges or replacement stages of the climatophilous forests. In xerophytic biotypes they can form permanent communities. In thermomediterranean, mesomediterranean subhumid to hyperhumid bioclimate, Mediterranean and Cantabrian-Atlantic areas.

Typus: Phillyreo angustifoliae-Arbutetum unedonis Rivas Goday & Galiano in Rivas Goday et al. 1959 (59.7.5.)

Characteristic species: *Arbutus unedo*, *Erica arborea*.

59.6.a *Ericenion arboreae* Rivas-Martínez 1975

Nano to microphanerophytic communities, on acid or neutral soils.

Typus: Phillyreo angustifoliae-Arbutetum unedonis Rivas Goday & Galiano in Rivas Goday et al. 1959 (59.7.5.)

- 59.7.1. *Cisto populifolii-Arbutetum unedonis* Br.-Bl., P. Silva & Rozeira 1964 nom. inver. hoc loco [*Arbuto-Cistetum populifolii* Br.-Bl., P. Silva & Rozeira 1964]

- 59.7.2. *Cytiso grandiflori-Arbutetum unedonis* Monteiro-Henriques, J.C. Costa, A. Bellu, & Aguiar ass nova hoc loco

- 59.7.3. *Erico arboreae-Buxetum sempervirentis* Aguiar, Esteves & Penas 1999

- 59.7.4. *Erico scopariae-Arbutetum unedonis* Ortiz, Amigo & Izco 1991

- 59.7.5. *Phillyreo angustifoliae-Arbutetum unedonis* Rivas Goday & Galiano in Rivas Goday et al. 1959

59.7.b *Bupleurenion fruticosi* Torres, Pinto-Gomes, & Cano in Itinera Geobot. 18 (1): 371, 2011

Nano to microphanerophytic communities, on dolomitic limestone substrate and neutral to basic soils.

Typus: Bupleuro rigidi-Arbutetum unedonis Torres & Cano in Torres, F. Valle, Pinto-Gomes, A. Garcia, Salazar & Cano 2002

- 59.7.6. *Aristolochio baeticae-Arbutetum unedonis* Pinto-Gomes & Cano in Pinto-Gomes & P. Ferreira in Flora e Vegetação do Barrocal Algarvio. Tavira-Portimão: 276, 2005

- 59.7.7. *Bupleuro fruticosae-Arbutetum unedonis* Capelo, J.C. Costa & Rivas-Martínez in J.C. Costa, Capelo, Espírito Santo & Lousã in Silva Lusit. 10 (1): 119-120, 2002

59.8. *Arbuto unedonis-Laurion nobilis* Rivas-Martínez, Fernández-González & Loidi 1999

Microphanerophytic communities on siliceous substrate, rich in broadleaf lauroid relict species, on cliffs and ravines, or as woodland edges. With Iberian-Atlantic attenuated hyperoceanic distribution, in thermo to mesotemperate submediterranean and thermo to mesomediterranean humid areas.

Typus: Phillyreo latifoliae-Arbutetum unedonis (A. Velasco) Loidi, Herrera, Olano & Silván 1994.

Characteristic species: *Hedera maderensis* subsp. *iberica*, *Myrica faya* (ter.), *Laurus nobilis*, *Prunus lusitanica* (ter.).

59.8.a *Arbuto unedonis-Laurenion nobilis* Rivas-Martínez & Sanchez-Mata 2001

Laurel and strawberry tree communities in Cantabrian-Atlantic and Sadensean-Dividing Portuguese territories.

Typus: Phillyreo latifoliae-Arbutetum unedonis (A. Velasco) Loidi, Herrera, Olano & Silván 1994.

59.8.1. *Myrico fayae-Arbutetum unedonis* Capelo & Mesquita 1998

59.8.2. *Omphalodo nitidae-Lauretum nobilis* Honrado, P. Alves & B. Caldas in Honrado, P. Alves, Nepomuceno & B. Caldas in *Quercea* 5: 33, 2004

59.8.3. *Pruno lusitanicae-Arbutetum unedonis* (Aguiar & Capelo 1995) J.C. Costa, Capelo & Lousã in J.C. Costa, C. Lopes, Capelo & Lousã 2000

59.8.4. *Vinco difformis-Lauretum nobilis* Capelo & J.C. Costa in J.C. Costa, C. Lopes, Capelo & Lousã 2000

59.9.b. *Rhododendrenion pontici* Rivas-Martínez & Sánchez-Mata 2001 nom. mut.

[*Rhododendrenion baeticae* Rivas-Martínez & Sánchez-Mata 2001]

Thermo-mesomediterranean communities with *Rhododendron ponticum*, as the edge of *Quercus canariensis* or *Alnus glutinosa* forests Algibic, Monchi-quensean and Caramulensean.

Typus: Scrophulario laxiflorae-Rhododendretum pontici A. V. Pérez, Gálan & Cabezero 2000.

Characteristic species: *Rhododendron ponticum*.

59.9.5. *Calluno vulgaris-Rhododendretum pontici* Honrado, P. Alves, Lomba, Torres & B. Caldas 2007 nom. mut. prop.

[*Calluno vulgaris-Rhododendretum baetici* Honrado, P. Alves, Lomba, Torres & B. Caldas in *Acta Bot. Gallica*: 154(1): 74, 2007]

59.9.6. *Campanulo primulifoliae-Rhododendretum pontici* Vila-Viçosa, J.C. Costa, Quinto-Canas & Pinto-Gomes ass. nova hoc loco

60. QUERCO-FAGETEA SYLVATICAE Br.-Bl. & Vlieger in Vlieger 1937

Deciduous broad-leaved and mixed broad-leaved meso to macroforests, mostly climatophilous and not hydro-morphic (independent of water compensation). With a temperate optimum, in infra to lower orotemperate dry to ultrahyperhumid bioclimate. In the Eurosiberian Region,

also relict in the Mediterranean (meso to supramediterranean sub-humid to hyper-humid).

Typus: Fagetalia sylvaticae Pawłowski in Pawłowski, Sokołowski & Wallisch 1928 (60a.).

Characteristic species: *Acer campestre*, *Ajuga reptans*, *Anemone nemorosa*, *Aquilegia vulgaris* subsp. *vulgaris*, *Arum maculatum*, *Athyrium filix-femina*, *Cephalanthera longifolia*, *Cephalanthera rubra*, *Conopodium pyrenaicum*, *Crepis lampanoides*, *Daphne laureola* subsp. *laureola*, *Dryopteris affinis* subsp. *affinis*, *Dryopteris borreeri*, *Dryopteris dilatata*, *Dryopteris filix-mas*, *Epipactis duriensis*, *Epipactis helleborine*, *Euphorbia amygdaloides*, *Euphorbia hyberna*, *Helleborus foetidus*, *Hieracium murorum*, *Hyacinthoides non-scripta*, *Ilex aquifolium*, *Lilium martagon*, *Limodorum abortivum*, *Melitis melissophyllum*, *Mercurialis perennis*, *Orchis langei*, *Oxalis acetosella*, *Platanthera bifolia*, *Poa nemoralis*, *Polygonatum odoratum*, *Primula acaulis*, *Quercus robur* subsp. *robur*, *Rosa arvensis*, *Sanicula europaea*, *Sedum forsterianum*, *Solidago virgaurea* subsp. *virgaurea*, *Stachys officinalis*, *Stellaria holostea*, *Taxus baccata*, *Viola riviniana*.

60a. FAGETALIA SYLVATICAE Pawłowski in Pawłowski, Sokołowski & Wallisch 1928

Deciduous and mixed deciduous forests, with acicular leaves, climactical, temporihygrophilous and occasionally edaphoxerophilous, growing on rich neutral soils. Meso to upper orotemperate subhumid to ultrahyperhumid, Atlantic-Central European and Alpine-Caucasian distribution.

Typus: Fagion sylvaticae Luquet 1967.

Characteristic species: *Carex sylvatica*, *Corydalis cava*, *Euphorbia dulcis*, *Galium rotundifolium*, *Lysimachia nemorum*, *Melica uniflora*, *Moehringia trinervia*, *Monotropa hypopitys*, *Neottia nidus-avis*, *Ornithogalum pyrenaicum*, *Potentilla sterilis*, *Prunus avium*, *Veronica montana*.

60.1. *Tilio platyphylli-Acerion pseudoplatani* Klika 1955

Deciduous mesoforests of *Tilia platyphyllos*, *Acer platanoides* or *Ulmus glabra*, growing on stony ravines, torrents and in the bottom of shady canyons, on wet and rich soils often covered by big boulders and subjected to a long lasting windy winter and snow avalanches. In supratemperate humid to hyperhumid Orocantabrian, Pyrenean and Alpine territories.

Typus: Scolopendrio-Fraxinetum excelsioris Schwickerath 1938.

Characteristic species: *Acer platanoides*, *Stachys sylvatica*, *Ulmus glabra*.

60.1.1. *Fraxino angustifoliae-Ulmetum glabrae* Monteiro-Henriques, J.C. Costa & A. Bellu Braun-Blanquetia 46: 325, 2011

60.2. *Pulmonario longifoliae-Quercion roboris* Rivas-Martínez & Izco 2002

Deciduous meso to macroforests of *Quercus robur*, *Quercus pubescens* or *Fraxinus excelsior*, growing on silt or clayey rich mesic soils with a mollic or umbric A horizon. Thermo to supratemperate upper subhumid to lower hyperhumid, Cantabrian-Atlantic, Orocantabrian and Cévennean-Pyrenean distribution.

Typus: Crataego laevigatae-Quercetum roboris Rivas-Martínez & Loidi 1988.

Characteristic species: *Dryopteris aemula*, *Epipactis phyllanthes*, *Hypericum androsaemum*, *Narcissus cyclamineus*, *Phyllitis scolopendrium*, *Pulmonaria longifolia*, *Quercus x andegavensis*, *Quercus x coutinhoi*.

60.2.1. *Hyperico androsaemi-Quercetum roboris* Honrado, Rocha, P. Alves & B. Caldas in Honrado, P. Alves, Nepomuceno & B. Caldas in *Silva Lusit.* 10(2): 249-250, 2002

60b. *QUERCETALIA ROBORIS* Tüxen 1931

Deciduous climactic siliceous acidophilous or neutral-acidophilous meso to macroforests, on poor sandy or loamy soils. Thermo to lower orotemperate and meso to supramediterranean subhumid to hyperhumid, in Atlantic-Central European Alpine-Caucasian and West Iberian territories.

Typus: Quercion roboris Malcuit 1929.

Characteristic species: *Arenaria montana*, *Avenella flexuosa* subsp. *flexuosa*, *Blechnum spicant*, *Ceratocarpus claviculata* subsp. *claviculata*, *Euphorbia angulata*, *Hedera hibernica*, *Hieracium lachenalii*, *Hieracium laevigatum*, *Hieracium maculatum*, *Hieracium sabaudum*, *Hieracium umbellatum*, *Holcus mollis*, *Hypericum pulchrum*, *Lathyrus linifolius*, *Lonicera periclymenum* subsp. *periclymenum*, *Luzula forsteri* subsp. *forsteri*, *Luzula henriquesii*, *Saxifraga spathularis*, *Teucrium scorodonia* subsp. *scorodonia*, *Vaccinium myrtillus*, *Veronica micrantha*, *Veronica officinalis*.

60.3. *Quercion pyrenaicae* Rivas-Goday ex Rivas-Martínez 1964

[*Quercion roboris-broteroanae* Br.-Bl., P. Silva, Rozeira & Fontes in P. Silva, Rozeira & Fontes 1950 (art.3b); *Quercion occidentale* Br.-Bl., P. Silva & Rozeira 1956 (art.34); *Quercion robori-pyrenaicae* (Br.-Bl., P. Silva & Rozeira 1956) Rivas-Martínez 1975]

Forests of *Quercus robur* and *Quercus pyrenaica*, on soils with an acidophilous umbric A horizon. Thermo to supratemperate meso to supramediterranean subhumid to hyperhumid hyperoceanic to semicontinental, distributed by the Cantabrian-Atlantic, Orocantabrian, Mediterranean West Iberian territories and Maghrebi mountains.

Typus: Luzulo forsteri-Quercetum pyrenaicae Rivas-Martínez 1963.

Characteristic species: *Genista falcata*, *Laserpitium thalictrifolium*, *Physospermum cornubiense*, *Quercus pyrenaica*, *Quercus x neomairei* (*Q. broteroi* x *Q. pyrenaica*).

60.3a *Quercenion pyrenaicae*

Acidophilous or neutral-acidophilous forests of *Quercus pyrenaica*, meso-supramediterranean or supratemperate (submediterranean) subhumid to hyperhumid euoceanic to semicontinental, Mediterranean West Iberian and Oroiberian.

Typus: Luzulo forsteri-Quercetum pyrenaicae Rivas-Martínez 1963.

Characteristic species: *Allium massaessylum*, *Leuzea rhapsodicoides*, *Ranunculus ollissiponensis* subsp. *carpetanus*.

60.3.1. *Arbuto unedonis-Quercetum pyrenaicae* (Rivas Goday in Rivas Goday, Esteve, Galiano, Rigual & Rivas-Martínez 1960) Rivas-Martínez 1987

60.3.2. *Arisaro simorrhini-Quercetum pyrenaicae* Pinto-Gomes, P. Ferreira, Aguiar, Lousã, J.C. Costa, Ladero & Rivas-Martínez in Pinto-Gomes, P. Ferreira & Meireles 2007 corr. Pinto-Gomes & J.C. Costa hoc loco [Arisaro vulgare-*Quercetum pyrenaicae* Pinto-Gomes, P. Ferreira, Aguiar, Lousã, J.C. Costa, Ladero & Rivas-Martínez in Pinto-Gomes, P. Ferreira & Meireles in *Lazaroa* 28: 72, 2007]

60.3.3. *Genisto falcatae-Quercetum pyrenaicae* Penas & T.E. Díaz 2002

60.3.4. *Holco mollis-Quercetum pyrenaicae* Br.-Bl., P. Silva & Rozeira 1955 (fig.54, page 114, 75, page 118)

60.3.5. *Pyro bourgeanae-Quercetum pyrenaicae* Ladero, Amor, M.T. Santos, M.E. Sanchez & Ferro 2004 corr. Ladero in *Itinera Geobot.* 18(1): 382, 2011 (fig. 76, page 118) [*Pyro cordatae-Quercetum pyrenaicae* Ladero, Amor, M.T. Santos, M.E. Sanchez & Ferro in *Quercetea* 4: 7, 2004]

60.3b. *Quercenion robori-pyrenaicae* (Br.-Bl., P. Silva & Rozeira 1955) Rivas-Martínez 1975

Acidophilous forests of *Quercus robur* and *Quercus pyrenaica*, infra to supratemperate subhumid to ultrahyperhumid barely hyperoceanic to euoceanic, Cantabrian-Atlantic and Orocantabrian.

Typus: Vaccinio myrtilli-Quercetum roboris P. Silva, Rozeira & Fontes 1950 corr. Br.-Bl., P. Silva & Rozeira 1955 (60.3.7).

Characteristic species: *Anemone trifolia* subsp. *albida*, *Galium belizianum*, *Quercus robur* subsp. *broteroana*, *Quercus x andegavensis* nothosubsp. *henriquesii* (*Q. robur* subsp. *broteroana* x *Q. pyrenaica*).

60.3.6. *Rusco aculeati-Quercetum roboris* Br.-Bl., P. Silva & Rozeira 1955 em. Amigo, Izco, J. Guitián & Romero 1998

60.3.7. *Vaccinio myrtilli-Quercetum roboris* P. Silva, Rozeira & Fontes 1950 corr. Br.-Bl., P. Silva & Rozeira 1955 [Myrtillo-*Quercetum roboris* P. Silva, Rozeira & Fontes 1950]

60.3.8. *Viburno tini-Quercetum broteroanae* (Br.-Bl., P. Silva & Rozeira 1955) J.C. Costa, Capelo, Honrado, Aguiar & Lousã 2002 corr. J.C. Costa & Monteiro-Henriques hoc loco [*Viburno tini-Quercetum roboris* (Br.-Bl., P. Silva & Rozeira 1955) J.C. Costa, Capelo, Honrado, Aguiar & Lousã 2002 (fig. 77, page 119)]

60c. *QUERCETALIA PUBESCENTI-PETRAEAE* Klika 1933

Deciduous climactic or edaphoxerophilous meso to macroforests of *Quercus* spp., *Acer* spp., *Fraxinus* spp., *Pinus* spp. or *Abies* spp., on sandy or siliceous dolomitic limestone substrates rich in bases, usually with a water deficit during the summer. In thermo to supra-

temperate dry to subhumid and meso to supramediterranean subhumid to hyperhumid euoceanic to subcontinental bioclimate, in Cévennean-Pyrenean, Alpine, Atlantic-Central European, Apennine-Balkan, Carpetan-Leonese, Baetic, Mediterranean Central Iberian, Balearic-Catalan-Provençal, Italian-Tyrrhenian, Adriatic and Greek-Aegean territories.

Typus: Quercion pubescenti-petraeae Br.-Bl. 1932 nummut.

Characteristic species: *Acer monspessulanum*, *Hypericum montanum*, *Lathyrus niger*, *Sorbus aria*, *Sorbus latifolia*, *Sorbus torminalis*, *Viola hirta*.

60.4. *Aceri granatensis-Quercion fagineae* (Rivas Goday, Rigual & Rivas-Martínez in Rivas Goday, Borja, Esteve, Galiano, Rigual & Rivas-Martínez 1960) Rivas-Martínez 1987

Climactic deciduous or marcescent micro to mesoforests of *Quercus faginea* subsp. *faginea*, *Quercus faginea* subsp. *alpestris*, *Acer granatensis* and *Acer monspessulanum*, on rich soils and clays, in thermo to supramediterranean subhumid to humid euoceanic to semicontinental bioclimate, with Mediterranean Central Iberian, Baetic, Balearic-Catalan-Provençal and Carpetan-Leonese distribution.

Typus: Sileno melliferae-Quercetum fagineae Rivas Goday & Borja in Rivas Goday, Borja, Esteve, Galiano, Rigual & Rivas-Martínez 1960 corr. Rivas-Martínez, T.E. Díaz, Fernández-González, Izco, Loidi, Lousã & Penas 2002.

Characteristic species: *Epipactis tremolsii*, *Quercus faginea* subsp. *alpestris*, *Quercus faginea* subsp. *faginea*, *Quercus x coutinhoi* nothosubsp. *duriensis*.

60.4.1. *Fraxino angustifoliae-Aceretum monspessulani* Monteiro-Henriques, J.C. Costa, A. Bellu & Aguiar ass. nova hoc loco

60.4.2. *Hedero hibernicae-Quercetum fagineae* Monteiro-Henriques, J.C. Costa, A. Bellu & Aguiar ass. nova hoc loco

60d. *BETULO PENDULAE-POPULETALIA TREMULAE* Rivas-Martínez & Costa 2002

Seral, occasionally climactic, micro to mesoforests of rapid growth and softwood, meso to orotemperate humid to ultrahyperhumid, thermo to mesoboreal humid to hyperhumid, upper mesomediterranean to lower inframediterranean, Eurosiberian and Mediterranean high mountains.

Typus: Corylo avellanae-Populion tremulae (Br.-Bl. & O. Bolòs 1973) Rivas-Martínez & Costa 1998.

Characteristic species: *Acer pseudoplatanus*, *Corylus avellana*, *Populus tremula*, *Salix caprea*, *Sorbus aucuparia*.

60.5. *Betulion fontqueri-celtibericae* Rivas-Martínez & Costa 2002

Siliceous and acidophilous forests of birch and hazel, which represent the climatophilous or secondary vegetation in Orocantabrian, Cantabrian-Atlantic, Carpetan-Leonese, Oroiberian and Nevadensian territories.

Typus: Luzulo henriquesii-Betuletum celtibericae Rivas-Martínez 1965 nom mut.

Characteristic species: *Betula celtiberica*.

60.5b. *Betulenion fontqueri-celtibericae* Rivas-Martínez & Costa in Itinera Geobot. 18(1): 388, 2011

Climactic and secondary siliceous and acidophilous birch forests, Cantabrian-Atlantic, Carpetan-Leonese and Oroiberian.

Typus: Luzulo henriquesii-Betuletum celtibericae Rivas-Martínez 1965 nom mut.

60.5.1. *Eryngio juresiani-Betuletum celtibericae* Honrado, P. Alves, Pulgar, Ortiz & B. Caldas ass nova hoc loco

60.5.2. *Holco mollis-Betuletum celtibericae* Amigo & M.I. Romero 2002

60.5.3. *Saxifrago spathularis-Betuletum celtibericae* Rivas-Martínez 1981 (fig. 78, page 119)

60.5b. *Laserpitio eliasii-Corylenion avellanae* Rivas-Martínez & Costa in Itinera Geobot. 18(1): 389, 2011

Calcicolous or neutral-alkaline hazel woods, supratemperate humid to hyperhumid, Orocantabrian, Oroiberian and Cantabrian-Atlantic.

Typus: Laserpitio eliasii-Coryletum avellanae Puente, M.J. López, Penas & F. Salegui 2002.

60.5.4. *Omphalodo nitidae-Coryletum avellanae* Amigo, G. Azcárate & Romero 1994

IXc. MADEIRAN POTENTIAL AND NATURAL VEGETATION

61. *KLEINIO NERIIFOLIAE-EUPHORBIETEA CANARIENSIS* (Rivas Goday & Esteve 1965) Santos 1976

Canarian succulent *Euphorbia* spp. and scrub climactic desertic Mediterranean and related edaphoxerophilous permanent xeric Mediterranean communities, infra and lower thermomediterranean arid and lower semiarid, developed on lava fields and leptosols with andic properties.

Typus: Kleinio neriifoliae-Euphorbietalia canariensis Rivas Goday & Esteve 1965) Santos 1976.

Characteristic species: *Asparagus nesiotetes* subsp. *nesiotetes*, *Rubia fruticosa* subsp. *melanocarpa* (61a).

61a. *KLEINIO NERIIFOLIAE-EUPHORBIETALIA CANARIENSIS* (Rivas Goday & Esteve 1965) Santos 1976

Single order.

Typus: Kleinio neriifoliae-Euphorbion canariensis (Rivas Goday & Esteve 1965) Santos 1976.

61.1. *Kleinio neriifoliae-Euphorbion canariensis* (Rivas Goday & Esteve 1965) Santos 1976

Nano-microphanerophytic climatophilous succulent and edaphoxerophilous vegetation, infra to thermomediterranean hyperarid to semiarid, Canarian.

Typus: Aeonio percarnei-Euphorbietum canariensis (Rivas Goday & Esteve 1965) Sunding 1972.

61.1b. *Aeonio-Euphorbenion canariensis* (Rivas Goday & Esteve 1965) Santos & Rivas-Martínez in Itinera Geobot. 18(1): 395, 2011

Succulent climatophilous or edaphoxerophilous communities, infra to thermomediterranean arid to semi-arid, with Canarian distribution, reaching the Selvagens Islands.

Typus: *Aeonio percarnei-Euphorbietum canariensis* (Rivas Goday & Esteve 1965) Sunding 1972.

Characteristic species: *Argyranthemum thalassophilum*, *Euphorbia desfoliata*, *Periploca laevigata*, *Scilla madeirensis* var. *melliodora*.

61.1.1. *Euphorbietum anachoretiae* Pérez Paz & Acebes 1983 nom. inval. (art. 3b, art. 5)

62. RHAMNO CRENULATAE-OLEETEA CERASIFORMIS Santos 1983 ex Rivas-Martínez 1987 nom. inv. [Oleo-Rhamnetaea crenulatae Santos 1983 ex Rivas-Martínez 1987]

Microphyllous and sclerophyllous microforests of *Olea* spp. and *Juniper* spp. (sometimes also succulent *Euphorbia* spp. and *Phoenix canariensis*), or dense secondary shrubby or mantle forests of *Hypericum canariensis*, and seral open dwarf-scrub of *Cistus* spp. and *Micromeria* spp. communities. In infra to mesomediterranean semiarid to dry bioclimate, in the Canarias and Madeira archipelagos.

Typus: *Rhamno crenulatae-Oleetalia cerasiformis* Santos 1983 nom. inv. (62a.)

Characteristic species: *Dracaena draco*, *Rubia fruticosa* subsp. *fruticosa*.

62a. RHAMNO CRENULATAE-OLEETALIA CERASIFORMIS Santos 1983 nom. inv. [Oleo-Rhamnetaea crenulatae Santos 1983]

Canarian and Madeiran climactic microforests, permanent and related communities.

Typus: *Mayteno canariensis-Juniperion canariensis* Santos & F. Galávan ex Santos 1983 corr. Rivas-Martínez, T.E. Díaz, Fernández González, Izco, Loidi, Lousã & Penas 2002.

Characteristic species: *Asparagus scoparius*, *Bupleurum salicifolium* subsp. *salicifolium*, *Ephedra fragilis* var. *dissoluta* (ter.), *Erysimum bicolor*, *Globularia salicina*, *Hypericum canariense* var. *floribundum*, *Jasminum odoratissimum*, *Juniperus turbinata* subsp. *canariensis*, *Myrtus communis* (ter.), *Tamus edulis*, *Teucrium heterophyllum*.

62.1. Mayteno umbellatae-Oleion maderensis Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 nom. invers. [Oleo maderensis-Maytenion umbellatae Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000]

Sclerophyllous climactic microforests of *Olea maderensis*, and scrubs of *Euphorbia piscatoria* and *Echium* spp., also climactic in rocky crests and slopes of incipient soils (edaphoxerophilous). Infra to thermomediterranean semiarid to lower subhumid, in Madeira, Porto Santo and Desertas.

Typus: *Euphorbietum piscatoriae* Sjögren ex Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 (62.1.1.).

Characteristic species: *Asparagus umbellatus* subsp. *lowei*, *Chamaemeles coriacea*, *Convolvulus massonii*, *Crambe fruticosa*, *Echium nervosum*, *Echium portosanctensis*, *Euphorbia piscatoria*, *Helichrysum melaleucum*, *Jasminum azoricum*, *Maytenus umbellata*, *Olea maderensis*, *Plantago maderensis*, *Prasium medium*, *Scilla madeirensis* var. *madeirensis*, *Sideritis candicans* var. *multiflora*.

62.1.1. *Euphorbietum piscatoriae* Sjögren ex Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 (fig. 79, page 119)

62.1.2. *Gennario diphyllae-Euphorbietum piscatoriae* Jardim, Capelo, Sequeira, Aguiar & J.C. Costa ass. nova hoc loco

62.1.3. *Mayteno umbellatae-Oleetum maderensis* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 nom. invers. (fig. 79, page 119) [Oleo maderensis-Maytenetum umbellatae Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000]

62.1.4. *Myrto communis-Hypericetum canariensis* Capelo, J.C. Costa, Jardim, Sequeira & Rivas-Martínez in Silva Lusit. 11(2): 256, 2003

62.1.5. *Siderito multiflorae-Echietum portosanctensis* Jardim, Capelo, Sequeira, Aguiar & J.C. Costa ass. nova hoc loco

62.b. MICROMERIO HYSSOPIFOLIAE-CISTETALIA CANARIENSIS Pérez de Paz, Del Arco & Wildpret 1990 corr. Rivas-Martínez in Itinera Geobot. 18(1): 401, 2011 [Cisto monspeliensis-Micromerietalia hyssopifoliae Pérez de Paz, Del Arco & Wildpret 1990]

Seral and pioneer dwarf-scrub communities, that occur on leptosols, crests near the sea and on decapitated stony soils, often resulting from human action, agriculture and fire. In infra to thermomediterranean semiarid to dry bioclimate, Canarian and Madeiran.

Typus: *Micromerio hyssopifoliae-Cistion canariensis* Pérez de Paz, Del Arco & Wildpret 1990 corr. Rivas-Martínez in Itinera Geobot. 18(1): 401, 2011.

Characteristic species: *Carlina salicifolia*.

62.2. Soncho ustulati-Artemision argenteae Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000

Seral infra to thermomediterranean communities on the leptosols of Madeira, Porto Santo and Desertas.

Typus: *Artemisio argenteae-Genistetum tenerae* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 (62.2.1).

Characteristic species: *Artemisia argentea*, *Cheirolophus massonianus*, *Erysimum arbuscula*, *Erysimum maderense*, *Genista tenera*, *Helichrysum monizii*, *Lotus argyroides*, *Lotus macranthus*, *Micromeria varia* subsp. *thymoides* var. *thymoides*, *Phagnalon lowei*.

62.2.1. *Artemisio argenteae-Genistetum tenerae* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000

62.2.2. *Erysimo arbusculae-Artemisietum argenteae* Jardim, Capelo, Sequeira, Aguiar & J.C. Costa in Capelo, J.C. Costa, Jardim, Sequeira & Rivas-Martínez in Silva Lusit. 11(2): 259, 2003

62.2.3. *Loto macranthi-Phagnaletum lowei* Jardim, Capelo, Sequeira, Aguiar & J.C. Costa ass. nova hoc loco

63. POLYCARPAEO NIVEAE-TRAGANETEA MOQUINI Santos ex Rivas-Martínez & Wildpret 2002

Shrubby and dwarf-scrub communities of desertic sand dunes, developed on deep sandy regosols. Inframediterranean arid hyperoceanic and euoceanic bioclimate, with Canarian, Madeiran and West Oceanic Sahara distribution.

Typus: Zygophyllo fontanesii-Polycarpaetalia niveae Santos ex Géhu, Biondi, Géhu-Frank, Hendoux & Mossa 1996 (63a.).

Characteristic species: *Zygophyllum fontanesii*.

63a. ZYGOPHYLLO FONTANESII-POLYCARPAETALIA NIVEAE Santos ex Géhu, Biondi, Géhu-Frank, Hendoux & Mossa 1996

Single order.

Typus: Ononido ramosissimae-Polycarpaetion niveae Biondi, Alegreja, Taffetani & Wildpret 1994.

63.1. Traganion moquini Sunding 1972

Tall and dwarf-scrubs stable desertic communities of coastal and inland sand dunes, in hyperoceanic and euoceanic inframediterranean. In Canarias and West Oceanic Sahara, reaching the Selvagens islands.

Typus: Traganetum moquini Sunding 1972.

Characteristic species: *Limonium papillatum* var. *callibotryum*, *Lobularia canariensis* subsp. *rosulaventi*, *Lotus glaucus* subsp. *salvagensis*, *Lotus lanцерottensis*.

63.1.1. *Suaedo verae-Limonietum callibotryi* Pérez de Paz & Acebes 1985

63.2. Polycarpaeo niveae-Euphorbion paraliae Rivas-Martínez & Wildpret 2002

Dwarf-scrubs and perennial grasses unstable communities, in mobile littoral sand dunes with marine salt-spray, in Canarias, Selvagens and Porto Santo.

Typus: Euphorbio paraliae-Cyperetum capitati Sunding 1972.

Characteristic species: *Calystegia sepium* (terr.), *Elytrigia juncea* subsp. *juncea* (terr.), *Euphorbia paralias* (terr.), *Polygonum maritimum* (terr.).

63.2.1. *Loto salvagensis-Elytrigietum juncea* Pérez de Paz & Acebes ex J.C. Costa, Jardim, Capelo, Sequeira, & Lousã ass nova hoc loco

63.2.2. *Polygono maritimi-Euphorbietum paraliae* Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito Santo & Lousã in Silva Lusit. 11 (1): 118, 2003

63.3. Euphorbio paraliae-Lotion floridi Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito Santo & Lousã 2003 corr. Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito Santo & Lousã hoc loco

[*Euphorbio paraliae-Lotion glauci* Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito Santo & Lousã in Silva Lusit. 11 (1): 118, 2003]

Dwarf-scrubs stable communities of coastal and inland sand dunes, hyperoceanic inframediterranean semiarid to dry in Porto Santo and Madeira islands.

Typus: Euphorbio paraliae-Lotetum glauci Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito Santo & Lousã in Silva Lusit. 11 (1): 117, 2003 corr. *Euphorbio paraliae-Lotetum floridi* Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito Santo & Lousã hoc loco (63.3.1).

Characteristic species: *Crepis divaricata*, *Lotus glaucus* subsp. *glaucus*, *Lotus glaucus* subsp. *floridus*.

63.3.1. *Euphorbio paraliae-Lotetum floridi* Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito Santo & Lousã 2003 corr. Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito Santo & Lousã hoc loco

[*Euphorbio paraliae-Lotetum glauci* Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito Santo & Lousã in Silva Lusit. 11 (1): 117, 2003]

63.3.2. *Polygono maritimae-Lotetum glauci* J.C. Costa, Capelo, Jardim & Sequeira ass. nova hoc loco

64. PRUNO HIXAE-LAURETEA NOVOCANARIENSIS Oberdorfer 1965 corr. Rivas-Martínez, T.E. Díaz, Fernández-González, Izco, Loidi, Lousã & Penas 2002

Endemic mesoforests of evergreen, flat, broad, leathery and waxy leaves, of Canarias and Madeira (*laurisilva*) and associated seral vegetation, riparian willows and their thorny communities. On deep soils (cambisols or andosols) with “mull” humus. In hyperoceanic infra to supramediterranean and meso to supratemperate submediterranean dry to hyperhumid bioclimate. Constitute a paleo-tropical and paleo-Mediterranean relict forest, dating at least from the Miocene.

Typus: Andryalo pinnatifidae-Ericetalia canariensis Oberdorfer 1965 corr. Rivas-Martínez in Itinera Geobot. 18(1): 403, 2011 (64a.).

Characteristic species: *Cedronella canariensis*, *Erica canariensis*, *Hypericum glandulosum*, *Hypericum grandifolium*, *Ilex canariensis*, *Myrica faya*, *Phyllis nobla*, *Rhamnus glandulosa*, *Smilax canariensis*.

Differential species: *Asplenium onopteris*, *Athyrium filix-femina*, *Blechnum spicant*, *Carex peregrina*, *Culcita macrocarpa*, *Diplazium caudatum*, *Dryopteris aemula*, *Dryopteris affinis*, *Gennaria diphylla*, *Neotinea maculata*, *Polystichum setiferum*, *Rubia agostinhoi*, *Stegnoogramma pozoi*, *Taxus baccata*, *Viola riviniana*.

64a. ANDRYALO PINNATIFIDAE-ERICETALIA CANARIENSIS Oberdorfer 1965 corr. Rivas-Martínez Itinera Geobot. 18(1): 403, 2011

Dense shrubby communities of *Erica platycodon*, *E. canariensis*, *E. madericola*, *Myrica faya*, *Ilex canariensis* and *Picconia excelsa*, seral or mantle of *Pruno-Lauretalia novocanariensis*. Sometimes constituting a permanent biotopes of thin soils, edaphoxerophilous.

Typus: Myrico fayae-Ericion canariensis Oberdorfer 1965 corr. Rivas-Martínez Itinera Geobot. 18(1): 403, 2011 (64.1.).

64.1. *Myrico fayae-Ericion canariensis* Oberdorfer 1965 corr. Rivas-Martínez Itinera Geobot. 18(1): 403, 2011

[*Myrico fayae-Ericion arboreae* Oberdorfer 1965]

Dense shrubby communities of *Erica canariensis* or *Myrica faya*, infra to mesomediterranean and supra-temperate, seral of *Pruno-Lauretalia novocanariensis*, Canarian and Madeiran.

Typus: *Myrico fayae-Ericetum canariensis* Oberdorfer 1965 corr. Rivas-Martínez Itinera Geobot. 18(1): 403, 2011.

Characteristic species: *Marcetella maderensis*.

64.1.1. *Globulario salicinae-Ericetum canariensis* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 corr. Capelo, J.C. Costa, Lousã, Jardim, Sequeira & Rivas-Martínez hoc loco (fig. 80, page 120)
[*Globulario salicinae-Ericetum arboreae* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000]

64.1.2. *Pteridio aquilini-Ericetum maderincolae* J.C. Costa, Capelo, Jardim, Sequeira & Rivas-Martínez ass. nova hoc loco
[Community of *Erica maderincola* and *Erica arborea* J.C. Costa, Capelo, Jardim, Sequeira, Espírito Santo, Lousã, Fontinha, Aguiar & Rivas-Martínez 2004]

64.2. *Bystropogono punctati-Telinion maderensis* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000

Madeiran meso to supratemperate substitution scrubby communities of *Teline maderensis* or permanent rupicolous *Erica maderensis* communities.

Typus: *Bystropogono punctati-Telinetum maderensis* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 (64.2.1.).

Characteristic species: *Argyranthemum pinnatifidum* subsp. *montanum*, *Argyranthemum pinnatifidum* subsp. *pinnatifidum*, *Bunium brevifolium*, *Bystropogon punctatus*, *Echium candicans*, *Erica maderensis*, *Plantago arborescens* subsp. *costae*, *Plantago malato-belizii*, *Sideritis candicans* var. *candicans*, *Teline maderensis* var. *maderensis*.

64.2.1. *Bystropogono punctati-Telinetum maderensis* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000

64.2.2. *Argyranthemum montani-Ericetum maderensis* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 (fig. 81, page 120)

64b. *PRUNO HIXAE-LAURETALIA NOVOCANARIENSIS* Oberdorfer ex Rivas-Martínez, Arnáiz, Barreno & Crespo 1977 corr. Rivas-Martínez, T.E. Díaz, Fernández-González, Izco, Loidi, Lousã & Penas 2002

Natural potential vegetation, hyperoceanic infra to supramediterranean and meso to supratemperate (submediterranean) dry to ultra hyperhumid, Canarian and Madeiran.

Typus: *Ixantho viscosae-Laurion novocanariensis* Oberdorfer ex Santos in Rivas-Martínez, Arnáiz, Barreno & Crespo 1977 corr. Rivas-Martínez, T.E. Díaz, Fernández-González, Izco, Loidi, Lousã & Penas 2002.

Characteristic species: *Heberdenia excelsa*, *Laurus novocanariensis*, *Ocotea foetens*, *Persea indica*, *Prunus hixa*, *Pteris incompleta*.

64.3. *Sibthorpio peregrinae-Clethron arboreae* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000

Thermo-mesotemperate (submediterranean) and mesomediterranean humid to hyperhumid, Madeiran mesoforests.

Typus: *Clethro arboreae-Ocoteetum foetentis* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 (64.3.1.).

Characteristic species: *Arachniodes webbium*, *Berberis maderensis*, *Carex lowei*, *Cirsium latifolium*, *Clethra arborea*, *Dryopteris aitoniana*, *Dryopteris x furadensis*, *Dryopteris maderensis*, *Erica platycodon* subsp. *maderincola*, *Festuca donax*, *Goodyera macrophylla*, *Hedera maderensis* subsp. *maderensis*, *Ilex perado*, *Lonicera etrusca* var. *glabrata*, *Luzula seubertii*, *Normania triphylla*, *Pittosporum coriaceum*, *Polystichum drepanum*, *Rosa mandonii*, *Rubus grandifolius*, *Ruscus streptophyllus*, *Sambucus lanceolata*, *Sibthorpio peregrina*, *Teucrium abutiloides*, *Teucrium betonicum*, *Vaccinium padifolium*.

64.3.1. *Clethro arboreae-Ocoteetum foetentis* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 (fig. 82, page 120)

64.3.2. *Diplazio caudati-Perseetum indiciae* Capelo, J.C. Costa, Jardim, Sequeira, Aguiar & Lousã in Silva Lusit. 11 (1): 114, 2003

64.3.3. *Rhamno glandulosi-Sambucetum lanceolati* Capelo, J.C. Costa, Jardim, Sequeira, Aguiar & Lousã in Silva Lusit. 11 (1): 114, 2003

64.3.4. *Vaccinio padifolii-Ericetum maderincolae* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 (fig. 83, page 120)

64.4. *Visneo mocanerae-Apollonion barbujanae* Rivas-Martínez in Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000

Canarian and Madeiran micro-mesoforests, infra to mesomediterranean dry to humid.

Typus: *Visneo mocanerae-Arbutetum canariensis* Rivas-Martínez, Wildpret, Del Arco, O. Rodríguez, Pérez de Paz, García Gallo, Acebes, T.E. Díaz & Fernández-González 1993.

Characteristic species: *Apollonias barbujana*, *Arum italicum* subsp. *canariensis*, *Carduus squarrosus*, *Picconia excelsa*, *Semele androgyna*, *Sideroxylon mirmulans*, *Smilax pendulina*, *Visnea mocanera*.

64.4.1. *Helichryso melaleuci-Sideroxyletum mirmulans* Capelo, J.C. Costa, Jardim, Sequeira & Rivas-Martínez in Silva Lusit. 11(2): 257, 2003 (fig. 84, page 121)

64.4.2. *Semele androgynae-Apollonietum barbujanae* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 (fig. 85, page 121)

64.5. *Polysticho falcinelli-Ericion canariensis* Rivas-Martínez, Capelo, J.C. Costa, Lousã, Fontinha, Jardim & Sequeira 2002 corr. Rivas-Martínez, Capelo, J.C. Costa, Lousã, Jardim & Sequeira corr. hoc loco

[*Polysticho falcinelli-Ericion arboreae* Rivas-Martínez, Capelo, J.C. Costa, Lousã, Fontinha, Jardim & Sequeira 2002]

Upper mesotemperate to supratemperate (submediterranean), hyperhumid to ultra hyperhumid Madeiran microforests.

Typus: Polysticho falcinelli-Ericetum arboreae Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 corr. *Polysticho falcinelli-Ericetum canariensis* Capelo, J.C. Costa, Lousã, Jardim, Sequeira & Rivas-Martínez corr. hoc loco (64.5.1).

Characteristic species: *Juniperus cedrus* subsp. *maderensis*, *Polystichum falcinellum*, *Polystichum x maderensis*, *Ranunculus cortusifolius* var. *minor*, *Sorbus maderensis*.

64.5.1. *Polysticho falcinelli-Ericetum canariensis* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 corr. Capelo, J.C. Costa, Lousã, Jardim, Sequeira & Rivas-Martínez corr. hoc loco (fig. 86, page 121)

[*Polysticho falcinelli-Ericetum arboreae* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000]

64.6. *Euphorbion melliferae* Capelo, J.C. Costa, Jardim, Sequeira, Aguiar & Lousã in Silva Lusit. 11(1): 112, 2003

Microphyllous caulirosette communities with woody habit and large leaves, proper interrupt the forest canopy.

Typus: Isoplexido sceptri-Euphorbietum melliferae Capelo, J.C. Costa, Jardim, Sequeira, Aguiar & Lousã in Silva Lusit. 11(1): 112, 2003 (64.6.1).

Characteristic species: *Euphorbia mellifera*, *Isoplexis sceptrum*, *Melanoselinum decipiens*, *Musschia wollastonii*, *Sonchus fruticosus*, *Sonchus pinnatus*.

64.6.1. *Isoplexido sceptri-Euphorbietum melliferae* Capelo, J.C. Costa, Jardim, Sequeira, Aguiar & Lousã in Silva Lusit. 11(1): 112, 2003 (fig. 87, page 121)

64.6.2. *Sonchetum pinnati* Capelo, J.C. Costa, Jardim, Sequeira & Rivas-Martínez in Silva Lusit. 11(2): 262, 2003

64c. *RUBO BOLLEI-SALICETALIA CANARIENSIS* Rivas-Martínez in Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000

Canarian and Madeiran hygrophytic or riparian communities of willows and thornbushes.

Typus: Rubio periclymeni-Rubetum ulmifolii Oberdorfer 1965.

Characteristic species: *Urtica morifolia*.

64.7. *Rubio periclymeni-Rubion ulmifolii* (Oberdorfer 1965) Rivas-Martínez, Wildpret, Del Arco, O. Rodríguez, Pérez de Paz, García Gallo, Acebes, T.E. Díaz & Fernández-González 1993

Dense thornbushes and liana humid mantle, Canarian and Madeiran.

Typus: Rubio periclymeni-Rubetum ulmifolii Oberdorfer 1965.

Characteristic species: *Rubus bollei*.

64.7.1. *Rubio agostinhoi-Rubetum bollei* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000

64.8. *Salicion canariensis* Rivas-Martínez, Wildpret, Del Arco, O. Rodríguez, Pérez de Paz, García Gallo, Acebes, T.E. Díaz & Fernández-González ex Rivas-Martínez, Fernández-González & Loidi 1999

Canarian and Madeiran microforests of riparian deciduous willows.

Typus: Rubo ulmifolii-Salicetum canariensis J.C. Rodríguez, Del Arco & Wildpret 1986.

Characteristic species: *Salix canariense*, *Scrophularia hirta*, *Scrophularia racemosa*.

64.8.1. *Scrophulario hirtae-Salicetum canariensis* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000

Conclusions

Done this catalogue, we can consider that the Portuguese vegetation is relatively well studied. It is a very diverse and rich vegetation, accounted for a total of 827 associations (and 4 communities), 244 alliances, 116 orders, 64 phytosociological classes, 58 suballiances, 2 suborders and 4 subclasses. Most syntaxa are Mediterranean, due to the fact that the Portuguese territory is in large part, situated in the Mediterranean Region, having a Mediterranean macrobioclimate (Costa et al. 1999, Rivas-Martínez et al. 2002, 2005).

The Azores archipelago has a mostly temperate macrobioclimate (Rivas-Martínez et al. 2002) and possesses two endemic classes: *Lauro azoricae-Juniperetea brevifoliae* and *Tolpido azoricae-Holcetea rigidi*.

Concerning Madeira, in the last decade there was a very significant advance in the knowledge of its vegetation. In Portuguese territory, the classes *Pruno hixae-Lauretea novocanariensis*, *Rhamno crenulatae-Oleetea cerasiformis*, *Greenovio-Aeonietea* are only signalled to this archipelago.

The Ilhas Selvagens (Savage Islands), which are part of the Autonomous Region of Madeira, are still poorly studied (Pérez de Paz & Acebes 1983; Acebes & Pérez de Paz 1985). Biogeographically they constitute a sector of the Eastern Canarian Subprovince (Canarian Province), having a Mediterranean desertic oceanic bioclimate. It is the only Portuguese territory where the class *Kleinio-Euphorbietea canariensis* (with one association invalidly published) has been reported, as well as the alliances *Frankenio-Astydamion latifoliae* of *Crithmo-Limonietea* (with one association) and *Traganion moquini* of *Polycarpaeo niveae-Traganetea moquini* (with two associations).

ANNEX I

SYNTAXONOMIC ANNEX

Adenocarpus anisochili-Ulicetum latebracteati (J.C. Costa, Capelo & Lousã in J.C. Costa, Capelo, Lousã, Antunes, Aguiar, Izco & Ladero 2000) J.C. Costa, Neto & T. Vasconcelos st. nov. hoc loco (54.4.2.)

(*Ulici europaei-Cytisium striati*, *Cytisetalia scopario-striati*, *Cytisetea scopario-striati*)

Basion.: *Adenocarpus anisochili-Cytisetum striati* J.C. Costa, Capelo & Lousã in J.C. Costa, Capelo, Lousã, Antunes, Aguiar, Izco & Ladero 2000 *ulicetosum latebracteati* J.C. Costa, Capelo & Lousã 2000.

[*Ulici latebracteati-Cytisetum striati* sensu Pinto-Gomes, Cano-Ortiz, Quinto-Canas, Vila-Viçosa & Martínez-Lombardo 2012 (nom inval., art. 3b) non Rivas-Martínez ex J.C. Costa, Izco, Lousã, Aguiar & Capelo in J.C. Costa, Capelo, Lousã, Antunes, Aguiar, Izco & Ladero 2000].

Diagnosis: Mesomediterranean humid subhyperoceanic nanophanerophytic community, formed by *Ulex latebracteatus*, *Cytisium striatum*, *Adenocarpus anisochilus*, *Ulex jussiaei* x *Ulex latebracteatus*, *Pteridium aquilinum*, *Erica arborea*, etc., on sandy soils derived from syenites, in western and northern slopes of Sintra Mountain. Subseral of *Arisaro simorrhini-Quercetum pyrenaicae* (see Costa et al. 2000).

Holotypus: relevé no. 6 table 4 in Costa et al. (2000), p. 126: Peninha, Serra de Sintra (Sintra), 380 m, 50 m²: Characteristic species: 3 *Cytisium striatum*, 3 *Ulex latebracteatus*, + *Adenocarpus anisochilus*, 1 *Pteridium aquilinum*, 1 *Ulex jussiaei* x *Ulex latebracteatus*; companion species: 2 *Rubus ulmifolius*, 1 *Calluna vulgaris*,

1 *Ulex jussiaei*, 1 *Erica scoparia*, 1 *Cistus crispus*, 1 *Coincya cintrana*, + *Daphne gnidium*, + *Holcus lanatus*, + *Ulex minor*, + *Teucrium scorodonia*, + *Prunella vulgaris*.

[J.C. COSTA, NETO & T. VASCONCELOS]

Aichrysetum dumosi J.C. Costa, Capelo, Jardim & Sequeira ass. nova hoc loco (27.1.1.)

(*Greenovio-Aeonietea*, *Soncho-Aeonietalia*, *Aichryson laxi-Monanthon laxiflorae*)

Diagnosis: Mediterranean pluviseasonal-oceanic euhyperoceanic inframediterranean dry association, formed by the small therophyte *Aichryson dumosum*, on basalt gravel in the south side of Madeira Island.

Holotypus: Moledos (Madeira), 350 m, S, 2 m², Characteristic species: 3 *Aichryson dumosum*, + *Aeonium glutinosum*, + *Sedum nudum*; Companion species: 1 *Misopates orontium*, + *Umbilicus rupestris* + *Davallia canariensis*, + *Notholaena subcordata*.

[J.C. COSTA, CAPELO, JARDIM & SEQUEIRA]

Anarrhinetum longipedicellati Monteiro-Henriques, J.C. Costa & Aguiar ass. nova hoc loco (28.4.1.)

(*Phagnalo-Rumicetea indurati*, *Phagnalo saxatilis-Rumicetalia indurati*, *Sesamoidion suffruticosae*)

Diagnosis: Hemicryptophytic community characterized by the Lusitanian endemism *Anarrhinum longipedicellatum* (Table 1, *holotypus* relevé no. 4), on walls or rocky steep slopes derived from schists, in mesotemperate (submediterranean), humid to hyperhumid, semi-hyperoceanic bioclimate. It occurs in an area comprised within Aldeia da Pena, Covas do Rio, Alvarenga and

Table 1

28.4.1. *Anarrhinetum longipedicellati* ass. nova hoc loco

Altitude (1=10 m)	27	37	42	66	67
Orientation	S	W	E	SW	SW
Surface (m ²)	10	10	5	5	5
Nº of species	16	11	6	6	9
Ordinal number	1	2	3	4*	5
Characteristic species					
<i>Anarrhinum longipedicellatum</i>	2	2	3	3	3
<i>Sesamoides purpurascens</i>	.	.	1	+	1
<i>Sedum hirsutum</i>	.	1	+	+	.
<i>Coincya pseudoerucastrum</i> subsp. <i>puberula</i>	.	.	.	1	.
<i>Conopodium majus</i> subsp. <i>marizianum</i>	.	.	.	.	+
Companion species					
<i>Sanguisorba verrucosa</i>	+	+	+	.	+
<i>Andryala integrifolia</i>	+	.	+	.	+
<i>Sedum anglicum</i>	.	2	.	1	.
<i>Pseudarrhenatherum longifolium</i>	.	1	1	.	.
<i>Hypochoeris radicata</i>	.	1	.	+	.
<i>Jasione montana</i>	.	1	.	.	+
<i>Lotus carpetanus</i>	1	+	.	.	.
<i>Hypericum linarifolium</i>	.	+	.	.	+

Other companion species: 2 *Pulicaria odora*, 1 *Thymus caespititius*, + *Carlina corymbosa*, + *Centranthus calcitrapae*, + *Filago pyramidata*, + *Leontodon longirostris*, + *Lotus hispidus*, + *Micropyrum tenellum*, + *Sedum pruinastrum*, + *Tolpis barbata*, + *Tuberaria guttata*, + *Vicia angustifolia* in 1; + *Clinopodium arundanum*, + *Umbilicus heylandianus* in 2; + *Anthoxanthum amarum*, + *Ranunculus bupleuroides* in 5

Localities: 1: between Deilão and Covas do Rio (S. Pedro do Sul), 2: Ponte de Cabril (Castro Daire), 3: Parada de Ester (Castro Daire); 4* (*holotypus*), 5: between Sete Fontes and Covas do Rio (S. Pedro do Sul)

Table 2
45.2.1. *Arrhenathero bulbosi-Armerietum beiranae* ass. nova hoc loco

Altitude (1=10 m)	99	96	96	102	80	79	80	84
Orientation	-	SW	N	-	-	-	-	-
Surface (m ²)	4	6	6	6	16	15	16	8
N° of species	16	17	17	14	22	15	15	18
Ordinal number	1	2	3*	4	5	6	7	8
Characteristic species								
<i>Arrhenatherum bulbosum</i>	1	3	2	1	5	2	4	3
<i>Armeria beirana</i>	1	2	4	3	3	4	3	1
<i>Centaurea herminii</i>	+	1	1	.	+	+	+	+
<i>Rumex angiocarpus</i>	+	1	1	+	1	.	1	.
<i>Celtica gigantea</i>	4	2	1	2	1	.	.	.
<i>Agrostis castellana</i>	.	.	.	3	2	3	2	2
<i>Dactylis lusitanica</i>	.	.	.	2	.	2	1	1
<i>Hypochoeris radicata</i>	.	1	.	.	+	+	1	.
<i>Conopodium marizianum</i>	.	.	+	.	.	.	+	+
<i>Agrostis truncatula</i>	.	.	.	3	.	.	.	+
<i>Avenula lodunensis</i>	.	.	.	4	.	.	.	.
<i>Spergularia capillacea</i>	.	.	.	+	.	.	.	.
<i>Sanguisorba verrucosa</i>	.	.	.	.	.	.	.	+
Companion species								
<i>Jasione montana</i>	.	.	1	.	+	+	+	+
<i>Micropyrum tenellum</i>	.	2	1	.	+	+	.	.
<i>Agrostis duriaei</i>	2	3	2	.	.	.	.	.
<i>Anthoxanthum aristatum</i>	.	.	2	.	+	.	+	.
<i>Hypericum linariifolium</i>	.	.	.	1	.	+	.	+
<i>Cytisus multiflorus</i>	1	.	.	+	+	.	.	.
<i>Vulpia muralis</i>	.	+	1	.	+	.	.	.
<i>Bromus hordeaceus</i>	.	+	+	.	+	.	.	.
<i>Ornithopus perpusillus</i>	.	+	.	.	.	.	+	+
<i>Ornithopus compressus</i>	.	+	+	.	.	.	.	+
<i>Ulex minor</i>	+	.	.	.	+	.	+	.
<i>Vicia angustifolia</i>	.	.	.	.	+	+	+	.
<i>Echium lusitanicum</i>	.	.	.	+	.	+	.	+
<i>Hypochoeris glabra</i>	.	.	2	.	.	.	.	1
<i>Lupinus gredensis</i>	.	.	.	.	1	.	.	+
<i>Hispidella hispanica</i>	+	.	+	.	.	.	.	.
<i>Luzula campestris</i>	+	.	.	.	.	+	.	.
<i>Campanula lusitanica</i>	.	+	+	.	.	.	.	.
<i>Cytisus striatus</i>	.	.	.	.	+	.	+	.
<i>Herniaria scabrida</i>	.	.	.	.	.	+	.	+
<i>Holcus lanatus</i>	.	.	.	.	.	.	+	+

Other companion species: 2 *Ulex latebracteatus*, + *Aira cupaniana*, + *Aira praecox*, + *Bellis perennis*, + *Lotus carpeta-nus*, + *Saxifraga granulata* in 1; 1 *Anthoxanthum odoratum*, 1 *Teesdalia nudicaulis*, + *Chamaemelum mixtum*, + *Erodium cicutarium* in 2; + *Carduus tenuiflorus* in 3; + *Andryala integrifolia*, + *Cynosurus cristatus*, + *Linaria spartea* in 4; 1 *Bromus diandrus*, + *Centranthus calcitrapae*, + *Ceratocarpus claviculata* subsp. *picta*, + *Corynephorus canescens*, + *Spergularia arvensis* in 5; 1 *Vulpia myuros*, + *Crepis capillaris* in 6; + *Carduus carpetanus* in 8.

Localities: 1: Between Fazamões and Reconcos bridge (Lamego), 2, 3* (*holotypus*): Bigorne (Lamego), 4: Between Carvalhosa and Portas de Montemuro (Castro Daire), 5, 6: Between Peva and Soutosa (Moimenta da Beira), 7: Between Vila Cova à Coelheira and Vila Nova de Paiva (Vila Nova de Paiva), 8: Between Lamosa and Carregal (Sernancelhe).

Parada de Ester of the southern part of the Coastal Mi-niense Superdistrict. This community occurs on steep slopes associated to the deep hydrographical system in the Ordovician, Silurian and Carboniferous metasediments and in the pre-Ordovician metasediments of the Douro Group. Its distribution area has been augmented by human activities: presently, the community occupies most road batters in the area surrounding its original distribution region.

[MONTEIRO-HENRIQUES, J.C. COSTA & AGUIAR]

Arenario querioidis-Sedetum brevifolii Honrado, P. Alves, Hespanhol, Vieira & B. Caldas ass. nova hoc loco (39.3.1.)

[*Arenario-Cerastietum ramosissimi* Br.-Bl., P. Silva, Rozeira & Fontes 1952 var. *Sedum brevifolium*]

(*Festucetea indigestae*, *Jasiono sessiliflorae-Koelerieta-lia crassipedis*, *Hieracio castellanae-Plantaginion radi-catae*)

Diagnosis: Pioneer plant community on granite gravel in supratemperate (submediterranean) mountains of North-west Portugal (Peneda, Amarela, Gerês, Alvão, Montemuro, Estrela), dominated by *Arenaria querioides*, *Sedum brevifolium* and *Agrostis truncatula* subsp. *commista*.

Holotypus: Montalegre: Serra do Gerês, between Carris and Altar de Cabrões, 1410 m, NE, 1 m²: Characteristic species: 3 *Arenaria querioides*, 2 *Sedum brevifolium*, 1 *Agrostis commista*; Companion species: 1 *Tulipa australis*, + *Thymus caespititius*, + *Avenula sulcata*.

[J. HONRADO, P. ALVES, HESPANHOL, VIEIRA & B. CALDAS]

Arisaro simorrhini-Quercetum pyrenaicae Pinto-Gomes, P. Ferreira, Aguiar, Lousã, J.C. Costa, Ladero & Rivas-Martínez in Pinto-Gomes, P. Ferreira & Meireles 2007 corr. J. C. Costa & Pinto-Gomes hoc loco (60.3.2.) [≡*Arisaro vulgare-Quercetum pyrenaicae* Pinto-Gomes, P. Ferreira, Aguiar, Lousã, J.C. Costa, Ladero & Rivas-Martínez in Pinto-Gomes, P. Ferreira & Meireles 2007] (*Quercus-Fagetum sylvaticae*, *Quercetalia roboris*, *Quercion pyrenaicae*, *Quercenion pyrenaicae*)

Taxonomic correction: *Arisarum vulgare* should be *Arisarum simorrhinum*.

[PINTO-GOMES & J.C. COSTA]

Arrhenathero bulbosi-Armerietum beiranae Monteiro-Henriques, J.C. Costa, A. Bellu & Aguiar ass. nova hoc loco (45.2.1.)

(*Festucion merinoi*, *Agrostietalia castellanae*, *Stipogiantea-Agrostietea castellanae*)

Diagnosis: Hemicryptophytic grassland characterized by *Arrhenatherum elatius* subsp. *bulbosum*, *Armeria beirana*, *Centaurea herminii*, *Celtica gigantea*, *Agrostis castellana*, *Rumex angiocarpus*, *Dactylis lusitanica*, *Hypochoeris radicata*, *Agrostis truncatula*, *Avenula sulcata*, etc. (Table 2, *holotypus* relevé no. 3). In Spring *Armeria beirana* is the most abundant species in the fields with a pinkish hue, while in summer the predominant green hues are due to the dominance of grasses. Its occur in mesomediterranean, meso to supratemperate (submediterranean), humid to hyperhumid, eu-oceanic, on cambisols derived from granites, in the Beiraduriensian mountains (Montemuro, Leomil and Lapa). Subseral of *Holco mollis-Quercetum pyrenaicae*.

[MONTEIRO-HENRIQUES, J.C. COSTA, A. BELLU & AGUIAR]

Table 3

38.2.5. *Bartsia asperae-Origanetum virentis* ass. nova hoc loco

Altitude (l=10 m)	23	53	15	20	15	23	17
Orientation	W	NE	E	W	E	N	E
Surface (m ²)	16	20	16	24	40	40	24
pH	7.1	6.8	7.6	7.3	7.6	7.5	.
Nº of species	6	8	6	9	9	12	13
Ordinal number	1	2	3*	4	5	6	7
Characteristic species							
<i>Bartsia aspera</i>	1	1	2	1	2	2	1
<i>Origanum virens</i>	1	1	1	1	2	1	1
<i>Calamintha nepeta</i>	1	+	+	1	+	+	1
<i>Prunella x intermedia</i>	1	+	+	+	+	+	+
<i>Bupleurum paniculatum</i>	.	.	1	+	1	+	+
<i>Clinopodium arundanum</i>	.	+	1	+	.	+	+
<i>Anthyllis maura</i>	1	+	.	+	.	+	1
<i>Hypericum perforatum</i>	.	.	.	.	1	+	+
<i>Lathyrus sylvestris</i>	.	.	.	+	+	.	+
<i>Stachys lusitanica</i>	.	.	.	.	+	.	.
Companion species							
<i>Pulicaria odora</i>	+	.	.	+	.	+	1

Other companion species: + *Plantago coronopus*, + *Scilla monophyllus* in 2; 1 *Achillea ageratum* in 5; + *Carex hallerana*, + *Ononis pusilla*, + *Eryngium dilatatum* in 6; + *Carlina corymbosa*, + *Lavandula latifolia*, + *Lathyrus clymenum* in 7.

Localities: 1, 2, 4: Pombal; 3* (*holotypus*), 5: Taveira (Penela); 6: Condeixa; 7: Coimbra.

Bartsia asperae-Origanetum virentis C. Lopes, Lousã & Ladero ass. nova hoc loco (38.2.5.)

[*Bartsia asperae-Origanetum virentis* C. Lopes 2001 nom. inval. (art.1)]

(*Trifolio medii-Geranietea sanguinei*, *Origanetalia vulgaris*, *Origanion virentis*, *Stachyo lusitanicae-Cheirolophenion sempervirentis*)

Diagnosis: Perennial herbaceous community formed by *Bartsia aspera*, *Origanum virens*, *Calamintha baetica*, *Prunella x intermedia*, *Bupleurum paniculatum*, *Clinopodium arundanum*, *Anthyllis maura*, *Lathyrus sylvestris* (Table 3, *holotypus* relevé no. 1), which constitute the fringes of *Arisaro-Quercetum broteroi* and *Lonicero implexae-Quercetum broteroi* woods, in Jurassic soils with high pH (basic). With xeric and thermophilous character, they can be found on skeletal soils that (unlike *Leucanthemo sylvatici-Cheirolophenion sempervirentis*). Occures in the Dividing Portuguese Sector, in Mediterranean pluvisseasonal-oceanic, upper

thermomediterranean to lower mesomediterranean, dry to humid bioclimate. Included in the suballiance *Stachyo lusitanicae-Cheirolophenion sempervirentis*.

[C. LOPES, LOUSÃ & LADERO]

Bituminario bituminosae-Phalaridetum coerulescentis J.C. Costa, Capelo, Jardim & Sequeira ass. nova hoc loco (46.6.2.)

(*Molinio-Arrhenatheretea*, *Holoschoenetalia vulgaris*, *Gaudinio verticolae-Hordeion bulbosae*)

Diagnosis: Hemicryptophytic grassland of Madeira Island formed by *Phalaris coerulescens*, *Bituminaria bituminosa*, *Lolium multiflorum*, *Cynodon dactylon*, *Holcus lanatus*, *Carex divulsa*, etc. (Table 4, *holotypus* relevé nº 3). It occurs on vertisols, in areas with water runoff during winter or on the bottom of depressions, in Mediterranean xeric-oceanic, inframediterranean, dry to lower subhumid bioclimate.

[J.C. COSTA, CAPELO, JARDIM & SEQUEIRA]

Table 4

46.6.2. *Bituminario bituminosae-Phalaridetum coerulescentis* ass. nova hoc loco

Altitude (m)	75	130	90	80
Orientation	SE	-	NE	E
Surface (m ²)	20	20	20	20
Nº of species	15	18	15	18
Ordinal number	1	2	3*	4

Characteristic species

<i>Phalaris caerulescens</i>	3	3	3	3
<i>Lolium multiflorum</i>	2	1	1	.
<i>Cynodon dactylon</i>	.	1	+	2
<i>Holcus lanatus</i>	.	.	2	+
<i>Carex divulsa</i>	+	+	.	.

Companion species

<i>Bituminaria bituminosa</i>	1	+	2	2
<i>Bromus madritensis</i>	2	+	2	+
<i>Brachypodium distachyon</i>	+	1	2	1
<i>Avena fatua</i>	2	1	1	.
<i>Vicia parviflora</i>	+	3	+	.
<i>Rapistrum linneanum</i>	+	1	.	+
<i>Galactites tomentosa</i>	+	+	.	+
<i>Sonchus oleraceus</i>	+	+	.	+
<i>Bromus hordeaceus</i>	+	1	.	.
<i>Avena lusitanica</i>	.	1	.	+
<i>Mercurialis annua</i>	+	.	+	.
<i>Beta maritima</i>	+	.	.	+
<i>Hyparrhenia sinaica</i>	.	+	.	+
<i>Leontodon longirostris</i>	.	+	+	.
<i>Scorpiurus vermiculatus</i>	.	.	+	+
<i>Trifolium angustifolium</i>	.	.	+	+

Other companion species: +*Sonchus tenerrimus* in 1; 1 *Avena sterilis*, + *Cynara ferocissima* in 2; +*Bromus diandrus*, + *Urospermum picroides* in 3; 2 *Lolium rigidum*, 1 *Medicago polymorpha*, + *Echium plantagineum*, + *Scolymus hispanicus* in 4

Localities: 1, 3* (*holotypus*): Madeira Island, 2: Piedade (Ponta de S. Lourenço), 4: Baía de Abra (Ponta de S. Lourenço);

Campanulo primulifoliae-Rhododendretum pontici Vila-Viçosa, J.C. Costa, Quinto-Canas & Pinto-Gomes ass. nova hoc loco (59.9.6.)

(*Quercetea ilicis*, *Pistacio lentisci-Rhamnetales alaterni*, *Arbuto unedonis-Laurion nobilis*, *Rhododendrenion pontici*)

Diagnosis: Mediterranean pluviseasonal-oceanic, thermomediterranean to mesomediterranean, humid to ultrahyperhumid, barely hyperoceanic, microphanerophytic association, formed by *Rhododendron ponticum*, *Campanula primulifolia*, *Arbutus unedo*, *Erica arborea*, *Frangula alnus*, *Viburnum tinus*, *Ruscus aculeatus*, *Phillyrea latifolia*, *Rhamnus alaternus*, *Alnus glutinosa*, *Salix atrocinerea*, *Polystichum setiferum*, *Tamus communis*, *Aristolochia paucinervis*, *Euphorbia amygdaloides*, *Bryonia dioica*, *Sambucus nigra*, *Brachypodium sylvaticum*, *Teucrium scorodonia*, *Arum italicum* subsp. *negletum*, *Rubus ulmifolius*, *Pteridium aquilinum*, *Oenanthe crocata*, *Salix salviifolia* subsp. *australis*, *Vinca difformis*, etc. (Table 5, *holotypus* relevé no. 1). It occurs at the outer margins of streams and narrow watercourses, on siliceous soils derived from granitic rocks or shale, at the Monchique Mountain, in a band between *Cisto populifolii-Arbutetum unedonis* and *Campanulo primulifoliae-Alnetum glutinosae*.

[VILA-VIÇOSA, J.C. COSTA, QUINTO-CANAS & PINTO-GOMES]

Table 5

59.9.6. *Campanulo primulifoliae-Rhododendretum pontici* ass. nova hoc loco

Altitude (1=10 m)	50	44	25	30
Surface (m ²)	20	50	50	150
Nº of species	21	22	29	25
Ordinal number	1*	2	3	4

Characteristic species

<i>Rhododendron ponticum</i>	4	3	4	2
<i>Arbutus unedo</i>	1	2	2	1
<i>Frangula alnus</i>	2	2	1	1
<i>Erica arborea</i>	1	1	2	2
<i>Campanula primulifolia</i>	1	+	1	+
<i>Viburnum tinus</i>	.	1	1	+
<i>Ruscus aculeatus</i>	.	+	1	+
<i>Arum italicum</i> subsp. <i>negletum</i>	+	.	+	+
<i>Phillyrea latifolia</i>	.	+	.	+
<i>Rhamnus alaternus</i>	.	.	+	+
<i>Laurus nobilis</i>	.	1	.	.
<i>Myrica faya</i>	.	.	1	.
<i>Phillyrea angustifolia</i>	.	.	+	.
<i>Quercus suber</i>	.	.	.	+
<i>Smilax altissima</i>	.	.	.	+
<i>Hedera iberica</i>	.	.	.	+

Forestal species

<i>Aristolochia paucinervis</i>	+	1	+	+
<i>Tamus communis</i>	1	2	+	.
<i>Brachypodium sylvaticum</i>	.	+	+	+
<i>Alnus glutinosa</i>	1	1	.	.
<i>Salix atrocinerea</i>	1	.	1	.
<i>Polystichum setiferum</i>	1	+	.	.
<i>Euphorbia amygdaloides</i>	+	.	1	.
<i>Bryonia dioica</i>	1	.	+	.
<i>Sambucus nigra</i>	1	.	+	.
<i>Arenaria montana</i>	.	+	+	.
<i>Teucrium scorodonia</i>	.	+	+	.
<i>Iris foetidissima</i>	+	.	+	.
<i>Carex pendula</i>	.	1	.	.
<i>Primula vulgaris</i>	+	.	.	.
<i>Osmunda regalis</i>	.	+	.	.
<i>Blechnum spicant</i>	.	+	.	.
<i>Vinca difformis</i>	.	.	+	.
<i>Salix australis</i>	.	.	.	+
<i>Calamintha sylvatica</i>	.	.	.	+
<i>Limodorum abortivum</i>	.	.	.	+

Companion species

<i>Rubus ulmifolius</i>	1	2	2	1
<i>Pteridium aquilinum</i>	2	2	1	1
<i>Oenanthe crocata</i>	+	1	1	.
<i>Lonicera hispanica</i>	.	1	1	+
<i>Galium aparine</i>	+	.	+	.
<i>Heracleum sphondylium</i>	+	.	+	.

Other companion species: +*Prunella vulgaris* in 3; 1 *Cytisus scoparius* var. *oxyphyllus*, 1 *Genista triacanthos* var. *scorpioides*, + *Dittrichia revoluta* in 4

Localities: 1* (*holotypus*): Ribeira de Pisões; 2: Alferce; 3: Barranco do Corgo; 4: Covão da Eira (Marmeleite)

Cardamino hirsutae-Myosotidetum ramosissimae C. Lopes, Pinto-Gomes, Lousã, Ladero & J.C. Costa ass. nova hoc loco (37.2.1.)

[*Cardamino hirsutae-Myosotidetum ramosissimae* C. Lopes 2001 nom. inval. (art.1)]

(*Cardaminetea hirsutae*, *Geranio purpurei-Cardaminetalia hirsutae*, *Geranio pusilli-Anthriscion caucalidis*)

Diagnosis: Ephemeral community of small therophytes with a very short life cycle, developing on limestone, in dark fringes and people and animals' circulating paths, rich in organic matter. It is characterized by *Cardamine hirsuta*, *Geranium rotundifolium*, *Parietaria mauritanica*, and Atlantic species as *Myosotis ramosissima* subsp. *ramosissima*, *Moehringia pentandra*, *Draba muralis* (Table 6, *holotypus* relevé no. 4). Occurrence in the Dividing Portuguese territory, in Mediterranean pluvisesional-oceanic, mesomediterranean, subhumid to humid bioclimate.

Table 6

37.2.1. *Cardamino hirsutae-Myosotidetum ramosissimae* ass. nova hoc loco

Altitude (m)	300	350	350	350	370
Orientation	.	E	E	N	E
Surface (m ²)	10	10	20	20	20
Nº of species	7	13	13	12	15
Ordinal number	1	2	3	4*	5
Characteristic species					
<i>Geranium robertianum</i>	2	1	1	1	1
<i>Cardamine hirsuta</i>	1	1	2	1	2
<i>Geranium purpureum</i>	+	+	+	2	1
<i>Moehringia pentandra</i>	.	1	+	+	1
<i>Myosotis ramosissima</i>	.	+	+	+	1
<i>Draba muralis</i>	.	.	+	+	.
<i>Geranium pusillum</i>	.	1	.	.	.
<i>Galium aparine</i>	.	+	.	.	.
Companion species					
<i>Umbilicus rupestris</i>	1	+	+	+	+
<i>Ceterach officinarum</i>	+	+	+	+	+
<i>Alyssum minus</i>	.	+	+	+	+
<i>Arabidopsis thaliana</i>	.	+	+	+	+
<i>Stellaria media</i>	.	+	.	.	+
<i>Valerianella microcarpa</i>	.	.	.	+	+

Other companion species: 1 *Erodium moschatum* in 1; + *Urtica membranacea* in 2; + *Antirrhinum linkianum* in 3; 1 *Cerastium glomeratum*, + *Linum strictum*, + *Selaginella denticulata* in 5.

Localities: 1: Sicó (Pombal); 2: Alvaizere; 3, 4* (*holotypus*), 5: Road to Vale Centeio (Penela)

[C. LOPES, PINTO-GOMES, LOUSÃ & LADERO]

Carici lowei-Woodwardietum radicans J.C. Costa, Capelo, Jardim & Sequeira ass. nov hoc loco (26.4.1.) (*Anomodonto-Polypodietaea*, *Anomodonto-Polypodietaea*, *Thelypterido pozoi-Woodwardion radicans*)

Diagnosis: Mesotemperate community, humid to hyperhumid, hyperoceanic, dominated by *Woodwardia radicans*, on shadowy, terrigenous and mostly vertical walls, in *Clethro arboreae-Ocoteetum foetentis* environment, in Madeira Island.

Holotypus: Levada do Folhadal, 1100 m, NW, 6 m²: Characteristic species: 5 *Woodwardia radicans*, 1 *Diplazium caudatum*, + *Stegnogramma pozoi*, + *Carex lowei*, + *Asplenium monanthes*; Companion species: + *Athyrium filix-femina*, + *Festuca donax*.

[J.C. COSTA, CAPELO, JARDIM & SEQUEIRA]

Centaureo geresensis-Rumicetum indurati P. Alves & Honrado ass. nova hoc loco (28.1.1.) (*Phagnalo-Rumicetea indurati*, *Phagnalo saxatilis-Rumicetalia indurati*, *Rumici indurati-Dianthion lusitani*)

Diagnosis: Rupicolous mesomediterranean community, endemic to the valleys of large rivers of the Northwest

Iberian Peninsula (Minho, Lima, Cávado, Douro, Paiva), formed by *Rumex induratus*, *Centaurea aristata* subsp. *geresensis*, *Coincya cheiranthos* var. *recurvata*, *Arrhenatherum elatius* subsp. *baeticum* and *Anarrhinum bellidifolium*.

Holotypus: Ponte da Barca: Lindoso, Central do Alto Lindoso, 280 m, W, 10 m²: Characteristic species: 3 *Rumex induratus*, 2 *Anarrhinum bellidifolium*, 1 *Coincya recurvata*, 1 *Centaurea geresensis*, 1 *Arrhenatherum baeticum*; Companion species: 1 *Sedum arenarium*, 1 *Silene nutans*, 1 *Hypochoeris radicata*, + *Andryala integrifolia*, + *Jasione montana*, + *Sedum hirsutum*, + *Rumex angiocarpus*, + *Leucanthemum sylvaticum*.

[P. ALVES & J. HONRADO]

Centaureo lusitanae-Pseudarrhenatheretum longifolii Monteiro-Henriques, J.C. Costa, Aguiar, Honrado ass. nova hoc loco (45.2.2.)

(*Festucion merinoi*, *Agrostietalia castellanae*, *Stipogiganteae-Agrostietea castellanae*)

Diagnosis: Hemicryptophytic grassland with *Pseudarrhenatherum longifolium*, *Agrostis curtisii*, *Hypochoeris radicata*, *Agrostis x fouilladei*, *Centaurea herminii* subsp. *lusitana*, *Andryala integrifolia*, *Anthoxanthum amarum*, *Lotus corniculatus* subsp. *carpetanus*, *Dactylis lusitanica*, etc. (Table 7, *holotypus* relevé no. 9). Its occur on deep soils mostly derived from schists, sometimes from granites, in Arada, Freita and Montemuro mountains, in mesotemperate (submediterranean), humid to hyperhumid, semihyperoceanic bioclimate. Subseral community of the *Rusco aculeati-Quercetum roboris*. It follows the destruction of *Ulex* communities (*Ulic micranthi-Pterospartetum pterospartetosum cantabrici*) and pinewoods, either caused by wildfires or logging.

[MONTEIRO-HENRIQUES, J.C. COSTA, AGUIAR, HONRADO]

Clematido campaniflorae-Celtidetum australis Monteiro-Henriques, J.C. Costa, A. Bellu, Aguiar & Portela-Pereira ass. nova hoc loco (56.1.5.)

(*Fraxino angustifoliae-Ulmenion minoris*, *Populion albae*, *Populetales albae*, *Salici purpureae-Populetea nigrae*)

Diagnosis: Climactic, temporihygrophilous, deciduous micro to mesoforest, whose tree layer includes *Celtis australis*, *Fraxinus angustifolia* and *Salix atrocinerea*. Rich in lianas, like *Tamus communis*, *Clematis campaniflora*, *Rubus ulmifolius*, *Bryonia dioica*, *Hedera habernica*, *Lonicera periclymenum* subsp. *hispanica*, *Lonicera etrusca*, *Rosa pouzinii*, *Rosa canina* and *Vitis vinifera* (Table 8, *holotypus* relevé no. 2). *Clematis campaniflora* and *Polystichum setiferum* are differential species for this new association, as compared to *Ficario ranunculoidis-Fraxinetum angustifoliae*. It occurs in mesomediterranean, dry to humid, euoceanic bioclimate; occupies deep soils, frequently in narrow valleys that correspond to temporary streams and water resurgences, in the headwaters of the smaller Douro's tributaries of the Lusitanian-Duriensean territories. *Clematido campaniflorae-Rubetum ulmifolii*'s communities correspond to its fringe vegetation. It generally contacts with *Physofermo cornubiensis-Quercetum suberis* forests, and more rarely with *Rusco aculeati-Juniperetum lagunae*'s communities.

[MONTEIRO-HENRIQUES, J.C. COSTA, A. BELLU, AGUIAR & PORTELA-PEREIRA]

Table 7

45.2.2. *Centaureo lusitanae-Pseudarrhenatheretum longifolii* ass. nova hoc loco

Altitude (1=10 m)	42	67	34	37	59	71	82	70	56	76
Orientation	E	SW	N	W	NE	E	W	NE	N	S
Surface (m ²)	10	10	15	20	4	4	4	10	15	12
N° of species	8	9	15	13	12	14	14	13	15	15
Ordinal number	1	2	3	4	5	6	7	8	9*	10
Characteristic species										
<i>Pseudarrhenatherum longifolium</i>	3	2	2	2	3	3	4	2	3	1
<i>Agrostis curtisii</i>	2	1	1	1	1	1	2	2	1	3
<i>Hypochoeris radicata</i>	.	+	2	1	+	2	+	1	1	+
<i>Andryala integrifolia</i>	1	1	+	.	.	+	.	2	+	2
<i>Centaurea lusitana</i>	.	.	.	.	1	2	1	2	+	1
<i>Agrostis x fouilladei</i>	.	.	2	2	.	.	.	+	2	+
<i>Anthoxanthum amarum</i>	.	+	2	.	+	3	.	.	.	1
<i>Lotus carpetanus</i>	+	.	+	+	.	+	.	.	+	.
<i>Dactylis lusitanica</i>	1	.	.	+	.	.	.	.	.	.
<i>Rumex angiocarpus</i>	.	.	.	.	+	+	.	.	.	.
<i>Plantago lanceolata</i>	.	.	.	.	+	.	+	.	.	.
<i>Ranunculus nigrescens</i>	.	.	.	.	.	.	.	.	1	.
Companion species										
<i>Digitalis purpurea</i>	.	.	+	+	+	+	.	.	+	1
<i>Jasione montana</i>	.	+	+	1	.	.	.	.	+	.
<i>Hypericum linarifolium</i>	.	+	+	.	.	.	.	.	+	+
<i>Ulex minor</i>	.	.	.	.	1	.	2	.	.	+
<i>Sanguisorba verrucosa</i>	+	+	.	1	.	.	.	.	.	.
<i>Sesamoides purpurascens</i>	.	.	+	.	.	.	.	.	+	1
<i>Genista triacanthos</i>	+	.	+	.	.	.	.	.	.	+
<i>Erica cinerea</i>	.	.	.	.	.	+	2	.	.	.
<i>Briza maxima</i>	.	.	.	.	+	1	.	.	.	.
<i>Erica umbellata</i>	.	.	.	.	.	.	1	+	.	.
<i>Clinopodium arundanum</i>	+	.	.	+	.	.	.	.	.	.
<i>Calluna vulgaris</i>	.	.	+	.	.	+	.	.	.	.
<i>Lithodora prostrata</i>	.	.	.	.	.	+	+	.	.	.
<i>Pterospartum cantabricum</i>	.	.	.	.	.	+	.	+	.	.
<i>Galium saxatile</i>	.	.	.	.	.	.	+	.	+	.

Other companion species: +*Ranunculus bupleuroides* in 2; +*Silene nutans*, + *Ulex micranthus* in 3; +*Galium papillosum* subsp. *helodes*, + *Holcus lanatus*, + *Hypericum nummularium* in 4; +*Halimium alyssoides*, + *Micropyrum tenellum* in 5; 1 *Polygala vulgaris*, + *Carex pilulifera*, + *Cuscuta approximata* in 7; 1 *Sedum brevifolium*, + *Conopodium marizianum*, + *Deschampsia cespitosa*, + *Erica arborea*, + *Lactuca chondrilliflora* in 8; 1 *Brachypodium rupestre*, + *Ranunculus ollissiponensis* in 9; 1 *Anarrhinum bellidifolium*, + *Centaurea melanosticta*, + *Cytisus multiflorus* in 10

Localities: 1: Parada de Ester (Castro Daire), 2, 8: between Sete Fontes and Covas do Rio (São Pedro do Sul), 3: between Sete Fontes and Nodar (São Pedro do Sul), 4: Ponte de Cabril (Castro Daire), 5: Santo Estevão (São Pedro do Sul), 6: between Sá and Posmil (São Pedro do Sul), 7: Near Macieira (São Pedro do Sul), 9* (*holotypus*): Sete Fontes (São Pedro do Sul), 10; between S. Joaninho and Fareijinhas (Castro Daire)

Corynephorion maritimi J.C. Costa, Pinto-Gomes & Neto all. nova hoc loco (40.10.)

(*Cutandietalia maritimae*, *Tuberarietea guttatae*)

Typus alliancia: *Herniario maritimae-Corynephorium maritimi* Pinto-Gomes, P. Ferreira, Cano & S. Mendes in Acta Bot. Gallica 153(3): 344, 2006.

Diagnosis: Inland dunes and paleodunes associations, characterized by *Corynephorus canescens* subsp. *maritimus*, in Mediterranean pluviseasonal-oceanic thermomediterranean to lower mesomediterranean, dry to subhumid, euhyperoceanic to barely hyperoceanic bioclimate. Provisionally placed in the *Cutandietalia maritimae* as it is formed by hemicryptophytes and small short-live chamaephytes, accompanied by therophytes. Coastal Lusitanian-Andalusian and Galician-Portuguese distribution.

Characteristic species: *Anagallis monelli* var. *linifolia*, *Anagallis monelli* var. *microphylla*, *Corynephorus canescens* var. *maritimus*, *Echium gaditanum*, *Herniaria ciliolata* subsp. *robusta*, *Herniaria maritima*, *Herniaria scabrida* var. *unamunoana*, *Sedum sediforme* (ter.), *Sesamoides spathulifolia*.

Echium gaditanae-Corynephorium maritimae J.C. Costa, Neto, Pinto-Gomes & Lousã ass. nova hoc loco (40.10.1.)

Diagnosis: Thermomediterranean dry barely hyperoceanic Algarvian inland dunes, dominated by *Corynephorus canescens* var. *maritimus* accompanied by *Echium gaditanum*, *Malcolmia littorea*, *Silene nicaeensis*, *Sedum sediforme*, *Lotus creticus*, *Cyperus capitatus*, *Plantago macrorhiza*, *Thymus carnosus*, etc. (Table 9, *holotypus* relevé no. 6). It contacts with *Artemisio crithmifoliae-Armerietum pungentis*.

Herniario maritimae-Corynephorum maritimi Pinto-Gomes, P. Ferreira, Cano & S. Mendes in Acta Bot. Gallica 153(3): 344, 2006 (40.10.2.)

Herniario robustae-Corynephorum maritimi Pinto-Gomes, P. Ferreira, Cano & S. Mendes in Acta Bot. Gallica 153(3): 345, 2006 (40.10.3)

[sin. *Sedo sediformis-Corynephorum maritimi* Honrado, P. Alves, Lomba, J. Vicente, G. Silva & Nepomucemo in Silva Lusit. 14 (2): 270, 2007 (syntax. syn.)

Herniario unamunoanae-Corynephorum maritimi Pinto-Gomes, P. Ferreira, Cano & S. Mendes in Acta Bot. Gallica 153(3): 348, 2006 (40.10.4.)

Linario polygaliphyllae-Corynephorum maritimi J. Rodriguez, Ortiz & Pulgar 1988 corr. J.C. Costa, Neto, Pinto-Gomes & Lousã corr. hoc loco. (40.10.5.)
The taxon correct is *Corynephorus canescens* var. *maritimus*.

[J.C. COSTA, NETO, PINTO-GOMES & LOUSÃ]

Table 8

56.1.5. *Clematido campaniflorae-Celtidetum australis* ass. nova hoc loco

Altitude (m)	145	150	275	200	605	125	490
Orientation	E	E	W	NW	N	E	N
Surface (m ²)	50	50	100	50	30	100	60
Nº of species	23	15	23	27	21	12	17
Ordinal number	1	2*	3	4	5	6	7
Characteristics species							
<i>Celtis australis</i>	5	5	4	4	3	5	2
<i>Tamus communis</i>	3	2	1	+	1	2	2
<i>Fraxinus angustifolia</i>	.	2	2	1	1	2	4
<i>Rubus ulmifolius</i>	2	.	3	1	2	1	2
<i>Polystichum setiferum</i>	+	+	+	1	1	.	1
<i>Salix atrocinerea</i>	1	1	1	2	2	.	.
<i>Arum italicum</i>	1	2	.	+	1	.	1
<i>Clematis campaniflora</i>	2	2	1	1	.	.	.
<i>Crataegus spinosa</i>	1	.	+	.	.	1	+
<i>Bryonia dioica</i>	2	2	+	.	.	1	.
<i>Hedera hibernica</i>	.	.	4	1	.	.	2
<i>Lonicera hispanica</i>	.	.	1	+	.	.	1
<i>Celtis australis</i> (frut.)	2	1	.	+	.	.	.
<i>Brachypodium sylvaticum</i>	+	.	+	+	.	.	.
<i>Sambucus nigra</i>	.	.	2	.	1	.	.
<i>Silene latifolia</i>	.	1	.	.	1	.	.
<i>Teucrium scorodonia</i>	.	.	.	1	.	+	.
<i>Vinca difformis</i>	.	.	.	.	.	4	.
<i>Prunus insititia</i>	.	.	2	.	.	.	.
<i>Alnus glutinosa</i>	.	.	.	.	1	.	.
<i>Rosa pouzinii</i>	.	.	.	.	1	.	.
<i>Pyrus cordata</i>	.	.	.	.	.	.	1
<i>Ulmus minor</i>	.	.	+	.	.	.	.
<i>Rosa canina</i>	.	.	+	.	.	.	.
<i>Scrophularia scorodonia</i>	.	.	+	.	.	.	.
<i>Vitis vinifera</i>	.	.	+	.	.	.	.
<i>Prunus spinosa</i>	.	.	.	+	.	.	.
Companions species							
<i>Oenanthe crocata</i>	1	+	.	1	+	.	1
<i>Geranium purpureum</i>	1	.	.	+	+	.	+
<i>Ruscus aculeatus</i>	2	3	.	1	.	.	.
<i>Galium aparine</i>	3	3	.	+	.	.	.
<i>Angelica sylvestris</i>	+	.	.	+	1	.	.
<i>Arbutus unedo</i>	+	.	.	+	.	1	.
<i>Urtica dioica</i>	.	.	.	.	2	.	2
<i>Chelidonium majus</i>	.	.	+	.	2	.	.
<i>Pistacia terebinthus</i>	1	.	.	.	.	+	.
<i>Laurus nobilis</i>	.	.	1	.	+	.	.
<i>Pteridium aquilinum</i>	.	.	+	.	1	.	.
<i>Asplenium quadrivalens</i>	+	.	.	.	.	+	.
<i>Geranium lucidum</i>	.	.	.	.	.	.	.
<i>Osyris alba</i>	.	+	+	.	.	.	.
<i>Erica arborea</i>	1	.	.	.	1	.	.

Other companion species: +*Cynosurus echinatus*, + *Asparagus acutifolius*, + *Asplenium billotii* in 1; 2 *Geranium robertianum*, + *Pecedanum officinale* in 2; +*Dactylis lusitanica*, + *Ficus carica*, + *Rhus coriaria* in 3; +*Lamium maculatum*, + *Anthriscus sylvestris*, + *Polypodium cambricum* in 4.

Localities: 1, 2* (*holotypus*): Near Tedo river mouth (Vila Seca, Armamar), 3: between Lamego and Balsemão, 4: Balsemão river (Lamego), 5: between Coura and Vila Seca (Armamar), 6: Távora river (Adorigo, Tabuaço), 7: between Vila Seca and Santo Adrião (Coura, Armamar)

Table 9
40.10.1. *Echio gaditanae-Corynephoretum maritimae* ass. nova hoc loco

	6	6	8	6	6	6	8	8	6	6	6	8	8	6	6	8	10	10	10	6	
Surface (m ²)	12	18	16	17	20	17	16	15	17	25	10	10	18	13	13	14	15	16	17	18	
N° of species	1	2	3	4	5	6*	7	8	9	10	11	12	13	14	15	16	17	18	17	18	
Ordinal number	4	4	3	3	3	4	3	3	4	3	3	3	3	3	3	3	3	3	3	2	
Characteristic species																					
<i>Corynephorus maritimus</i>	.	.	.	.	.	1	+	+	+	1	+	+	1	+	+	1	1	1	+	+
<i>Echium gaditanum</i>	+	1	+	+	+	1	+	1	+	.	.	.	+	1	+	.	.	.	.	.
<i>Sedum sediforme</i>	.	.	1	+	1	1	+	+	+	.	.	.	.	.	.	.	.	.	.	.
<i>Plantago macrorhiza</i>	.	.	.	+	.	2	1	.	.	.	.	.	+	.	.	.	.	.	.	.
<i>Seseli tortuosum</i>	.	.	.	+	.	.	.	+	+	1	.	.	.	.	.	.	.	.	.	.
<i>Sesamoides spatulipholia</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>Anagallis microphylla</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Characteristic of <i>Cutandetalia maritimae</i>																					
<i>Silene nicaeensis</i>	+	+	.	2	1	+	+	.	+	1	+	.	+	+	1	+	1	+	+	+	
<i>Linaria pedunculata</i>	.	.	.	.	+	+	.	.	+	.	.	+	+	.	.	.	.	.	.	.
<i>Hedynois arenaria</i>	.	+	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
<i>Medicago littoralis</i>	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.
<i>Leucojum trichophyllum</i>	.	.	.	.	.	.	.	.	1	+	.	.	.	.	.	.	.	.	.	.
<i>Ononis variegata</i>	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.
<i>Pseudorhiza pumila</i>	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.
<i>Cutandia maritima</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>Coronilla remanda</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Characteristic of <i>Euphorbio-Ammophiletea</i>																					
<i>Malcolmia littorea</i>	1	+	+	+	1	+	+	.	.	+	+	.	+	+	+	+	+	+	+	+	
<i>Lotus creticus</i>	+	1	+	.	.	+	+	.	+	+	.	.	+	.	.	.	.	.	.	.
<i>Cyperus capitatus</i>	+	+	+	+	.	.	.	.	.	.	+	+	+	.	.	.	.	.	.	.
<i>Crucianella maritima</i>	+	+	+	+	.	.	.	.	.	.	.	+	.	+	+	+	1	.	.	.
<i>Pancratium maritimum</i>	.	+	+	+	.	.	.	.	+	+	.	.	.	+	+	+	+	+	+	+
<i>Artemisia crithmifolia</i>	1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	1	1
<i>Helichrysum picardii</i>	.	+	+	+	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.
<i>Thymus carnosus</i>	.	1	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.
<i>Ononis ramosissima</i>	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	2	.
<i>Linaria lamarekii</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>Armeria pungens</i>	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
<i>Aetheorhiza bulbosa</i>	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.
<i>Medicago marina</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Companion species																					
<i>Paronychia argentea</i>	1	+	2	1	1	+	1	1	.	1	.	2	1	2	+	1	+	+	.	.	
<i>Reichardia gaditana</i>	.	+	1	+	+	+	1	1	+	1	+	.	+	.	.	.	.	.	.	.
<i>Vulpia alopecurus</i>	.	1	1	.	1	.	+	+	.	.	1	1	+	.	.	.	.	.	.	.

<i>Calendula algarbiensis</i>	+																		+					
<i>Plantago coronopus</i>					1																			
<i>Euphorbia terracina</i>																								
<i>Cladonia mediterranea</i>																								
<i>Carpobrotus edulis</i>					1																	2		
<i>Pycnocomon rutifolium</i>	1																							
<i>Scolymus hispanicus</i>																								
<i>Salsola vermiculata</i>										1														
<i>Allium subvillosum</i>						1																		
<i>Lolium rigidum</i>																								
<i>Frankenia laevis</i>																								
<i>Lagurus ovatus</i>																								
<i>linx strictum</i>																								
<i>Carduus meoanthis</i>																								
<i>Arctotheca calendula</i>																								

Localities:

- 1: Ponta do Medo Grande (Portimão);
- 2: Arraial do Barril (Ilha de Tavira);
- 3: Ilha de Armona (Olhão);
- 4: Ilha da Culatra (Olhão);
- 5: Arraial do Barril (Ilha de Tavira);
- 6* (*holotypus*): Ilhéu das Ratas (Faro);
- 7: Ilha da Culatra (Olhão);
- 8: Manta Rota (Vila Real de Stº Antºnio);
- 9: Quinta de Marim (Olhão);
- 10: Quinta de Marim (Olhão);
- 11: Ilha da Barreta (Faro);
- 12: Ilha de Tavira;
- 13: Ilha da Barreta (Faro);
- 14: Cacela (Vila Real de Stº Antºnio);
- 15: Ancão (Loulé);
- 16: Ponta do Rio Velho (Lagos);
- 17: Meia-Praia (Lagos); 18: Alvor (Portimão)

Table 10
59.7.2. *Cytiso grandiflori-Arbutetum unedonis* ass. nova hoc loco

Altitude (m)	345	555	295	425	115	370	85	380	460	375
Orientation	E		E	NW	N	SW	N	SE	NE	NW
Surface (m ²)	100	60	100	200	100	100	100	50	150	100
N° of species	21	20	27	24	19	24	10	23	24	22
Ordinal number	1	2	3*	4	5	6	7	8	9	10
Characteristic species										
<i>Arbutus unedo</i>	4	5	5	4	3	4	4	4	4	5
<i>Erica arborea</i>	.	1	3	2	2	2	3	2	2	2
<i>Ruscus aculeatus</i>	.	.	1	1	3	2	+	2	2	3
<i>Cytisus grandiflorus</i>	+	2	2	1	+	1	.	.	.	.
<i>Daphne gnidium</i>	2	2	.	1	1	.	.	+	.	+
<i>Osyris alba</i>	2	.	.	.	+	1	1	+	.	2
<i>Rubia peregrina</i>	+	2	1	.	.	.	.	+	+	1
<i>Quercus rotundifolia</i> (frut.)	1	.	.	1	3	.	.	1	1	.
<i>Pistacia terebinthus</i>	.	.	2	1	2	.	.	1	+	.
<i>Phillyrea angustifolia</i>	.	.	.	1	1	.	.	+	2	.
<i>Hedera hibernica</i>	.	.	+	.	.	2	.	.	.	3
<i>Quercus suber</i>	.	.	.	+	1	.	.	.	3	.
<i>Lonicera etrusca</i>	.	.	.	1	1	.	1	.	.	.
<i>Asplenium onopteris</i>	.	.	.	.	.	+	.	+	.	2
<i>Asparagus acutifolius</i>	.	.	.	.	+	.	.	+	.	.
<i>Arbutus unedo</i> (frut.)	.	.	.	2	.	.	.	.	.	.
<i>Quercus suber</i> (frut.)	.	.	.	.	.	.	.	.	2	.
<i>Juniperus lagunae</i>	.	.	.	.	1	.	.	.	.	.
<i>Scilla monophyllos</i>	+	.	.	.	.	.	.	.	.	.
<i>Melica arrecta</i>	.	.	+	.	.	.	.	.	.	.
<i>Olea sylvestris</i>	.	.	.	.	+	.	.	.	.	.
<i>Arisarum simorrhinum</i>	.	.	.	.	.	.	.	+	.	.
Forestal species										
<i>Tamus communis</i>	+	+	1	+	+	.	.	+	+	1
<i>Quercus faginea</i>	1	.	.	1	+	+	1	+	1	.
<i>Lonicera hispanica</i>	.	+	+	1	1	+	.	.	1	+
<i>Crataegus monogyna</i>	.	.	+	+	.	+	.	+	+	+
<i>Quercus pyrenaica</i>	3	.	.	+	.	.	.	.	1	+
<i>Teucrium scorodonia</i>	.	.	+	.	.	1	.	.	+	+
<i>Rosa canina</i>	.	.	.	+	.	1	.	.	.	+
<i>Linaria triornithophora</i>	.	.	+	.	.	+	.	.	+	.
<i>Ranunculus ollisiponensis</i>	.	.	.	+	.	.	+	.	+	.
<i>Cephalanthera longifolia</i>	.	1	+	.	.	.	.	.	.	.
<i>Euphorbia amygdaloides</i>	.	.	.	+	.	1	.	.	.	.
<i>Fraxinus angustifolia</i>	.	.	.	.	.	+	.	.	+	.
<i>Genista falcata</i>	.	.	+	.	.	+	.	.	.	.
<i>Scrophularia scorodonia</i>	.	.	+	.	.	.	.	+	.	.
<i>Sedum forsterianum</i>	.	+	+	.	.	.	.	.	.	.
Companion species										
<i>Rubus ulmifolius</i>	.	1	1	.	.	.	.	.	2	+
<i>Dactylis lusitanica</i>	+	.	.	.	+	+	.	+	.	.
<i>Geranium purpureum</i>	+	.	.	.	.	.	+	.	+	+
<i>Lavandula sampaioana</i>	+	+	+	+	.	.	.	.	.	.
<i>Urginea maritima</i>	2	.	+	.	.	.	.	+	.	.
<i>Cytisus multiflorus</i>	.	+	.	.	.	+	.	.	.	1
<i>Cistus salvifolius</i>	+	+	+	.	.	.	.	.	.	.
<i>Thapsia villosa</i>	+	.	.	+	+	.	.	.	.	.
<i>Arenaria montana</i>	+	.	.	.	.	.	.	.	+	.
<i>Ferula communis</i>	.	.	+	.	.	.	+	.	.	.
<i>Lotus carpetanus</i>	+	+	.	.	.	.	.	.	.	.
<i>Malva tournefortiana</i>	.	.	+	.	.	.	.	.	.	+
<i>Melica magnolia</i>	.	.	.	+	.	.	.	.	+	.
<i>Melica uniflora</i>	.	.	.	.	.	.	.	+	.	+
<i>Sanguisorba verrucosa</i>	+	.	+	.	.	.	.	.	.	.
<i>Ulex latebracteatus</i>	.	+	.	.	.	.	+	.	.	.

Other companion species: 1 *Briza maxima* in 1; 2 *Cytisus striatus*, 1 *Pinus pinaster*, + *Ulex minor*, + *Margotia gummifera*, + *Aira cupaniana* in 2; + *Conopodium marizianum*, + *Cynodon dactylon*, + *Silene latifolia* in 3; 1 *Cistus populifolius*, + *Cistus ladanifer* in 4; 1 *Castanea sativa*, + *Cistus psilosepalus*, + *Digitalis purpurea*, + *Holcus lanatus*, + *Polystichum setiferum*, + *Pteridium aquilinum* in 6; + *Silene nutans*, + *Hypericum perforatum*, + *Asplenium quadrivalens* in 8; + *Rhus coriaria*, + *Asphodelus lusitanicus* subsp. *ovoideus* in 9; + *Cytisus scoparius*, + *Brachypodium sylvaticum*, + *Silene coutinhoi* in 10

Localities: 1: between Barragem do Varosa and Sande (Lamego); 2: between Aldeia de Baixo and Armamar; 3* (*holotypus*): near Barragem do Varosa (Lamego); 4: Coura between Vila Seca and Santo Adrião (Armamar); 5: between the mouth of the Tedo River and the E.T.A.R. (Armamar); 6: between Lamego and Balsemão; 7: Parada do Bispo (Lamego); 8: between Lamego and Santa Comba; 9: Vila Seca (Armamar); 10: Picoto (Lamego)

Cypero micheliani-Ranunculetum trilobi Rivas Goday 1964 corr. J.C. Costa, V. Silva & Neto hoc loco (7.1.2.) [≡ *Cypero micheliani-Ranunculetum sardo* Rivas Goday 1964] (*Bidentetea tripartitae*, *Bidentetalia tripartitae*, *Bidentetion tripartitae*)

Ranunculus trilobus Desf. is the species which occurs in the territory where the association has been described: the Guadiana basin in the province of Badajoz. *Ranunculus sardous* Crantz a very similar species to this one, that only has been signed in some points in the North and Northeast of the Iberian Peninsula.

[J.C. COSTA, V. SILVA & NETO]

Cytiso grandiflori-Arbutetum unedonis Monteiro-Henriques, J.C. Costa & Aguiar ass. nova hoc loco (59.7.2.) (*Quercetea ilicis*, *Pistacio lentisci-Rhamnetalia alaterni*, *Ericion arborea*)

Diagnosis: Mediterranean pluviseasonal-oceanic, meso-mediterranean, subhumid to humid, occasionally dry, euoceanic, Lusitanian-Duriensean community, on soils derived from the Douro Group metasediments. Pre-forest dominated by *Arbutus unedo*, geovicarious of *Erico scopariae-Arbutetum unedonis*, from which differs for the presence of *Cytisus grandiflorus*, *Lonicera etrusca*, *Quercus faginea*, *Lonicera hispanica*, *Olea sylvestris*, *Asparagus acutifolius*, *Arisarum simorrhinum*, *Melica minuta* subsp. *arrecta* and for the absence of *Ericion umbellatae* species, like *Erica cinerea*, *Erica australis*, *Calluna vulgaris*, *Lithodora prostrata* subsp. *prostrata* etc. (Table 10, *holotypus* relevé no. 3). Subseral community of *Hedero hibernicae-Quercetum fagineae*, *Physospermo cornubiensis-Quercetum suberis quercetosum fagineae*, *Rusco aculeati-Juniperetum lagunae* and *Teucrio salviastrum-Quercetum rotundifoliae*'s forests.

[MONTEIRO-HENRIQUES, J.C. COSTA & AGUIAR]

Damasonio bourgaei-Crypsietum aculeatae Rivas-Martínez & Costa in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980 corr. V. Silva & J.C. Costa hoc loco (8.6.3.)

[≡ *Damasonio alismatis-Crypsietum aculeatae* Rivas-Martínez & Costa in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980]

(*Isoeto-Nanojuncetea*, *Nanocyperetalia*, *Verbenion supinae*)

Taxonomic correction: *Damasonium alisma* should be *Damasonium bourgaei*.

[V. SILVA & J.C. COSTA]

Diantho langeani-Festucetum summilusitanae Monteiro-Henriques, J.C. Costa, Aguiar, Honrado & A. Bellu ass. nova hoc loco (39.3.3.)

(*Festucetea indigestae*, *Jasiono sessiliflorae-Koelerieta lia crassipedis*, *Hieracio castellani-Plantaginion radiatae*)

Diagnosis: Orophilous hemicyptophytic grassland, characterized by *Festuca summilusitana*, *Dianthus langeanus*, *Ornithogalum concinnum*, *Sesamoides purpurascens*, *Allium scorzonerifolium*, *Silene acutifolia*, *Teucrium salviastrum*, etc. (Table 11, *holotypus* relevé no. 2). This community is restricted to crevices in the rocky schist crests of the Arada-São Macário massif higher elevations, on leptosols derived from siliceous

metasediments, in meso to supratemperate (submediterranean), hyperhumid, semihyperoceanic bioclimate. Permanent community (permaseries) occurring within the *Rusco aculeati-Quercetum roboris* climactic domain.

Table 11

39.3.3. **Diantho langeani-Festucetum summilusitanae** ass. nova hoc loco

Altitude (1=10m)	67	91	89
Orientation	NW	SE	NW
Surface (m ²)	4	4	8
N° of species	9	7	15
Ordinal number	1	2*	3
Characteristic species			
<i>Festuca summilusitana</i>	3	3	3
<i>Dianthus langeanus</i>	2	1	+
<i>Ornithogalum concinnum</i>	.	+	+
<i>Sesamoides purpurascens</i>	1	.	.
<i>Allium scorzonerifolium</i>	.	.	1
<i>Conopodium marizianum</i>	.	.	+
<i>Ranunculus gramineus</i>	.	.	+
<i>Ranunculus nigrescens</i>	.	.	+
Companion species			
<i>Silene acutifolia</i>	2	.	+
<i>Sedum brevifolium</i>	+	1	.
<i>Hypochoeris radicata</i>	+	.	+
<i>Teucrium salviastrum</i>	.	+	+

Other companion species: + *Digitalis purpurea*, + *Jasione montana*, + *Rumex angiocarpus* in 1; + *Sedum hirsutum*, + *Thymus caespitosus* in 2; + *Lotus carpetanus*, + *Micropyrum tenellum*, + *Scilla monophyllos*, + *Simethis mattiazi*, + *Tuberaria lig-nosa* in 3;

Localities: 1: Aldeia da Pena (S. Pedro do Sul), 2* (*holotypus*): between Maceira and Aldeia da Pena (S. Pedro do Sul), 3: between S. Macário and Aldeia da Pena (S. Pedro do Sul)

[MONTEIRO-HENRIQUES, J.C. COSTA, AGUIAR, HONRADO & A. BELLU]

Eryngio juresiani-Betuletum celtibericae Honrado, P. Alves, Pulgar, Ortiz & B. Caldas ass. nova hoc loco (60.5.1.) [*Luzulo henriquesii-Betuletum celtibericae* Rivas-Martínez 1964 nom. mut. subas. *anemonetosum albidae* Pulgar ined.] (*Quercu-Fagetea*, *Betulo pendulae-Populeta lia tremulae*, *Betulion celtiberico-fontquerii*)

Diagnosis: Climax birch (*Betula celtiberica*) forests of the highest elevations of the Serra do Gerês, temperate oceanic supratemperate to suprasubmediterranean (upper horizon), differentiated by the Northwest Iberian endemics *Eryngium juresianum*, *Anemone trifolia* subsp. *albida* and *Laserpitium thalictrifolium*.

Holotypus: Terras de Bouro: Serra do Gerês, Madorno, 1110 m, N, 64 m²: Characteristic species: 4 *Betula celtiberica*, 3 *Hedera hibernica*, 2 *Vaccinium myrtillus*, 2 *Saxifraga spathularis*, 2 *Taxus baccata*, 1 *Sorbus aucuparia*, 1 *Ilex aquifolium*, 1 *Lonicera periclymenum*, 1 *Brachypodium sylvaticum*, 1 *Dryopteris affinis*, 1 *Quercus robur*, 1 *Anemone albida*, 1 *Fagus sylvatica* (naturalized), 1 *Lilium martagon*, + *Eryngium juresianum*, + *Physospernum cornubiense*, + *Teucrium scorodonia*, + *Viola riviniana*, + *Laserpitium thalictrifolium*, + *Euphorbia amygdaloides*, + *Primula acaulis*; Companion species: 2 *Blechnum spicant*, 2 *Rubus* sp. pl., 1 *Erica arborea*, 1 *Centaurea rivularis*, + *Frangula alnus*, + *Pyrus cordata*.

[J. HONRADO, P. ALVES, PULGAR, ORTIZ & B. CALDAS]

Table 12

60.4.1. *Fraxino angustifoliae-Aceretum monspessulani* ass. nova hoc loco

Altitude (m)	175	489	315	305	295	275	325	265	230	255
Orientation	N	W	NW	NW	NW	NE	N	N	N	N
Area (m ²)	120	50	50	200	150	200	200	100	150	100
Slope (g)	70	40	40	30	35	30	45	45	80	45
Total coverage (%)	80	90	100	100	100	100	100	100	100	100
N° of species	33	16	19	39	30	45	39	28	35	24
Ordinal number	1	2	3*	4	5	6	7	8*	9	10
Characteristics										
<i>Acer monspessulanum</i>	4	2	3	4	3	4	3	3	4	4
<i>Fraxinus angustifolia</i>	2	3	3	2	4	2	4	2	1	3
<i>Hedera hibernica</i>	1	+	3	3	3	2	3	2	4	3
<i>Crataegus monogyna</i>	+	+	2	+	1	1	3	+	1	1
<i>Polystichum setiferum</i>	.	+	2	1	1	+	+	1	+	1
<i>Arbutus unedo</i>	+	1	+	3	1	2	2	+	+	.
<i>Castanea sativa</i>	.	.	1	1	2	2	2	1	+	+
<i>Quercus broteroana</i>	.	.	+	+	+	+	+	2	2	1
<i>Tamus communis</i>	+	1	1	.	.	2	1	1	+	2
<i>Teucrium scorodonia</i>	.	.	+	1	1	1	2	+	.	+
<i>Lonicera hispanica</i>	+	1	2	.	.	1	2	+	+	1
<i>Quercus faginea</i>	.	2	1	3	3	3	2	.	.	.
<i>Laurus nobilis</i>	.	.	.	+	+	.	+	3	3	1
<i>Brachypodium sylvaticum</i>	1	.	.	1	2	2	1	.	+	.
<i>Linaria triornithophora</i>	.	.	.	+	1	.	1	+	+	+
<i>Sedum forsterianum</i>	.	.	.	+	.	1	+	+	+	+
<i>Quercus duriensis</i>	.	.	+	+	+	+	1	.	.	.
<i>Euphorbia amygdaloides</i>	.	.	+	+	+	1	+	.	.	.
<i>Rosa canina</i>	.	.	1	1	3	2	.	.	.	.
<i>Galium mollugo</i>	.	.	.	+	+	1	1	.	.	.
<i>Clinopodium arundanum</i>	.	.	.	+	.	1	+	.	+	.
<i>Sambucus nigra</i>	.	.	.	.	+	.	.	+	+	+
<i>Bryonia dioica</i>	.	.	1	.	.	.	+	.	+	.
<i>Melica uniflora</i>	.	.	.	+	.	.	1	.	+	.
<i>Silene nutans</i>	+	.	.	.	.	2	1	.	.	.
<i>Lonicera etrusca</i>	.	.	.	+	+	+	.	.	.	.
<i>Polygonatum odoratum</i>	.	+	.	.	.	.	.	+	.	+
<i>Prunus avium</i>	.	.	.	.	.	+	.	+	.	+
<i>Arenaria montana</i>	.	.	.	.	.	2	1	.	.	.
<i>Sorbus latifolia</i>	.	.	.	1	.	.	1	.	.	.
<i>Acer monspessulanum</i> (frut.)	.	.	.	.	.	1	+	.	.	.
<i>Quercus faginea</i> (frut.)	.	.	.	.	.	1	+	.	.	.
<i>Origanum virens</i>	.	.	.	.	.	1	+	.	.	.
<i>Hypericum perforatum</i>	.	.	.	.	.	1	+	.	.	.
<i>Crepis lamsanoides</i>	.	.	.	.	.	.	.	+	.	1
<i>Juglans regia</i>	.	1	.	.	.	.	.	.	.	.
<i>Prunus spinosa</i>	.	.	.	.	.	1	.	.	.	.
<i>Fraxinus angustifolia</i> (frut.)	.	.	.	.	.	.	1	.	.	.
<i>Corylus avellana</i>	.	.	.	.	.	.	.	.	1	.
<i>Silene latifolia</i>	.	.	.	.	+	.	.	.	.	.
<i>Clematis campaniflora</i>	.	.	.	.	.	+	.	.	.	.
<i>Calamintha baetica</i>	.	.	.	.	.	+	.	.	.	.
<i>Arabis stenocarpa</i>	.	.	.	.	.	+	.	.	.	.
<i>Quercus pyrenaica</i>	.	.	.	.	.	.	.	.	+	.
<i>Athyrium felis-foemina</i>	.	.	.	.	.	.	.	.	+	.
<i>Hypericum pulchrum</i>	.	.	.	.	.	.	.	.	+	.
Differentials of the subassociation <i>prunetosum lusitanicae</i>										
<i>Prunus lusitanica</i>	.	.	.	.	.	.	.	1	1	1
<i>Viburnum tinus</i>	.	.	.	.	.	.	.	2	4	.
<i>Phillyrea latifolia</i>	.	.	.	.	.	.	.	1	2	.
Characteristics of <i>Quercetea ilicis</i>										
<i>Ruscus aculeatus</i>	2	.	.	2	1	1	+	2	+	+
<i>Asplenium onopteris</i>	+	.	.	1	+	+	1	1	+	+
<i>Rubia peregrina</i>	.	.	.	1	+	2	1	1	+	+
<i>Erica arborea</i>	.	1	.	1	1	1	1	.	+	.
<i>Osyris alba</i>	.	.	.	2	1	1	2	+	.	.
<i>Pistacia terebinthus</i>	3	.	+	+	1	.	+	.	.	.
<i>Phillyrea angustifolia</i>	1	.	.	+	+	.	.	.	.	.
<i>Quercus rotundifolia</i>	1	.	.	+	.	+	.	.	.	.
<i>Daphne gnidium</i>	1	.	.	.	.	.	.	.	+	.
<i>Carex distachya</i>	.	.	.	.	.	.	.	+	.	+

Other companion species

<i>Rubus ulmifolius</i>	+	1	2	.	+	2	2	+	3	2
<i>Pteridium aquilinum</i>	.	.	+	+	.	1	+	.	+	1
<i>Geranium purpureum</i>	.	1	2	.	+	.	.	.	+	+
<i>Asplenium quadrivalens</i>	+	.	.	+	+	.	+	.	+	.
<i>Cytisus grandiflorus</i>	.	.	.	+	+	1	+	.	.	.
<i>Dactylis lusitanica</i>	+	.	.	.	.	+	.	+	.	1
<i>Digitalis purpurea</i>	.	.	.	+	+	.	+	.	.	.
<i>Lavandula sampaijana</i>	.	.	.	+	.	+	.	.	.	.
<i>Pinus pinaster</i>	.	.	.	.	.	.	+	.	.	.

Other companion species: 1 *Ficus carica*, + *Digitalis amandiana*, + *Cytisus striatus*, + *Cytisus scoparius*, + *Cistus salvifolius*, + *Silene marizii*, + *Malva tournefortiana*, + *Thapsia villosa*, + *Arrhenatherum elatius*, + *Ferula communis*, + *Sanguisorba verrucosa*, + *Sedum hirsutum*, + *Jasione montana*, + *Campanula lusitanica*, + *Anarrhinum duriminium* in 1; + *Solanum chenopodioides* in 2; + *Lamium maculatum* in 3; + *Rumex papillaris* in 4; + *Celtis australis*, + *Conopodium capillifolium* in 6; + *Umbilicus rupestris* in 7; + *Rumex acetosa* in 9

Localities: 1: Tua river nearby S. Lourenço (Pombal, Carrazeda de Ansiães), 2: between Vila Seca and Santo Adrião (Coura, Armamar); 3* (*holotypus ass.*), 4, 5, 6, 7: between Lamego and Balsemão (Lamego); 8* (*holotypus subass.*), 9, 10: Vila Cova de Alva (Arganil)

Euphorbio paraliae-Lotetum floridi Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito Santo & Lousã 2003 corr. Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito Santo & Lousã hoc loco (63.3.1.)

[≡*Euphorbio paraliae-Lotetum glauci* Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito Santo & Lousã 2003]

(*Euphorbio paraliae-Lotion floridi*, *Zygophyllo fontanesii-Polycarpaetalia nivea*, *Polycarpaeo niveae-Traganetea moquini*)

Taxonomic correction: *Lotus glaucus* subsp. *glaucus* should be *Lotus glaucus* subsp. *floridus*.

[JARDIM, SEQUEIRA, CAPELO, AGUIAR, J.C. COSTA, ESPÍRITO SANTO & LOUSÃ]

Euphorbio paraliae-Lotion floridi Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito Santo & Lousã 2003 corr. Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito Santo & Lousã hoc loco (63.3.)

[≡*Euphorbio paraliae-Lotion glauci* Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito Santo & Lousã 2003]

(*Zygophyllo fontanesii-Polycarpaetalia nivea*, *Polycarpaeo niveae-Traganetea moquini*)

Taxonomic correction: *Lotus glaucus* subsp. *glaucus* should be *Lotus glaucus* subsp. *floridus*.

[JARDIM, SEQUEIRA, CAPELO, AGUIAR, J.C. COSTA, ESPÍRITO SANTO & LOUSÃ]

Festucetum francoi Lüpnitz 1976 corr. Fernández-Prieto, Aguiar, J.C. Costa, Lousã & Rivas-Martínez corr. hoc loco (48.1.2.)

[≡*Euphorbio paraliae-Lotion glauci* Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito Santo & Lousã 2003]

(*Festucion jubatae*, *Nardentalia strictae*, *Nardetalia strictae*, *Nardetea*)

[≡*Festucetum jubatae* Lüpnitz 1976]

The taxon that occurs in the Azores is *Festuca francoi* not *Festuca jubata*.

[FERNÁNDEZ-PRIETO, AGUIAR, J.C. COSTA, LOUSÃ & RIVAS-MARTÍNEZ]

Festucion francoi Lüpnitz 1976 corr. Fernández-Prieto, Aguiar, J.C. Costa, Lousã & Rivas-Martínez corr. hoc loco (48.1.)

[≡ *Festucion jubatae* Lüpnitz 1976]

(*Nardentalia strictae*, *Nardetalia strictae*, *Nardetea*)

The taxon that occurs in the Azores is *Festuca francoi* not *Festuca jubata*.

[FERNÁNDEZ-PRIETO, AGUIAR, J.C. COSTA, LOUSÃ & RIVAS-MARTÍNEZ]

Fraxino angustifoliae-Aceretum monspessulani Monteiro-Henriques, J.C. Costa, A. Bellu & Aguiar ass. nova hoc loco (60.4.1.)

(*Aceri granatensis-Quercion fagineae*, *Quercetalia pubescenti-petraeae*, *Quercu-Fagetea*)

Diagnosis: Deciduous/marcescent, mesophilous, micro to mesoforest, mesomediterranean, humid, euoceanic, mesotrophic in Lusitanian-Duriensean territories. It occupies colluvial soils (derived from schists) on shadowy generally steep slopes, with soil's moisture during all year, but never hygrophilous. Dominated by *Acer monspessulanum* and/or *Fraxinus angustifolia*, with high *Quercus faginea* subsp. *faginea* cover (Table 12, *holotypus* relevé no. 3). Apart the *Quercu-Fagetea*'s species (*Hedera hibernica*, *Quercus robur* subsp. *broteroana*, *Castanea sativa*, *Quercus x duriensis* [= *Quercus broteroana* x *Quercus faginea*], *Teucrium scorodonia*, *Prunus avium*, *Euphorbia amygdaloides*, *Polygonatum odoratum*, *Arenaria montana*, *Melica uniflora*, *Crepis lampsanoides*, *Corylus avellana*, *Silene nutans*, *Sorbus latifolia*, etc.), other plants, characteristic of the *Quercetea ilicis*, are also frequent, like: *Arbutus unedo*, *Pistacia terebinthus*, *Ruscus aculeatus*, *Laurus nobilis*, *Osyris alba*, *Rubia peregrina*, *Phillyrea angustifolia*; as well *Rhamno-Prunetea* species (*Crataegus monogyna*, *Rubus ulmifolius*, *Lonicera hispanica*, *Tamus communis*, *Rosa canina*, *Sambucus nigra*, *Bryonia dioica*, *Prunus spinosa*), and *Trifolio-Geraniea* species (*Linaria triornithophora*, *Sedum forsterianum*, *Origanum virens*, *Brachypodium sylvaticum*, *Clinopodium arundanum*, *Silene nutans*, *Arabis stenocarpa*, etc.). It contacts with *Physospermo cornubiensis-Quercetum suberis* and *Clematido campaniflorae-Celtidetum australis*.

A new subassociation *prunetosum lusitanicae* subass. nova hoc loco is present along the Alva river basin, on shadowy, north-exposed hillsides, in Littoral Beirensean. The differential species are: *Prunus lusitanica*, *Viburnum tinus*, *Phillyrea latifolia* and *Phillyrea media* (Table 12, *holotypus* relevé no. 8). In this one there is a lack of *Quercus faginea* and enrichment of *Quercus broteroana* and *Laurus nobilis*. It contacts with *Viburno tini-Quercetum roboris*.

[MONTEIRO-HENRIQUES, J.C. COSTA, A. BELLU & AGUIAR]

Genisto falcatae-Adenocarpum lainzii Antunes, Capelo, J.C. Costa & Lousã in Costa, Capelo, Lousã, Antunes, Aguiar, Izco & Ladero 2000 corr. Antunes, Pinto-Gomes & J.C. Costa hoc loco (52.4.4.)

[≡ *Genisto falcatae-Adenocarpum anisochili* Antunes, Capelo, J.C. Costa & Lousã in Costa, Capelo, Lousã, Antunes, Aguiar, Izco & Ladero 2000]

(*Cytisetea scopario-striati*, *Cytisetalia scopario-striati*, *Ulici europaei-Cytision striati*)

Taxonomic correction: *Adenocarpus anisochilus* should be *Adenocarpus lainzii*.

[CASTRO ANTUNES, CAPELO, PINTO-GOMES & J.C. COSTA]

Gennario diphyllae-Euphorbietum piscatoriae Jardim, Capelo, Sequeira, Aguiar & J.C. Costa ass. nova hoc loco (62.1.2.)

(*Rhamno crenulatae-Oleetea cerasiformis*, *Rhamno crenulatae-Oleetalia cerasiformis*, *Mayteno umbellatae-Oleion maderensis*)

Diagnosis: Nanophanerophytic Mediterranean xeric-oceanic, inframediterranean, semiarid, euhyperoceanic community, on the basaltic substrate of Porto Santo Island. Dominated by *Euphorbia piscatoria* accompanied by *Phagnalon lowei*, *Plantago maderensis*, *Gennaria diphylla*, *Crambe fruticosa*, *Helichrysum melaleucum*, *Micromeria thymoides*, *Hyparrhenia sinaica*, etc. (Table 13, *holotypus* relevé no. 2).

Table 13

62.1.2. **Gennario diphyllae-Euphorbietum piscatoriae**
ass. nova hoc loco

Altitude (m)	55	390	330	350
Orientation	S	SW	E	NE
Surface (m ²)	16	50	50	50
N° of species	5	7	13	14
Ordinal number	1	2*	3	4

Characteristic species

<i>Euphorbia piscatoria</i>	5	5	3	4
<i>Phagnalon lowei</i>	2	1	2	3
<i>Gennaria diphylla</i>	+	+	+	+
<i>Plantago maderensis</i>	.	+	1	1
<i>Crambe fruticosa</i>	.	+	1	1
<i>Micromeria thymoides</i>	.	.	1	1
<i>Erica maderincola</i>	.	.	.	2
<i>Helichrysum melaleucum</i>	.	.	.	1

Companion species

<i>Hyparrhenia sinaica</i>	1	2	1	2
<i>Opuntia tuna</i>	.	1	2	2
<i>Pteridium aquilinum</i>	.	.	2	2
<i>Carpobrotus edulis</i>	.	.	2	2
<i>Piptatherum miliaceum</i>	.	.	1	1
<i>Calamintha nepeta</i>	.	.	+	+

Other companion species: + *Astragalus boeticus* in 1; + *Ageratina adenophora* in 3

Localities: Porto Santo Island: 1: Pico de Ana Ferreira; 2* (*holotypus*): Pico do Castelo; 3, 4: Chão da Farinha

[JARDIM, CAPELO, SEQUEIRA, AGUIAR & J.C. COSTA]

Globulario salicinae-Ericetum canariensis Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 corr. Capelo, J.C. Costa, Lousã, Jardim, Sequeira & Rivas-Martínez hoc loco (64.1.1.)

[≡ *Globulario salicinae-Ericetum arborea* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000]

(*Myrico fayae-Ericion canariensis*, *Andryalo-Ericetalia*, *Pruno hixae-Lauretea novocanariensis*)

Taxonomic correction: *Erica arborea* should be *Erica canariensis*.

[CAPELO, J.C. COSTA, LOUSÃ, JARDIM, SEQUEIRA & RIVAS-MARTÍNEZ]

Hedero hibernicae-Quercetum fagineae Monteiro-Henriques, J.C. Costa, A. Bellu & Aguiar ass. nova hoc loco (60.4.2.)

(*Aceri granatensis-Quercion fagineae*, *Quercetalia pubescenti-petraeae*, *Quercu-Fagetia*)

Diagnosis: Climactic, marcescent, mesophilous mesoforest, dominated by *Quercus faginea* subsp. *faginea* (Table 14, *holotypus* relevé no. 5). The underwood is characterized by *Quercetea ilicis*' species, as *Arbutus unedo*, *Rubia peregrina*, *Daphne gnidium*, *Osyris alba*, *Pistacia terebinthus*, *Phillyrea angustifolia*, *Lonicera etrusca*, *Asparagus acutifolius* etc., by *Quercu-Fagetia*'s species (*Hedera hibernica*, *Teucrium scorodonia*, *Castanea sativa*, *Prunus avium*, *Quercus pyrenaica*, *Euphorbia amygdaloides*, *Cephalanthera longifolia*, *Melica uniflora*, *Luzula forsteri*, *Arenaria montana*, *Epipactis duriensis*), *Rhamno-Prunetea*' species (*Crataegus monogyna*, *Rubus ulmifolius*, *Tamus communis*, *Lonicera hispanica*, *Rosa canina*, *Bryonia dioica*, *Aristolochia paucinervis*, *Sambucus nigra*, *Prunus insititia*, *Prunus spinosa*), and *Trifolio-Geranietea*' species (*Brachypodium sylvaticum*, *Silene nutans*, *Ranunculus ollisiponensis*, *Origanum virens*, *Lathyrus clymenum*, *Clinopodium arundanum*, *Silene latifolia*, *Arabis stenocarpa*). The climactic domain of this forest probably corresponds to the Lusitanian-Duriensean richer zones, as to base and carbonate content, of the Douro Group cambric metasediments. It occurs in mesomediterranean, humid to subhumid, euoceanic to semicontinental, on deep mesotrophic soils, and contacts with *Physosermo cornubiensis-Quercetum suberis*' forests where the metasediments base (and / or carbonate) tenor diminishes. Its coenotope is almost entirely occupied by crops (vineyards, orchards, etc.).

[MONTEIRO-HENRIQUES, J.C. COSTA, A. BELLU & AGUIAR]

Hyperico elodis-Rhynchosporium modesti-lucennoi Neto, Capelo, J.C. Costa & Lousã in Neto 1997 corr. Neto, Capelo, J.C. Costa & Lousã hoc loco (9.2.4.)

[≡ *Hyperico elodis-Rhynchosporium rugosae* Neto, Capelo, J.C. Costa & Lousã in Neto 1997]

(*Isoeto-Littorelletea*, *Littorelletalia*, *Eleocharition multicaulis*)

Taxonomic correction: *Rhynchospora rugosa* should be *Rhynchospora modesti-lucennoi*.

[NETO, CAPELO, J.C. COSTA & LOUSÃ]

Irido foetidissimae-Fraxinetum angustifoliae (Pinto-Gomes & Cano 1998) Portela-Pereira, J.C. Costa, Neto, Monteiro-Henriques & Pinto-Gomes st. nov. hoc loco (56.1.9.)

(*Salici purpureae-Populetea nigrae*, *Populetales albae*, *Populion albae*, *Fraxino angustifoliae-Ulmenion minoris*)

Basion.: *Ficario ranunculoidis-Fraxinetum angustifoliae quercetosum broteroi* Pinto-Gomes & Cano in A. Garcia, Torres, Pinto-Gomes, Leite, Salazar, Melendo, J. Nieto & Cano 1998.

Table 14
60.4.2. *Hedero hibernicae-Quercetum fagineae* ass. nova hoc loco

Altitude (m)	107	296	368	159	159	271	346	412	271	600	600
Aspect	N	E	W	SE	NE	SE	SE	W	SE	N	W
Area (m ²)	100	100	100	200	180	40	80	200	40	50	50
Slope (g)	60	45	50	20	50	5	60	40	5	25	30
Total coverage (%)	100	100	100	100	100	100	100	95	100	95	95
Taxa no.	15	17	35	30	21	25	23	36	17	32	29
Ordinal number	1	2	3	4	5*	6	7	8	9	10	11
Characteristics species											
<i>Quercus faginea</i>	3	4	3	4	5	5	4	4	3	4	4
<i>Crataegus monogyna</i>	.	.	+	3	1	1	+	2	1	1	+
<i>Arbutus unedo</i>	.	3	+	2	+	3	3	2	2	.	.
<i>Tamus communis</i>	+	2	+	1	3	+	+	.	.	1	.
<i>Hedera hibernica</i>	+	1	2	1	3	1	.	.	1	1	+
<i>Lonicera etrusca</i>	+	.	1	+	.	1	.	.	.	1	+
<i>Lonicera hispanica</i>	.	.	.	.	.	2	.	1	.	2	+
<i>Sedum forsterianum</i>	.	.	+	+	.	.	.	.	.	+	+
<i>Brachypodium sylvaticum</i>	.	1	.	.	1	.	.	.	.	1	.
<i>Laurus nobilis</i>	.	.	1	.	+	.	+	.	.	.	.
<i>Silene nutans</i>	+	.	.	1	.	.	.	.	.	.	+
<i>Hypericum perforatum</i>	.	.	.	.	.	+	.	.	.	+	+
<i>Quercus faginea</i> (frut.)	.	.	.	.	1	2	.	.	.	.	.
<i>Aristolochia paucinervis</i>	.	.	.	.	.	.	.	2	.	1	.
<i>Clinopodium arundanum</i>	.	.	.	.	.	.	.	.	.	1	1
<i>Prunus avium</i>	.	.	.	.	1	.	.	.	.	+	.
<i>Castanea sativa</i>	.	.	1	.	.	+	.	.	.	.	.
<i>Rosa canina</i>	.	.	1	.	.	.	+	.	.	.	.
<i>Teucrium scorodonia</i>	.	1	+	.	.	.	.	.	.	.	.
<i>Rosa micrantha</i>	.	.	.	.	.	.	.	.	.	+	1
<i>Paeonia broteroi</i>	.	.	.	.	.	.	.	.	.	1	+
<i>Bryonia dioica</i>	.	.	.	.	.	.	+	+	.	.	.
<i>Ranunculus ollissiponensis</i>	+	.	+	.	.	.	.	.	.	.	.
<i>Luzula forsteri</i>	.	.	+	.	.	.	.	.	.	.	+
<i>Cephalanthera longifolia</i>	.	+	.	.	.	.	.	.	.	.	+
<i>Quercus pyrenaica</i>	.	.	.	.	.	.	.	3	.	.	.
<i>Galium mollugo</i>	.	.	.	.	.	.	.	2	.	.	.
<i>Lathyrus clymenum</i>	.	.	.	1	.	.	.	.	.	.	.
<i>Prunus spinosa</i>	.	.	.	.	.	.	.	.	.	1	.
<i>Prunus insititia</i>	.	.	.	.	.	.	.	1	.	.	.
<i>Origanum virens</i>	.	.	.	.	.	.	.	1	.	.	.
<i>Arenaria montana</i>	.	.	+	.	.	.	.	.	.	.	.
<i>Euphorbia amygdaloides</i>	.	+	.	.	.	.	.	.	.	.	.
<i>Melica uniflora</i>	.	.	.	.	.	.	+	.	.	.	.
<i>Sambucus nigra</i>	.	.	.	.	.	.	+	.	.	.	.
<i>Arabis stenocarpa</i>	.	.	+	.	.	.	.	.	.	.	.
<i>Calamintha baetica</i>	.	.	.	.	.	.	.	+	.	.	.
<i>Silene latifolia</i>	.	.	.	.	.	.	.	+	.	.	.
<i>Epipactis duriensis</i>	.	.	.	.	.	.	.	.	.	+	.
<i>Geum sylvaticum</i>	.	.	.	.	.	.	.	.	.	+	.
<i>Amelanchier ovalis</i>	.	.	.	.	.	.	.	.	.	.	+
Characteristics of <i>Quercetea ilicis</i>											
<i>Rubia peregrina</i>	+	3	1	1	3	3	+	1	1	2	1
<i>Daphne gnidium</i>	.	1	+	1	+	+	+	1	+	+	1
<i>Osyris alba</i>	.	1	1	4	+	+	+	.	1	.	1
<i>Quercus rotundifolia</i>	+	.	2	.	.	+	+	.	2	2	2
<i>Erica arborea</i>	+	1	1	+	.	.	1	+	.	+	.
<i>Asplenium onopteris</i>	2	1	2	.	2	.	+	.	.	+	.
<i>Phillyrea angustifolia</i>	.	.	.	1	1	.	2	.	+	.	2
<i>Pistacia terebinthus</i>	2	1	1	.	.	.	+	.	2	.	.
<i>Asparagus acutifolius</i>	.	.	.	2	+	1	.	.	1	.	.
<i>Ruscus aculeatus</i>	.	3	3	.	.	.	.	.	.	+	+
<i>Asparagus aphyllus</i>	.	.	.	1	.	.	+	.	.	.	.
<i>Olea sylvestris</i>	+	.	.	+	.	.	.	.	.	.	.
Companion species											
<i>Rubus ulmifolius</i>	.	.	2	+	3	+	2	2	2	+	.
<i>Geranium purpureum</i>	1	.	+	+	1	.	.	+	.	.	+
<i>Cistus salviifolius</i>	+	.	+	+	.	+	.	2	.	.	.

<i>Cytisus grandiflorus</i>	.	.	.	2	.	1	.	2	+	.	.
<i>Rhus coriaria</i>	.	.	.	2	+	3	.	.	3	.	.
<i>Cytisus scoparius</i>	.	.	.	.	.	.	.	1	.	1	1
<i>Genista falcata</i>	.	.	+	.	.	.	.	.	.	1	1
<i>Melica ciliata magnolii</i>	.	1	.	+	.	.	.	2	.	.	.
<i>Dactylis hispanica</i>	.	.	.	1	.	+	.	.	.	1	.
<i>Cytisus striatus</i>	.	.	+	.	.	1	.	.	+	.	.
<i>Pteridium aquilinum</i>	.	.	+	.	+	1	.	.	.	.	.
<i>Lavandula sampaioana</i>	.	.	.	+	.	.	.	1	.	.	+
<i>Sanguisorba verrucosa</i>	.	+	+	.	.	.	.	+	.	.	.
<i>Thapsia villosa</i>	.	.	+	.	+	.	.	+	.	.	.
<i>Scrophularia scorodonia</i>	.	.	.	.	.	.	+	1	.	.	.
<i>Festuca elegans</i>	.	.	.	.	.	.	.	.	.	+	1
<i>Geranium lucidum</i>	.	.	.	.	.	.	.	.	.	1	1
<i>Bromus sterilis</i>	.	.	.	.	.	.	.	.	.	1	+
<i>Cynosurus cristatus</i>	.	.	.	+	.	.	.	.	.	1	.
<i>Anogramma leptophylla</i>	.	.	.	.	+	.	.	+	.	.	.
<i>Antirrhinum graniticum</i>	.	.	.	+	.	+	.	.	.	.	.
<i>Asplenium quadrivalens</i>	.	.	.	.	.	.	+	+	.	.	.
<i>Conopodium marizianum</i>	.	.	+	.	.	.	.	.	.	.	+
<i>Polypodium cambricum</i>	.	.	+	.	.	.	+	.	.	.	.

Other characteristics of *Quercetea ilicis*: 1 *Viburnum tinus* in 1; + *Arum italicum* subsp. *neglectum* in 3; + *Hyacinthoides hispanica* in 4; + *Arisarum simorrhinum* in 7. **Other companion species:** + *Asplenium ruta-muraria* in 3; 1 *Arrhenatherum elatius* subsp. *bulbosum*, + *Brachypodium distachyon* in 4; 1 *Pinus pinaster*, + *Conyza canadensis* in 6; 2 *Ferula communis*, 2 *Lamium maculatum*, 1 *Brachypodium phoenicoides*, + *Agrostemma githago*, + *Anarrhinum bellidifolium*, + *Centranthus calcitrapae*, + *Coincya monensis* subsp. *cheiranthos*, + *Coleostephus myconis*, + *Crucianella angustifolia* in 8; + *Celtis australis*, + *Cynodon dactylon* in 9; + *Filipendula vulgaris* in 10; 1 *Cistus ladanifer* in 11

Localities: 1: near Régua dam (Parada do Bispo, Lamego); 2: near Varosa dam (Almacave, Lamego); 3: between Lamego and Balsemão (Sé, Lamego); 4, 5* (*holotypus*): between Adega do Chão and Varosa mouth river (Cambres, Lamego); 6, 9: Almacave, Balsemão mouth river (Lamego); 7: between Lamego and Santa Comba (Almacave, Lamego); 8: nearby Varosa dam, Picoto (Sé, Lamego); 10: near Igrejas river (Vale da Lama, Bragança); 11: near Sabor river (Vale da Lama, Bragança)

Climatic, temporihygrophilous, deciduous micro to mesoforest of *Fraxinus angustifolia* with *Quercus broteroi*, *Arum italicum*, *Vinca difformis*, *Bupleurum fruticosum*, *Rosa sempervirens*, *Iris foetidissima*, *Cheirolophus sempervirens*, *Ranunculus ficaria*, etc. It occurs on clayish fluvisols derived from limestones and marls, in thermo to lower mesomediterranean subhumid to humid oceanic bioclimate, in Coastal Lusitanian-Andalusian and Lusitanian-Extremadurean areas (see García et al. 1998).

Holotypus: relevé no. 7 table 3 García et al. (1998), pp. 305-306: Zimbral, Amendoeira, 100 m, W, 90%, 400 m²: Characteristic species: 4.5 *Fraxinus angustifolia*, 2.2 *Quercus broteroi*, 2.2 *Bupleurum fruticosum*, +2 *Iris foetidissima*, 1.2 *Cheirolophus sempervirens*, 1.1 *Arum italicum*, +.2 *Rubus ulmifolius*, +.2 *Vinca difformis*, + *Rosa sempervirens*, + *Ranunculus ficaria*, + *Crataegus monogyna*, 1.1 *Tamus communis*; Companion species: + *Oenanthe crocata*, + *Rhamnus alaternus*, 2.2 *Smilax aspera*, 1.1 *Piptatherum miliaceum*, + *Viburnum tinus*, 1.1 *Ceratonía siliqua*, + *Lonicera implexa*, + *Phillyrea latifolia*, + *Pistacia lentiscus*, 1.1 *Carex acuta*, 1.1 *Arisarum simorrhinum*, + *Euphorbia characias*.

[PORTELA-PEREIRA, J.C. COSTA, NETO, MONTEIRO-HENRIQUES & PINTO-GOMES]

Limonietum lowei Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito-Santo & Lousã 2003 corr. Capelo, J.C. Costa, Jardim & Sequeira hoc loco (17.4.3.)

[= *Limonietum pyramidati* Jardim, Sequeira, Capelo, Aguiar, J.C. Costa, Espírito-Santo & Lousã 2003]

(*Crithmo baritimi-Limonietea*, *Crithmo maritimi-Limonietalia*, *Helichryson obconico-devium*)

Taxonomic correction: *Limonium ovalifolium* subsp. *pyramidatum* should be *Limonium lowei*.

[CAPELO, J.C. COSTA, JARDIM & SEQUEIRA]

Limonium algarvensi-lanceolati J.C. Costa, Neto, Monteiro-Henriques, Arsénio, Portela-Pereira, Caperta & Izco all. nova hoc loco (20.5.)

(*Sarcocornietea fruticosae*, *Limonietales*)

Typus allianceae: *Limonietum lanceolati* Arsénio, J.C. Costa & Neto in Neto, Arsénio & J.C. Costa 2009.

Diagnosis: Alliance is formed by halophilous thermomediterranean Coastal Lusitanian-Andalusian communities, with rosulate and prostrate chamaephytes that colonize the upper tideland of salt marshes reached by the sea water only during the highest tides. The atlantic species *Frankenia laevis*, *Limonium ovalifolium* are the differential species to the other alliances of the order *Limonietales*, on the other hand *Myriolimon ferulaceum*, *Triglochin barrelieri*, *Artemisia gallica*, *Polygonum equisetiforme*, *Puccinellia iberica*, *Limoniastrum monopetalum* and *Suaeda vera* are the differential species to Cantabrian-Atlantic alliance *Limonio ovalifolii-Frankenia laevis* (*Glauco-Puccinellietalia*, *Juncetea maritima*).

Characteristic species: *Limonium algarvense*, *Limonium daveaui*, *Limonium lanceolatum*, *Myriolimon diffusum* (= *Limonium diffusum*).

Inulo crithmoidis-Myriolimetum ferulacei Rivas-Martínez & Costa in Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980 nom. mut. prop. (20.5.1.)

[*Inulo crithmoidis-Limonietum ferulacei* Rivas-Martínez, Costa, Castroviejo & E. Valdés 1980]

Limonietum daveaui J.C. Costa, Caperta & Neto ass. nova hoc loco (20.5.2.)

Diagnosis: In the Tagus river as been found a community dominated by the rosulate and prostrate chamaephyte *Limonium daveaui*, with *Halimione portulacoides*, *Artemisia gallica*, *Frankenia laevis*, *Juncus maritimus*, *Juncus acutus* etc. (Table 15, *holotypus* relevé no. 12). This phytocoenosis occurs on sandy well-drained soils, inundated only during the highest tides, under the thermomediterranean sub-humid bioclimate. It usually occupies the edges of *Polygonum equisetiformis*-*Juncetum maritimi* and *Cistancho phelypaeae*-*Suaedetum verae* at the higher topographic positions. Its area of distribution is restricted to the salt marshes of the Tagus estuary, in the Sadensean District, Coastal Lusitanian-Andalusian Province, being the most northern association of the alliance *Limonium algarvensi-lanceolati*.

Limonietum lanceolati Arsénio, J.C. Costa & Neto in Neto, Arsénio & J.C. Costa 2009 (20.5.3.)

Myriolimo diffusi-*Limonietum algarvensis* J.C. Costa, Neto & Caperta ass. nova hoc loco (20.5.4.)

Diagnosis: Community dominated by the chamaephytes *Myriolimo diffusum* and *Limonium algarvensis* found in the Algarve, here designated as *Myriolimo diffusi*-*Limonietum algarvensis* (Table 16, *holotypus* relevé no. 3). This phytocoenosis occurs in sandy well-drained soils, inundated only during the highest tides, under the thermomediterranean dry bioclimate. It occupies relatively lower positions than the association *Polygonum equisetiformis*-*Limonietum monopetalum* association, usually occurring between this last one and *Cistancho phelypaeae*-*Suaedetum verae*. Although *Myriolimo diffusi*-*Limonietum algarvensis* resembles the *Inulo crithmoidis*-

Myriolimo ferulacei association, its ecology is quite distinct as the latter occurs on clayey or silty soils and the first is confined to sandy soils. Its known area of distribution, so far, is restricted to the salt marshes of the Algarve, in the Algarvian District, Coastal Lusitanian-Andalusian Province.

[J.C. COSTA, NETO, MONTEIRO-HENRIQUES, ARSÉNIO, PORTELA-PEREIRA, CAPERTA & IZCO]

Loto macranthi-Phagnaletum lowei Jardim, Capelo, Sequeira, Aguiar & J.C. Costa ass. nova hoc loco (62.2.3.)

(*Rhamno crenulatae*-*Oleetea cerasiformis*, *Micromeria hyssopifoliae*-*Cistetalia monspeliensis*, *Soncho ustulati*-*Artemision argenteae*)

Diagnosis: Chamaephytic community, constituted by *Phagnalon lowei*, *Micromeria thymoides*, *Lotus macranthus*, *Plantago maderensis*, *Crambe fruticosa*, etc. (Table 17, *holotypus* relevé nº 6). It is subserial of the *Gennario diphyllae*-*Euphorbietum piscatoriae*. It occurs in Mediterranean xeric-oceanic, inframediterranean, semiarid, euhyperoceanic, on basaltic leptosols at low altitudes in the island of Porto Santo.

[JARDIM, CAPELO, SEQUEIRA, AGUIAR & J.C. COSTA]

Loto salvagensis-Elytrigietum junceae Pérez de Paz & Acebes ex J.C. Costa, Jardim, Capelo, Sequeira, & Lousã ass. nova hoc loco (63.2.1.)

[Community of *Agropyron junceiforme* Pérez de Paz & Acebes 1983]

(*Polycarpaeo niveae*-*Euphorbion paraliae*, *Zygophyllo fontanesii*-*Polycarpaetalia nivea*, *Polycarpaeo niveae*-*Traganetea moquini*)

Table 15

20.5.2. *Limonietum daveaui* ass. nova hoc loco

Surface (m ²)	6	4	8	4	4	4	8	6	8	4	4	4
Number of species	8	5	10	9	4	5	11	12	12	7	8	6
Ordinal number	1	2	3	4	5	6	7	8	9	10	11	12*
Characteristic species												
<i>Limonium daveaui</i>	4	4	3	3	3	3	3	3	2	3	3	4
<i>Halimione portulacoides</i>	.	.	1	+	1	1	+	2	+	1	3	+
<i>Artemisia gallica</i>	1	1	1	1	.	.	1	+	+	1	+	.
<i>Frankenia laevis</i>	.	2	3	1	3	2	+	2	.	.	.	.
<i>Suaeda vera</i>	.	.	.	.	.	.	+	+	+	1	.	.
<i>Inula crithmoides</i>	.	.	.	.	.	.	.	+	1	.	.	.
<i>Limonium ferulaceum</i>	.	+	.	.	.	.	+	.	.	.	.	.
<i>Triglochin barrelieri</i>	.	.	.	.	.	.	+	+	.	.	.	.
<i>Polygonum equisetiforme</i>	.	.	.	.	.	.	.	+	.	.	.	.
Companions species												
<i>Juncus maritimus</i>	2	.	2	3	2	2	.	.	+	.	2	.
<i>Plantago coronopus</i>	.	+	+	.	.	+	+	+	+	+	.	.
<i>Polypogon maritimus</i>	2	.	.	.	.	.	+	+	+	+	1	+
<i>Hordeum marinum</i>	1	.	.	.	.	.	+	+	+	.	+	+
<i>Juncus acutus</i>	+	.	1	2	.	.	.	.	+	.	1	.
<i>Suaeda albescens</i>	.	.	.	.	.	.	+	.	+	+	.	2
<i>Carpobrotus edulis</i>	.	.	1	1	.	.	.	.	.	.	1	.
<i>Bromus hordeaceus</i>	2	.	+	.	.	.	.	.	.	.	.	.
<i>Dittrichia viscosa</i>	.	.	+	1	.	.	.	.	.	.	.	.
<i>Parapholis filiformis</i>	.	.	.	.	.	.	+	.	.	.	.	+

Other companion species: 1 *Torilis arvensis* in 1; + *Aetheorhiza bulbosa* in 4; + *Armeria pungens* in 9

Localities: 1, 2, 3, 4 5, 6, 11: Coina, Seixal; 7: Seca do Bacalhau, Alcochete; 8, 10: Hortas, Alcochete; 9, 12* (*holotypus*): Samouco, Alcochete;

Table 16

20.5.4. *Myriolimo diffusum-Limonietum algarvensis* ass. nova hoc loco

Surface (m ²)	4	2	4	2	4	4	6	2	2	4	4	8	4	4	6	6	8	2	6
Nº of species	6	5	4	4	5	4	5	6	7	6	8	8	6	5	6	5	6	7	4
Ordinal number	1	2	3*	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Characteristic species																			
<i>Myriolimon diffusum</i>	3	1	2	1	2	2	2	3	3	1	1	2	3	3	3	1	1	+	+
<i>Limonium algarvense</i>	.	2	2	2	3	3	1	3	1	1	2	2	2	3	+	2	3	2	2
<i>Limoniastrum monoptalum</i>	.	.	.	.	.	.	.	.	+	+	+	+	1	+	+	+	+	+	.
<i>Suaeda vera</i>	.	.	.	+	+	+	+	+	+	+	+	+	.	.	.	.	.	+	.
<i>Frankenia laevis</i>	+	.	.	.	1	.	+	+	.	+	.	.	.	.	+	.	+	.	+
<i>Puccinellia iberica</i>	.	+	.	.	.	.	.	.	.	.	+	1	+	+	.	.	.	.	.
<i>Arthrocnemum macrostachyum</i>	.	+	.	.	.	.	.	.	.	.	+	.	+	.	.	+	.	.	.
<i>Limonium lanceolatum</i>	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	+
<i>Myriolimon ferulaceum</i>	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.
<i>Polygonum equisetiforme</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
<i>Inula crithmoides</i>	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.
Companions species																			
<i>Salsola vermiculata</i>	+	.	+	.	+	.	+	.	+	+	.	.	.	.	.	.	+	+	.
<i>Suaeda albescens</i>	+	1	+	+	.	.	.	.	1	.	.	1	.	.	.	.	.	1	.
<i>Sporobolus pungens</i>	1	.	.	.	.	.	.	1	.	.	1	.	+	.	.	2	.	2	.
<i>Parapholis filiformis</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.
<i>Spergularia salina</i>	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.
<i>Elymus elongatus</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.
<i>Spergularia salina</i>	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.
<i>Elymus elongatus</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.

Localities: 1, 3* (*holotypus*), 5, 6, 9, 17, 19: Forte do Rato (Tavira); 2, 4, 11, 13, 16: Torre de Bias (Olhão); 7: Cocos Islet (Olhão); 8: Torre de Aires (Tavira); 10, 18: between Manta Rota and Cacela (Vila Real de Stº António); 12: near Faro bridge (Faro); 14: Tavira Island; 15: Armona Island (Olhão),

Table 17

62.2.3. *Loto macranthi-Phagnaletum lowei* ass. nova hoc loco

Altitude (m)	100	25	20	30	150	120
Orientation	E	S	SW	N	SW	NE
Surface (m ²)	16	20	20	10	10	6
Nº of species	5	17	12	12	7	11
Ordinal number	1	2	3	4	5	6*
Characteristic species						
<i>Phagnalon lowei</i>	3	3	3	3	2	2
<i>Micromeria thymoides</i>	2	1	2	1	3	+
<i>Lotus macranthus</i>	.	.	.	1	+	+
<i>Plantago maderensis</i>	.	.	.	1	.	2
<i>Crambe fruticosa</i>	.	.	.	+	.	+
<i>Artemisia argentea</i>	.	.	.	.	2	.
<i>Carlina salicifolia</i>	.	.	.	.	1	.
<i>Globularia salicina</i>	.	.	+	.	.	.
Companion species						
<i>Crepis divaricata</i>	.	1	.	+	.	+
<i>Wahlenbergia lobelioides</i>	.	.	.	+	+	+
<i>Frankenia laevis</i> var. <i>hebecaulon</i>	.	2	2	.	.	.
<i>Andryala glandulosa</i>	.	.	.	1	.	2
<i>Asphodelus fistulosus</i>	.	1	.	+	.	.
<i>Orobanche minor</i>	.	+	.	.	.	1
<i>Polypodium macaronesicum</i>	.	.	.	+	.	1
<i>Brachypodium distachyon</i>	.	+	+	.	.	.

Other companion species: 2 *Erica madericola*, 1 *Carpobrotus edulis*, + *Pteridium aquilinum* in 1; 1 *Euphorbia terracina*, + *Lotus loweanus*, + *Stipa capensis*, + *Herniaria cinerea*, + *Linum strictum*, + *Hedypnois cretica*, + *Anagallis arvensis*, + *Salvia verbenaca*, + *Medicago polymorpha*, + *Hippocrepis multisiliquosa* in 2; 1 *Astragalus solandri*, 1 *Mesembryanthemum crystallinum*, + *Matthiola maderensis*, + *Medicago tornata*, + *Ajuga iva*, + *Biserrula pelecinus*, + *Centaurea melitensis* in 3; + *Tolpis succulenta*, + *Hyparrhenia sinaica* in 4; 2 *Nepeta calamintha* in 5; + *Davallia canariensis* in 6.

Localities: Porto Santo: 1: Chão da Farinha; 2, 4, 6* (*holotypus*): Pico Ana Ferreira; 3: Miradouro das Flores; 5: Pico Branco

Diagnosis: Perennial unstable grassland community, dominated by *Elytrigea juncea* subsp. *juncea*, accompanied by *Lotus glaucus* subsp. *salvagensis*, *Lobularia canariensis* subsp. *rosula-venti*, *Frankenia laevis* var. *hebecaulon*, etc. It occurs in the littoral mobile dunes in Selvagem Pequena, and contacts with the dwarf scrub stabilized dune community *Suaedo verae-Limonietum callibotryi*. It occurs in Mediterranean desertic-oceanic inframediterranean hyperearid bioclimate.

Holotypus releve nº 1 table 3 Pérez de Paz & Acebes (1983) p 246: Grande Piton, Selvagem Pequena, 6 m, 100 m², NE, 90% covering: characteristic species: 4.4 *Elytrigea juncea* subsp. *juncea*, +.1 *Lotus salvagensis*, +.1 *Lobularia canariensis* subsp. *rosula-venti*, companion species: 1.1 *Frankenia laevis* var. *hebecaulon*, 1.1 *Mesembryanthemum nodiflorum*, +.2 *Plantago aschersonii*.

[J.C. COSTA, JARDIM, CAPELO, SEQUEIRA, & LOUSÁ]

Minuartio juressi-Festucetum summilusitanae C. Meireles, Pinto-Gomes & J.C. Costa ass. nova hoc loco (39.3.4.)

[*Arenario querioidis-Festucetum summilusitanae* sensu auct. lus. non Rivas-Martínez, Sánchez-Mata & V. Fuente in Rivas-Martínez, Fernández-González & Sánchez-Mata 1986]

(*Festucetea indigestae, Jasiono sessiliflorae-Koelerietalia crassipedis, Hieracio castellani-Plantaginion radiatae*)

Diagnosis: Grassland shallow and well drained siliceous soils (e.g. ridges and steep slopes or rocky platforms), where brief snow accumulation. It is characterized by the dominance of *Festuca summilusitana* subsp. *summilusitana* accompanied by *Arenaria querioides*, *Minuartia recurva* subsp. *juressi*, *Hieracium castellanum*, *Agrostis truncatula* subsp. *commista*, *Sedum brevifolium*, *Jasione sessiliflora*, *Jasione crispa* subsp. *centralis*, *Silene elegans*, *Hieracium myriadenum*, *Avenella flexuosa* subsp. *iberica*, *Koeleria caudata* subsp. *crassipes*, etc. (Table 18, *holotypus* relevé nº 5). Geovarious of *Arenario querioidis-Festucetum gredensis*, with the presence of the differential species *Festuca summilusitana* subsp. *summilusitana*, *Minuartia recurva* subsp. *juressi*, *Phalacrocarpon oppositifolium* and with the absence of *Festuca summilusitana* subsp. *gredensis*, *Leucanthemopsis pallida*. It occurs in high altitudes of Serra da Estrela, in temperate-oceanic (submediterranean), supratemperate to orotemperate, hyperhumid bioclimate. It is subseral of *Lycopodium clavatum-Juniperetum nanae*.

[C. MEIRELES, PINTO-GOMES & J.C. COSTA]

Table 18

39.3.4. *Minuartio juressi-Festucetum summilusitanae* ass. nova hoc loco

Altitude (1=10m)	185	167	184	185	195	160	165	160	120
Orientation	E	S	N	NE	W	W	NW	S	W
Surface (m ²)	10	2	3	3	2	2	10	4	3
Nº of species	9	9	10	9	7	8	9	10	10
Ordinal number	1	2	3	4	5*	6	7	8	9
Characteristic species									
<i>Festuca summilusitana</i>	3	4	4	4	4	5	4	4	4
<i>Arenaria querioides</i>	1	+	.	+	+	+	1	+	1
<i>Minuartia juressi</i>	+	+	1	+	1	.	.	.	.
<i>Jasione sessiliflora</i>	.	1	+	.	.	.	1	+	.
<i>Hieracium castellanum</i>	.	.	2	+	.	+	.	.	.
<i>Agrostis commista</i>	+	1	+	.	.	+	.	.	.
<i>Jasione centralis</i>	1	.	+	+	.	.	.	.	.
<i>Phalacrocarpum oppositifolium</i>	.	+	.	+	.	.	.	+	.
<i>Plantago radicata</i>	.	.	+	.	1	.	.	.	.
<i>Silene elegans</i>	1	.	.	.	.	.	.	.	.
<i>Hieracium myriadenum</i>	1	.	.	.	.	.	.	.	.
<i>Koeleria crassipes</i>	.	.	.	.	.	.	.	1	.
Companion species									
<i>Sedum brevifolium</i>	2	1	1	1	1	1	+	.	2
<i>Avenella iberica</i>	+	.	.	1	2	.	+	.	.
<i>Dianthus lusitanicus</i>	.	2	.	.	.	.	1	1	.
<i>Rumex angiocarpus</i>	.	.	.	.	.	1	.	1	+
<i>Sedum hirsutum</i>	.	+	.	.	.	.	.	+	1
<i>Hypochoeris radicata</i>	.	.	.	+	.	.	+	.	+
<i>Gagea nevadensis</i>	.	.	.	.	.	.	1	.	1
<i>Paronychia polygonifolia</i>	.	.	+	.	+	.	.	.	.

Other companion species: + *Hieracium schmidtii* + *Poa bulbosa* in 3; 1 *Ranunculus nigrescens*, + *Cytisus oromediterraneus* in 6; + *Narcissus asturiensis* in 7; + *Teucrium salviastrum*, + *Viola riviniana* in 8; + *Umbilicus rupestris* in 9

Localities: 1: Covão do Boi (Unhais da Serra, Covilhã); 2: Near Lagoa do Peixão (Louriga, Seia) 3, 4: Near Senhora da Estrela (Unhais da Serra, Covilhã); 5* (*holotypus*): Depression of Cântaro Raso (Unhais da Serra, Covilhã); 6: Close to the cable car station (Cortes do Meio, Covilhã); 7: Near Poios Brancos (Seia); 8: Nave de Santo António (Unhais da Serra, Covilhã); 9: Alto dos Livros (Covilhã)

Murbeckiello sousae-Silenetum acutifoliae Honrado & P. Alves ass. nova hoc loco (24.2.1.)

(*Asplenietea trichomanis*, *Androsacetalia vandellii*, *Saxifragion willkommianae*)

Diagnosis: Plant community of rock fissures, endemic to the schist mountains of Northwest Portugal (Marão, Freita, S. Macário), dominated by *Silene acutifolia*, *Murbeckiella sousae*, *Festuca indigesta* and *Festuca summilusitana*. It occurs in temperate oceanic submediterranean, supratemperate humid to hyperhumid bioclimate.

Holotypus: Amarante: Serra do Marão, Rechã de Pousafigos, 980 m, E, 90°, 1 m²: Characteristic species: 3 *Silene acutifolia*, 2 *Murbeckiella sousae*, 1 *Sedum hirsutum*; Companion species: 1 *Festuca indigesta*, 1 *Sedum brevifolium*, 2 *Andreaea rothii*, 2 *Campylopus fragilis*.

[J. HONRADO & P. ALVES]

Omphalodo nitidae-Fraxinetum angustifoliae Monteiro-Henriques, J.C. Costa, A. Bellu, Aguiar & Portela-Pereira ass. nova hoc loco (56.1.12.)

(*Fraxino angustifoliae-Ulmenion minoris*, *Populion albae*, *Populetales albae*, *Salici purpureae-Populetea nigrae*)

Diagnosis: Climactic, temporihygrophilous, deciduous mesoforest, meso to thermotemperate, humid to hyperhumid, semihyperoceanic to euoceanic, in southern Galician-Portuguese, dominated by *Fraxinus angustifolia* subsp. *angustifolia*. Other occurring trees species are *Alnus glutinosa*, *Salix atrocinerea* and *Quercus robur* subsp. *broteroana*. The underwood is characterized by the occurrence of several nemoral species, as, for

example, *Omphalodes nitida*, *Polystichum setiferum*, *Carex pendula*, *Teucrium scorodonia* subsp. *scorodonia*, *Arum italicum*, *Viola riviniana*, *Osmunda regalis*, *Brachypodium sylvaticum*, *Athyrium filix-femina*, and lianas like *Hedera hibernica*, *Rubus ulmifolius*, *Lonicera hispanica*, etc. (table 19, holotypus relevé no. 5). *Celtis australis* and *Vinca difformis* normally appear in warmer zones. *Omphalodes nitida*, *Linaria triornithophora*, *Quercus robur* subsp. *broteroana*, *Angelica sylvestris*, *Corylus avellana*, *Osmunda regalis*, *Luzula henriquesii*, *Crepis lampanoides*, *Ulmus glabra*, *Anemone albida*, *Euphorbia dulcis*, *Galium broterianum* and *Celtis australis* are the differential species towards the *Hedero hibernicae-Fraxinetum angustifoliae*, also a Galician-Portuguese community, although Mediterranean. In the latter we highlight the presence of *Cornus sanguinea*, *Rosa corymbifera*, *Rosa arvensis*, *Clematis vitalba*, *Ligustrum vulgare* and *Quercus robur* subsp. *robur* which are absent from the *Omphalodo nitidae-Fraxinetum angustifoliae*. It occupies deep, humid soils (saturated during winter time); contacting hygrophilous *Scrophulario scorodoniae-Alnetum glutinosae*'s and mesophilous *Viburno tini-Quercetum broteroanae*' forests, rarely with mesotrophic *Hyperico androsaemi-Quercetum roboris*' forests, in the transition between narrow valleys with steep walls and broader ones. This communities has been frequently destroyed and replaced by croplands, due to the soil's richness. However, the progressive land abandonment is favouring their restoration.

[MONTEIRO-HENRIQUES, J.C. COSTA, A. BELLU, AGUIAR & PORTELA-PEREIRA]

Table 19
56.1.12. *Omphalodo nitidae-Fraxinetum angustifoliae* ass. nova hoc loco

Altitude (m)	530	465	663	433	431	342	352	495
Orientation	NW	P	E	W	N	NE	S	S
Surface (m ²)	50	50	200	100	60	150	200	100
Nº of species	10	19	37	51	35	42	23	34
Ordinal number	1	2	3	4	5*	6	7	8
Characteristic species								
<i>Fraxinus angustifolia</i>	3	3	4	4	4	4	3	3
<i>Omphalodes nitida</i>	+	+	1	1	2	1	+	1
<i>Rubus ulmifolius</i>	1	1	2	3	2	1	+	+
<i>Hedera hibernica</i>	.	2	2	3	2	2	3	2
<i>Salix atrocinerea</i>	.	1	3	2	2	2	1	.
<i>Frangula alnus</i>	.	2	1	+	2	1	.	1
<i>Quercus robur</i> subsp. <i>broteroana</i>	.	.	1	1	1	+	2	1
<i>Angelica sylvestris</i>	.	1	+	+	1	+	.	1
<i>Polystichum setiferum</i>	.	.	.	1	2	2	1	2
<i>Corylus avellana</i>	.	.	.	2	1	+	1	1
<i>Lonicera hispanica</i>	+	.	1	1	.	2	1	.
<i>Crepis lampanoides</i>	.	.	1	+	1	2	.	+
<i>Teucrium scorodonia</i>	.	.	1	+	2	2	.	.
<i>Arum italicum</i>	.	.	.	+	.	1	1	+
<i>Osmunda regalis</i>	.	.	2	+	+	.	.	.
<i>Castanea sativa</i>	.	.	.	+	1	1	.	+
<i>Sambucus nigra</i>	.	+	+	.	.	.	+	1
<i>Alnus glutinosa</i>	.	.	.	1	.	.	2	1
<i>Carex pendula</i>	.	.	1	.	+	.	2	.
<i>Brachypodium sylvaticum</i>	.	.	.	+	.	2	.	1
<i>Blechnum spicant</i>	.	.	1	1	1	.	.	.
<i>Crataegus monogyna</i>	2	+	.	+	.	.	.	.
<i>Athyrium filix-femina</i>	+	.	2	+	.	.	.	.

<i>Viola riviniana</i>	.	.	+	.	1	.	.	1
<i>Stellaria holostea</i>	+	.	.	.	+	1	.	.
<i>Sedum forsterianum</i>	.	.	+	2	.	+	.	.
<i>Scrophularia scorodonia</i>	.	+	.	+	+	.	.	.
<i>Luzula sylvatica</i> subsp. <i>henriquesii</i>	.	.	.	1	.	2	.	.
<i>Celtis australis</i>	.	.	.	.	.	.	1	1
<i>Aquilegia vulgaris</i>	.	.	.	.	1	.	.	+
<i>Ranunculus ficaria</i>	.	.	+	.	.	.	.	+
<i>Vitis vinifera</i> sl.	.	.	.	.	+	+	.	.
<i>Linaria triornithophora</i>	.	.	.	.	.	+	+	.
<i>Dryopteris affinis</i>	.	.	.	.	3	.	.	.
<i>Tamus communis</i>	.	.	.	2	.	.	.	.
<i>Prunus avium</i>	.	.	.	.	.	.	.	.
<i>Quercus pyrenaica</i>	.	.	1	.	.	.	.	.
<i>Bryonia dioica</i>	.	.	.	1	.	.	.	.
<i>Fraxinus angustifolia</i> (frut.)	.	.	.	1	.	.	.	.
<i>Ulmus glabra</i>	.	.	.	.	.	1	.	.
<i>Rosa canina</i>	.	.	.	.	.	1	.	.
<i>Phyllitis scolopendrium</i>	.	.	.	.	.	.	1	.
<i>Vinca difformis</i>	.	.	.	.	.	.	1	.
<i>Euphorbia amygdaloides</i>	.	.	.	.	.	.	.	1
<i>Euphorbia dulcis</i>	+	.	.	.	.	.	.	.
<i>Dryopteris affinis</i> subsp. <i>borreri</i>	.	.	+	.	.	.	.	.
<i>Anemone albida</i> subsp. <i>trifida</i>	.	.	+	.	.	.	.	.
<i>Primula acaulis</i>	.	.	+	.	.	.	.	.
<i>Fragaria vesca</i>	.	.	.	+	.	.	.	.
<i>Stellaria neglecta</i>	.	.	.	.	.	+	.	.
<i>Humulus lupulus</i>	.	.	.	.	.	.	+	.
Companions species								
<i>Dactylis lusitanica</i>	.	.	2	+	1	1	.	1
<i>Erica arborea</i>	1	.	+	1	+	+	.	.
<i>Chelidonium majus</i>	.	.	+	.	+	+	+	+
<i>Pteridium aquilinum</i>	.	3	1	.	2	1	.	.
<i>Geranium robertianum</i>	.	1	.	2	.	.	1	+
<i>Laurus nobilis</i>	.	1	.	.	+	.	1	+
<i>Asplenium quadrivalens</i>	.	.	.	.	+	+	+	+
<i>Prunella vulgaris</i>	.	.	+	.	+	+	.	+
<i>Galium aparine</i>	+	.	.	3	.	2	.	.
<i>Ranunculus repens</i>	.	1	.	+	.	.	.	2
<i>Digitalis purpurea</i>	.	.	.	+	.	+	.	+
<i>Galium mollugo</i>	.	.	.	1	2	.	.	.
<i>Anthoxanthum odoratum</i>	.	+	.	1	.	.	.	.
<i>Asplenium onopteris</i>	.	.	.	+	.	.	.	1
<i>Ruscus aculeatus</i>	.	.	.	+	.	.	.	1
<i>Rumex conglomeratus</i>	.	.	+	.	.	1	.	.
<i>Lotus pedunculatus</i>	.	.	+	+	.	.	.	.
<i>Ulex minor</i>	.	.	+	.	+	.	.	.
<i>Crocus serotinus</i> subsp. <i>clusii</i>	.	.	+	.	+	.	.	.
<i>Sibthorpia europaea</i>	.	.	+	.	.	+	.	.
<i>Mentha suaveolens</i>	.	.	.	+	+	.	.	.
<i>Lamium maculatum</i>	.	.	.	+	.	.	.	+
<i>Polypodium interjectum</i>	.	.	.	.	+	+	.	.
<i>Solanum chenopodioides</i>	.	.	.	.	.	+	.	+

Other companion species: + *Cytisus multiflorus*, + *Peucedanum officinale*, + *Plantago major*, + *Vicia sativa* in 2; + *Oenanthe crocata*, + *Crepis capillaris*, + *Anthriscus caucalis*, + *Potentilla erecta* in 3; + *Holcus lanatus*, + *Helleborus foetidus*, + *Silene latifolia*, + *Chaerophyllum temulum*, + *Galium broterianum*, + *Juncus effusus*, + *Urtica dioica*, + *Malva tournefortiana*, + *Lapsana communis*, + *Rumex acetosa* in 4; + *Epilobium obscurum* in 5; 1 *Saxifraga spathularis*, 1 *Geranium purpureum*, + *Heracleum sphondylium*, + *Origanum virens*, + *Agrostis stolonifera* in 6; + *Asplenium billottii* in 7; 1 *Eupatorium cannabinum*, + *Rubia peregrina* in 8

Localities: 1: Portela de Lá, Mões (Castro Daire), 2: Ucanha, Gouviães (Tarouca); 3: Meridãos, Tendais (Cinfães); 4: Picão (Castro Daire); 5* (*holotypus*): Valverde, Tendais (Cinfães); 6: Enxedrô, Tendais (Cinfães); 7: between Arinho and Vila Seca, Ermida (Castro Daire); 8: Eiriz, Parada de Ester (Castro Daire)

Phagnalo saxatilis-Dianthetum barbati C. Lopes, Pinto-Gomes, Lousã & Ladero *ass. nova hoc loco* (28.3.1.)
[*Phagnalo saxatilis-Dianthetum barbati* C. Lopes 2001 nom. inval. (art. 1)]

(*Phagnalo-Rumicetea indurati*, *Phagnalo saxatilis-Rumicetalia indurati*, *Calendulo lusitanicae-Antirrhinion linkiani*)

Diagnosis: Chasmophytic association that occupies xeric biotopes and large dry fissures of Jurassic limestones, gravel, loamy earthy embankments, tuffs and calcareous sandstones, mostly sunny and facing south. In the northern part of the Dividing Portuguese. Mediterranean plu-

viseasonal-oceanic, lowers mesomediterranean, subhumid to humid bioclimate. Characteristic combination: *Dianthus cintranus* subsp. *barbatus*, *Phagnalon saxatile*, *Antirrhinum linkianum* *Micromeria juliana*, *Linaria supina*, *Melica minuta* (Table 20, *holotypus* relevé n° 4). It requires greater edaphic dryness than *Sileno longiciliae-Antirrhinetum linkiani*, thus lacking in its composition the species *Calendula lusitanica*, *Silene longicilia*, *Biscutella lusitanica*, *Saxifraga cintrana* and *Saxifraga granulata*.

[C. LOPES, PINTO-GOMES, LOUSÃ & LADERO]

Table 20

28.3.1. ***Phagnalo saxatilis-Dianthetum barbati*** *ass. nova hoc loco*

Altitude (m)	110	110	70	400	70	70	350
Orientation	S	S	S	SE	SW	N	N
Surface (m ²)	10	10	20	30	400	40	40
N° of species	8	8	5	5	6	8	11
Ordinal number	1	2	3	4*	5	6	7
Characteristic species							
<i>Phagnalon saxatile</i>	1	2	3	3	2	3	3
<i>Dianthus barbatus</i>	+	+	1	1	1	1	1
<i>Antirrhinum linkianum</i>	1	+	+	.	1	1	+
<i>Micromeria juliana</i>	2	2	+	1	1	+	.
<i>Linaria supina</i>	+	1	+	.	.	.	.
<i>Melica minuta</i>	.	.	.	.	+	+	+
Companion species							
<i>Helichrysum stoechas</i>	.	.	.	.	1	1	+
<i>Sedum album</i>	1	.	.	+	.	.	+
<i>Hyparrhenia sinaica</i>	+	+	+	.	.	.	.
<i>Dactylis hispanica</i>	.	.	.	.	.	+	1
<i>Urginea maritima</i>	.	1	.	.	.	.	+
<i>Melica magnolii</i>	.	.	.	.	.	+	+
<i>Scrophularia canina</i>	+	.	.	.	.	.	.
<i>Carex hallerana</i>	.	+	.	.	.	.	.
<i>Piptatherum miliaceum</i>	+	.	.	.	.	.	+
<i>Thymus sylvestris</i>	.	.	.	.	.	.	+

Localities: 1, 2: Condeixa; 3, 5, 6: Souselas; 4* (*holotypus*), 7: Chancas

Phalacrocarpo hoffmannseggii-Festucetum merinoi Aguiar *ass. nova hoc loco* (45.2.5.)

[*Phalacrocarpo hoffmannseggii-Festucetum elegantis* Aguiar 2001 nom. inval. (art.1)]

(*Stipo gigantea-Agrostietea castellanæ*, *Agrostietalia castellanæ*, *Festucion elegantis*)

Festuca merinoi grassland, geovivacious of the *Phalacrocarpo oppositifolii-Festucetum merinoi*, characterized by the presence of the endemics species *Phalacrocarpum hoffmannseggii* and *Armeria transmontana* (Table 21, *holotypus* relevé n°6). It occurs in truncated soils or on almost flat rocky platforms with a thick layer of soil, in clearings and fringes of the *Genisto falcatae-Quercetum pyrenaicae* or the *Genisto hystricis-Quercetum rotundifoliae* woodlands. It was detected in the Sanabrensean District, in schists or mafic rocks derived soils, under a Mediterranean pluviseasonal-oceanic supramediterranean humid bioclimate.

[AGUIAR]

Phalacrocarpo oppositifolii-Silenetum acutifoliae Honrado, Pulgar, P. Alves & Ortiz *ass. nova hoc loco* (24.2.2.)

(*Asplenietea trichomanis*, *Androsacetalia vandellii*, *Saxifragion willkommianæ*)

Diagnosis: Plant community of rock fissures, endemic to the granite mountains of Northwest Portugal, dominated by *Saxifraga spathularis*, *Phalacrocarpum oppositifolium*, and *Silene acutifolia*, with *Silene marizii*, *Hieracium amplexicaule* and *Murbeckiella boryi* as other casual differentials. It occurs in temperate oceanic submediterranean, supratemperate humid to hyperhumid bioclimate.

Holotypus: Ponte da Barca: Serra Amarela, Louriça, 1280 m, NE, 90°, 1 m²: Characteristic species: 3 *Phalacrocarpum oppositifolium*, 3 *Saxifraga spathularis*, 2 *Silene acutifolia*, 2 *Silene marizii*, 1 *Sedum hirsutum*; Companion species: 1 *Avenula sulcata*, + *Digitalis purpurea*, 1 *Hyacinthoides hispanica*, 1 *Sedum anglicum*.

[J. HONRADO, PULGAR, P. ALVES & ORTIZ]

Phlomidio purpureae-Pistacietum lentisci Capelo & J.C. Costa *ass. nova hoc loco* (59.3.10.)

[*Clematido cirrhosae-Pistacietum lentisci* Capelo in Capelo, Lousã & J.C. Costa 1994 nom. inval. (art. 31), *Oleo sylvestris-Pistacietum lentisci* Capelo 1996 nom. inval. (art. 31)]

(*Quercetea ilicis*, *Pistacia lentisci-Rhamnietalia alaterni*, *Asparago albi-Rhamnion oleoidis*)

Table 21

45.2.5. *Phalacrocarpo hoffmannseggii-Festucetum merinoi* ass. nova hoc loco

Altitude (1=10m)	70	86	85	68	66	120	82	72	125	68
Orientation	W	NE	N	N	NE	N	W	N	W	NW
Surface (m ²)	6	6	25	4	4	10	8	8	6	4
N° of species	7	9	13	15	12	12	10	8	8	7
Ordinal number	1	2	3	4	5	6*	7	8	9	10
Characteristic species										
<i>Festuca merinoi</i>	2	2	3	3	3	3	2	2	5	3
<i>Phalacrocarpum hoffmannseggii</i>	3	2	1	2	2	2	2	3	1	4
<i>Armeria transmontana</i>	.	.	.	.	1	1	+	+	+	+
<i>Avenula lodunensis</i>	.	.	1	+	+	+	+	.	.	.
<i>Rumex angiocarpus</i>	.	+	2	.	+	.	.	.	1	.
<i>Agrostis commista</i>	.	.	+	.	.	+	.	.	.	.
<i>Dianthus langeanus</i>	.	.	1	.	.	.	.	.	.	.
<i>Festuca livida</i>	.	.	.	.	+	.	.	.	.	.
Companion species										
<i>Conopodium marizianum</i>	.	+	+	+	.	.	+	+	.	.
<i>Micropyrum tenellum</i>	1	.	1	.	.	+	.	1	.	.
<i>Sedum forsterianum</i>	.	.	.	+	1	.	.	1	+	.
<i>Sedum hirsutum</i>	2	2	.	.	.	.	1	.	.	.
<i>Halimium viscosum</i>	.	.	2	2	+	.	.	.	.	.
<i>Saxifraga fragosoi</i>	.	.	.	1	+	+	.	.	.	.
<i>Anarrhinum bellidifolium</i>	+	+	1	.	.	.	.	.	.	.
<i>Sedum brevifolium</i>	.	.	.	.	.	1	1	.	.	.
<i>Silene nutans</i>	1	.	.	1	.	.	.	.	.	.
<i>Linaria saxatilis</i>	.	1	.	.	.	.	+	.	.	.
<i>Arenaria montana</i>	.	.	.	1	+	.	.	.	.	.

Other companion species: 1 *Erica arborea* in 1; + *Geranium purpureum*, + *Polypodium vulgare* in 2; 2 *Pterospartum lasianthum*, 1 *Halimium alyssoides*, 1 *Jasione montana* in 3; 1 *Clinopodium arundanum*, 1 *Ranunculus ollissiponensis*, + *Anthoxanthum amarum*, + *Genista falcata*, + *Geum sylvaticum*, + *Luzula forsteri* in 4; + *Erysimum linifolium*, + *Lotus carpetanus* in 5; 1 *Plantago radicata*, + *Anthemis alpestris*, + *Vulpia myuros*, + *Allium sphaerocephalon* in 6; 1 *Cytisus multiflorus*, + *Hypericum linarifolium* in 7; 2 *Arrhenatherum bulbosum*, 1 *Anthoxanthum aristatum* in 8; 1 *Cruciata glabra*, 1 *Galium helodes*, + *Stellaria holostea* in 9; 1 *Genista polygaliphylla*, 1 *Cynosurus effusus*, + *Geranium lucidum*, + *Umbilicus rupestris* in 10

Localities: 1: França (Bragança), 2: Chã de Touro (Alimonde, Bragança), 3: Baceiro (Vilarinho, Bragança), 4, 5: Rabal (Bragança), 6* (*holotypus*): Rebordãos (Bragança), 7: Fontes Barrosas (Bragança), 8: Soutelo (Carregosa, Bragança); 9: Sr° da Serra (Rebordãos, Bragança), 10: Palácios (Bragança)

Diagnosis: Permanent high shrub community, dominated by large plants of *Pistacia lentiscus* and *Olea sylvestris*. On siliceous substrates, unstable chaos of blocks of shale, greywacke, quartzite or metavolcanite rocks. It occurs in small hills of the Lower Guadiana basin (Mértola) in the Aracense District. *Pistacia lentiscus* may reach 7 - 9 m in height from the base branched, having several branches with a large diameter (0.4 m DBH) and the absence of a single shaft. Under its cover can be found *Aristolochia baetica*, *Clematis cirrhosa*, *Rubia longifolia*, *Smilax aspera*, *Lonicera implexa*, *Jasminum fruticans*, *Phlomis purpurea*, *Daphne gnidium*, *Melica minuta* subsp. *arrecta*, *Arisarum simorrhinum*, *Hyacinthoides hispanica*, *Myrtus communis*, etc., *Asparagus albus* is absent. It occurs in Mediterranean pluvisesional-oceanic, lower mesomediterranean, lower dry bioclimate. See Capelo (1996) table 10 p. 40-41.

Holotypus (Capelo et al. 1994, p. 527): Serra de Alcaria Ruiiva (Mértola), on greywacke blocks and metavolcanite rocks, 340 m, N, 200 m²: Characteristic species: 5 *Pistacia lentiscus*, 2 *Olea sylvestris*, 2 *Phlomis purpurea*, 2 *Myrtus communis*, 3 *Clematis cirrhosa*, 2 *Aristolochia baetica*, 2 *Smilax aspera*, 2 *Rubia longifolia*, 1 *Daphne gnidium*, 1 *Quercus rotundifolia* (pl.), 1 *Lonicera implexa*, 1 *Arisarum simorrhinum*, 1 *Hyacinthoides hispanica*, + *Asplenium onopteris*, Companion species:

2 *Tamus communis*, 1 *Bryonia dioica*, 1 *Cistus ladaniifer*, 1 *Smyrniolum olusatrum*, 1 *Thapsia villosa*, 1 *Rumex induratus*, + *Lavandula sampaioana*, + *Cistus monspeliensis*, + *Calamintha nepeta*, + *Elaeoselinum foetidum*, + *Saxifraga granulata* subsp. *glaucescens*, + *Umbilicus rupestris*, + *Geranium purpureum*, + *Lathyrus angulatus* [CAPELO & J.C. COSTA]

Polygono maritimi-Lotetum glauci J.C. Costa, Capelo, Jardim & Sequeira ass. nova hoc loco (63.2.2.) (*Euphorbia paraliae-Lotion floridi*, *Zygophyllo fontanesii-Polycarphaetalia nivea*, *Polycarphae niveae-Traganea moquini*)

Diagnosis: Dune association on elevated platforms in Ponta de S. Lourenço (Madeira Island), dominated by *Lotus glaucus* subsp. *glaucus* accompanied by *Polygonum maritimum*, *Crepis divaricata*, *Senecio incrassatus*, *Calendula maderensis*, *Euphorbia terracina*, etc. Costa et al. (2004) have reported it in this territory (Table 70 p. 173) as the association of Porto Santo *Euphorbia paraliae-Lotetum (glauci) floridi*, however we do not consider it has the same syntaxon, since in Madeira island *Lotus glaucus* subsp. *floridus*, *Euphorbia paralias* and *Calystegia soldanella* are not present, and *Lotus glaucus* subsp. *glaucus* and *Calendula maderensis* do not occur in Porto Santo. It occurs in Mediterranean xeric-oceanic, inframediterranean, upper dry bioclimate.

Holotypus: Costa et al. (2004) relevé n°2 do table 70, p. 17: Dunes of Piedade, Ponta de S. Lourenço, 135 m, E, 10 m²: Characteristic species: 4 *Lotus glaucus*, 1 *Polygonum maritimum*, + *Calendula maderensis*, + *Crepis divaricata*; Companion species: 1 *Senecio incrassatus*, + *Carpobrotus edulis* + *Euphorbia terracina*.

[J.C. COSTA, CAPELO, JARDIM & SEQUEIRA]

Polysticho falcinelli-Ericetum canariensis Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000 corr. Capelo, J.C. Costa, Lousã, Jardim, Sequeira & Rivas-Martínez corr. hoc loco (64.5.1.)

[≡ *Polysticho falcinelli-Ericetum arboreae* Capelo, J.C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez 2000] (*Polysticho falcinelli-Ericetum canariensis*, *Pruno hixae-Lauretalia novocanariensis*, *Pruno hixae-Lauretea novocanariensis*)

Taxonomic correction: *Erica arborea* should be *Erica canariensis*.

[CAPELO, J.C. COSTA, LOUSÃ, JARDIM, SEQUEIRA & RIVAS-MARTÍNEZ]

Polysticho falcinelli-Ericetum canariensis Rivas-Martínez, Capelo, J.C. Costa, Lousã, Fontinha, Jardim & Sequeira 2002 corr. Rivas-Martínez, Capelo, J.C. Costa, Lousã, Jardim & Sequeira hoc loco (64.5.)

[≡ *Polysticho falcinelli-Ericetum arboreae* Rivas-Martínez, Capelo, J.C. Costa, Lousã, Fontinha, Jardim & Sequeira 2002] (*Pruno hixae-Lauretalia novocanariensis*, *Pruno hixae-Lauretea novocanariensis*)

Taxonomic correction: *Erica arborea* should be *Erica canariensis*.

[RIVAS-MARTÍNEZ, CAPELO, J.C. COSTA, LOUSÃ, JARDIM & SEQUEIRA]

Pseudarrhenathero longifolii-Celticetum giganteae Honrado & P. Alves ass. nova hoc loco (45.3.11.)

(*Stipo giganteae-Agrostietum castellanae*, *Agrostietalia castellanae*, *Agrostio castellanae-Celticetum giganteae*)

Diagnosis: Perennial xerophilous grassland, predominantly submediterranean, typical of acidic soils in windy biotopes of the Northwest Iberian Peninsula (Portuguese-Galician sector); dominant species are *Celtica gigantea*, *Avenula sulcata*, *Agrostis x fouilladei* and *Pseudarrhenatherum longifolium*.

Holotypus: Montalegre: Serra do Gerês, Cabril, confluence of the Pena Calva and Sabroso streams, 780 m, SE, 10 m²: Characteristic species: 3 *Celtica gigantea*, 2 *Pseudarrhenatherum longifolium*, 1 *Avenula sulcata*, 1 *Centaurea geresensis*, 1 *Thymus caespititius*, 1 *Festuca elegans*, + *Solidago virgaurea*; Companion species: 1 *Hypochaeris radicata*, 1 *Festuca indigesta*.

[J. HONRADO & P. ALVES]

Pteridio aquilini-Ericetum maderincolae J.C. Costa, Capelo, Jardim, Sequeira & Rivas-Martínez ass. nova hoc loco (64.1.2.)

[Community of *Erica maderincola* and *Erica arborea* J.C. Costa, Capelo, Jardim, Sequeira, Espírito Santo, Lousã, Fontinha, Aguiar & Rivas-Martínez 2004]

(*Pruno hixae-Lauretea novocanariensis*, *Andryalo-Ericetalia*, *Myrico fayae-Ericetum canariensis*)

Diagnosis: Community of *Erica maderincola*, *Erica canariensis* and *Pteridium aquilinum*, with 1-2 m height, occurring in the most elevated areas of Madeira Island, on rocky (leptosols) or subjected to frequent fires, in temperate hyperoceanic, upper mesotemperate to supratemperate submediterranean, hyperhumid to ultrahyperhumid bioclimate. Subseral of *Polysticho falcinelli-Ericetum canariensis*, which is distinguished by the bush physiognomy and the absence of nemoral species (*Polysticho falcinellum*, *Ranunculus cortusifolius* var. *minor*, *Sibthorpia peregrina*, *Teucrium francoi*, *Polystichum setiferum*, *Neotinea maculata*, etc.), *Vaccinium padifolium*, *Sorbus maderensis* and from *Globulario salicinae-Ericetum canariensis* by the absence of *Myrica faya* and taxa from *Rhamno-Oleetea cerasiformis* (Table 22, *holotypus* relevé no. 1).

Table 22

64.1.2. *Pteridio aquilini-Ericetum maderincolae* ass. nova hoc loco

Altitude (1=10m)	128	184	175	160	168	145
Orientation	E	SW	NE	E	S	W
Surface (m ²)	200	100	100	100	100	200
N° of species	6	5	7	9	8	9
Ordinal number	1*	2	3	4	5	6
Characteristic species						
<i>Erica maderincola</i>	5	4	3	3	4	4
<i>Erica canariensis</i>	1	2	3	3	2	1
<i>Pteridium aquilinum</i>	2	2	1	3	3	3
Companion species						
<i>Thymus micans</i>	+	1	+	1	+	+
<i>Agrostis castellana</i>	.	1	+	1	.	1
<i>Viola riviniana</i>	1	.	.	1	+	+
<i>Cytisus scoparius</i>	.	.	2	.	1	2
<i>Hypochaeris radicata</i>	.	.	+	.	+	1
<i>Ornithopus perpusillus</i>	+	.	.	+	.	+
<i>Rumex acetosella</i>	.	.	.	+	+	.
<i>Umbilicus rupestris</i>	.	.	.	+	.	.

Localities: Madeira Island: 1* (*holotypus*): Paul da Serra, at the junction to Calheta; 2, 3, 5: Pico Ruivo; 4: Bica da Cana; 6: Paul da Serra

[J.C. COSTA, CAPELO, JARDIM, SEQUEIRA & RIVAS-MARTÍNEZ]

Puccinellio tenuifoliae-Limonietum plurisquamati J.C. Costa, Neto & Portela-Pereira in J.C. Costa, Arsénio, Monteiro-Henriques, Portela-Pereira, T. Almeida & Izco 2009 corr. J.C. Costa & Caperta hoc loco (18.3.2.)

[≡ *Puccinellio tenuifoliae-Limonietum daveaui*]

(*Juncetea maritimi*, *Glauco-Puccinellietalia*, *Limonio ovalifolii-Frankenion laevis*)

Taxonomic correction: *Limonium daveaui* should be *Limonium plurisquamatum*.

[J.C. COSTA & CAPERTA]

Quercenion rivasmartinezii-suberis Capelo suball. nova hoc loco (59.2b.)

(*Quercu rotundifoliae-Oleion sylvestris*, *Quercetalia ilicis*, *Quercetea ilicis*)

Forests of *Quercus suber* and *Quercus rivasmartinezii* on silicon substrates or compact decarbonated limestone, thermomediterranean or, exceptionally, lower mesomediterranean, subhumid to upper humid, with intense oceanic character (subhyperoceanic, hyperoceanic, euoceanic), in Coastal Lusitanian-Andalusian Province.

Characteristic species: *Avenella stricta*, *Quercus rivasmartinezii*.

Differential species: *Bupleurum fruticosum*, *Centaurea crocata*, *Centaurea vicentina*, *Lavandula viridis*, *Myrica faya*, *Picris spinifera* s.l., *Quercus x marianica*, *Rhododendretum ponticum*, *Senecio lopezii*.

Typus: *Viburno tini-Quercetum cocciferae* Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990 [in *Itinera Geobot.* 3: 54, 1990] corr. *Viburno tini-Quercetum rivasmartinezii* Capelo & J.C. Costa 2001 [in *Silva Lusit.* 9 (2): 271, 2001] (59.2.13.).

Asparago aphylli-Quercetum suberis J.C. Costa, Capelo, Lousã & Espírito Santo 1996 (59.2.10.)

Lauro nobilis-Quercetum rivasmartinezii R. Caraça, J.C. Costa, Neto & Espírito Santo in J.C. Costa, R. Caraça, Neto, Espírito Santo & Capelo ined. ((59.2.11.))

Lavandulo viridis-Quercetum suberis Quinto-Canas, Vila-Viçosa, Meireles, P. Ferreira, Martínez-Lombardo, Cano & Pinto-Gomes 2010 (59.2.12.) (fig. 67, page 117)

[*Myrto communis-Quercetum suberis sensu* Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990 non Barbero, Benabid, Quézel & Rivas-Martínez 1981 ex Rivas-Martínez, Costa & Izco 1986, *Teucrio baetici-Quercetum suberis* Rivas-Martínez in Díez Garretas, Cuenca & Asensi 1986 *centauretosum crocatae* Neto, Arsénio & J.C. Costa 2010, *Teucrio baeticae-Quercetum suberis seneciotosum lopezii* Capelo 2007 nom. inval. (art. 1)]

Viburno tini-Quercetum rivasmartinezii Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990 corr. Capelo & J.C. Costa 2001 (59.2.13.) (fig. 68, page 117)

[*Viburno tini-Quercetum cocciferae* Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990]

[CAPELO]

Scrophulario sublyratae-Lavateretum arboreae J.C. Costa, Capelo, Neto & Lousã ass. nova hoc loco (30.4.2.) (*Artemisieta vulgaris*, *Artemisienea vulgaris*, *Brassicola oleraceae-Lavateretalia arboreae*, *Brassicion oleraceae*)

Diagnosis: Ornitocoprophilous, nitrophilous and aerohaline association, characterized by *Lavatera arborea*, *Beta maritima*, *Calendula algarbiensis*, *Scrophularia sublyrata*, *Frankenia laevis*, *Dittrichia viscosa*, etc., (Table 23, *holotypus* relevé nº 1). It occurs in islands, reefs and coastal cliffs where the sea beats strongly, in the Sadensean-Dividing Portuguese Subprovince. Indifferent edaphic, it can be observed in granites (the Berlengas Archipelago), syenites (Cape Roca) and limestones (Cape Carvoeiro and Arrábida). It occurs in Mediterranean pluviseasonal-oceanic, euhyperoceanic, lower mesomediterranean to upper thermomediterranean, dry bioclimate.

[J.C. COSTA, CAPELO, NETO, ARSÉNIO & LOUSÃ]

Table 23

30.4.2. ***Scrophulario sublyratae-Lavateretum arboreae*** ass. nova hoc loco

Orientation	E	SE	SW	W	S	NW	SW
Surface (m ²)	8	10	10	10	20	10	10
Nº of species	12	14	16	12	11	9	14
Ordinal number	1*	2	3	4	5	6	7
Characteristic species							
<i>Lavatera arborea</i>	4	3	3	3	2	4	3
<i>Beta maritima</i>	+	1	1	+	+	1	1
<i>Calendula algarbiensis</i>	1	1	+	1	1	+	+
<i>Scrophularia sublyrata</i>	1	1	+	+	3	.	.
<i>Dittrichia viscosa</i>	.	.	+	.	+	.	+
<i>Piptatherum miliaceum</i>	.	.	+	+	.	.	.
<i>Hyoscyamus niger</i>	.	.	+	.	.	.	.
Companion species							
<i>Frankenia laevis</i>	+	1	1	1	1	1	1
<i>Crithmum maritimum</i>	+	+	+	.	1	+	+
<i>Dactylis marina</i>	1	+	.	+	+	.	+
<i>Plantago occidentalis</i>	+	+	.	+	.	.	+
<i>Carpobrotus edulis</i>	.	1	.	1	1	.	2
<i>Atriplex halimus</i>	.	.	+	.	1	+	+
<i>Daucus halophilus</i>	.	.	+	+	+	.	+
<i>Suaeda vera</i>	+	1	+	.	.	.	.
<i>Lobularia maritima</i>	.	.	.	+	.	+	+
<i>Armeria berlengensis</i>	+	1	.	.	.	.	.
<i>Armeria pseudarmeria</i>	.	.	.	+	.	.	1
<i>Myrolimon ferulaceum</i>	.	.	+	.	.	+	.
<i>Herniaria berlengiana</i>	+	+	.	.	.	.	.
<i>Spergularia rupicola</i>	+	+	.	.	.	.	.

Other companion species: + *Asplenium marinum* in 2; + *Inula crithmoides*, + *Spergularia australis*, + *Limonium plurisquamatum* in 3; + *Limonium multiflorum* in 6; + *Limonium virgatum* in 7

Localities: 1* (*holotypus*): Farilhão Grande Islet (Peniche); 2: Berlenga Grande Island (Peniche); 3: Cabo Carvoeiro (Peniche); 4: Ursa (Cabo da Roca, Sintra); 5: Chã dos Navegantes (Cabo Espichel, Sesimbra); 6: Papua (Cabo Carvoeiro, Peniche); 7: Cabo da Roca (Sintra);

Selino broteri-Molinietum caeruleae P. Alves, Aguiar & Honrado ass. nova hoc loco (46.2.10.)

(*Molinio-Arrhenatheretea*, *Molinietalia caeruleae*, *Juncion acutiflori*)

Diagnosis: Meadow communities typical of acidophilous peaty soils, rich in minerals and ions resulting from cyclical winter flooding and drying in the summer, occurring on alluvial plains on thermotemperate to mesomediterranean, euhyperoceanic to subhyperoceanic belt in Northwest Portugal (rivers Minho, Lima and Tâmega), and can likely occur in southern Galicia. These communities are dominated by *Molinia caerulea* accompanied with *Selinum broteri*, *Juncus conglomeratus*, *Festuca arundinacea*, *Carex distans*, *Centaurea rivularis*, *Scirpoides holoschoenus*, *Juncus acutiflorus*, *Agrostis stolonifera*, etc., and is seral of the hygrophilous heaths of the *Gentiano pneumonanthes-Genistetum ancistrocarpae* association.

Holotypus: Chaves: Between Chaves and Faiões, 350 m, 4 m²: Characteristic species: 4 *Molinia caerulea*, 1 *Juncus conglomeratus*, 1 *Festuca arundinacea*, 1 *Carex distans*, + *Centaurea rivularis*, + *Selinum broteri*, + *Scirpoides holoschoenus*, + *Genista ancistrocarpa*, + *Juncus acutiflorus*, + *Agrostis stolonifera*; Companion species: + *Galium palustre*, + *Lobelia urens* + *Polygala serpyllifolia*.

[P. ALVES, C. AGUIAR & J. HONRADO]

Siderito multiflorae-Echietum portosanctensis Jardim, Capelo, Sequeira, Aguiar & J.C. Costa ass. nova hoc loco (62.1.5.)

(*Rhamno crenulatae-Oleetea cerasiformis*, *Rhamno crenulatae-Oleetalia cerasiformis*, *Mayteno umbellatae-Oleion maderensis*)

Table 24

62.1.5. *Siderito multiflorae-Echietum portosanctensis*
ass. nova hoc loco

Altitude (m)	420	400	450
Orientation	N	N	N
Surface (m ²)	20	100	50
N° of species	9	15	6
Ordinal number	1	2*	3

Characteristic species

<i>Echium portosanctensis</i>	2	3	3
<i>Helichrysum melaleucum</i>	3	3	.
<i>Sideritis multiflora</i>	.	2	1
<i>Carlina salicifolia</i>	2	.	+
<i>Phyllis nobla</i>	+	+	.
<i>Cheirolophus massonianus</i>	.	2	.
<i>Erica madericola</i>	.	.	2
<i>Hypericum glandulosum</i>	.	1	.
<i>Plantago maderense</i>	.	+	.
<i>Erysimum arbuscula</i>	.	+	.
<i>Lotus argyrodus</i>	.	+	.

Companion species

<i>Matthiola maderensis</i>	2	+	.
<i>Dactylis hyelodes</i>	1	+	.
<i>Davallia canariensis</i>	+	1	.
<i>Aeonium glandulosum</i>	+	.	+

Other companion species: 1 *Andryala glandulosa* in 1; 1 *Pericallis aurita*, + *Rumex canariensis*, + *Senecio incrassatus* in 2; 2 *Pteridium aquilinum* in 3;

Localities: Porto Santo Island: 1, 2* (*holotypus*): 3 Pico Branco

Diagnosis: Nanophanerophytic community characterized by the endemic species of Porto Santo *Echium portosanctensis* and *Sideritis candicans* var. *multiflora*, accompanied by *Helichrysum melaleucum*, *Carlina salicifolia*, *Phyllis nobla*, *Cheirolophus massonianus*, etc. (Table 24, *holotypus* relevé no. 2). It occurs in the vertical cliffs of the Pico Branco, in the northern slopes of the island of Porto Santo, on leptosols derivatives of trachytes, in Mediterranean xeric-oceanic, inframediterranean, dry bioclimate.

[JARDIM, CAPELO, SEQUEIRA, AGUIAR & J.C. COSTA]

Sileno acutifoliae-Umbilicetum rupestris Honrado, P. Alves & B. Caldas ass. nova hoc loco (25.2.5.)

(*Parietarietea*, *Parietarietalia*, *Cymbalario-Asplenion*)

Diagnosis: Rupicolous urban plant community typical of stone walls in rural villages of the Northwest Iberian Peninsula, in temperate-oceanic supratemperate submediterranean bioclimate, dominated by *Silene acutifolia*, *Sedum hirsutum* and *Umbilicus rupestris*.

Holotypus: Montalegre: Sezelhe, 910 m, NE, 4 m²: Characteristic species: 3 *Sedum hirsutum*, 2 *Silene acutifolia*, 1 *Umbilicus rupestris*; Companion species: 1 *Agrostis x fouilladei*, 1 *Galium saxatile*, + *Rumex angiocarpus*, + *Digitalis purpurea*.

[J. HONRADO, P. ALVES & B. CALDAS]

Smyrnio olusatris-Scrophularietum grandiflorae C. Lopes, Pinto-Gomes, Lousã, Ladero & J.C. Costa ass. nova hoc loco (36.1.6.)

[*Scrophulario grandiflorae-Smyrniotum olusatris* C. Lopes 2001 nom. inval. (artigo 1)]

(*Galio-Urticetea*, *Galio aparines-Alliarietalia petiolatae*, *Galio-Alliarion petiolatae*, *Smyrniotum olusatris*)

Hemicryptophytic and megaforbic association, in fringes of woods, edges of roads and land removed limestone and clay soils with organic matter. The bioclimate is Mediterranean pluviseasonal-oceanic mesomediterranean, subhumid to humid of the Dividing Portuguese Sector. It is characterized by *Scrophularia grandiflora*, *Smyrniotum olusatrum*, *Galium aparine*, *Silene dioica*, *Torilis neglecta*, *Urtica dioica*, *Borago officinalis*, *Geranium purpureum*, *Fumaria capreolata*, *Rumex conglomeratus*, *Bryonia dioica*, etc. (Table 25, *holotypus* relevé n° 1).

[C. LOPES, PINTO-GOMES, LOUSÃ, LADERO & J.C. COSTA]

Teucrio francoi-Origanetum virentis J.C. Costa, Capelo, Jardim, Sequeira, Lousã & Rivas-Martínez 2008 ass. nova hoc loco (38.3.2.)

[*Teucrio francoi-Origanetum virentis* J.C. Costa, Capelo, Jardim, Sequeira, Espírito Santo, Lousã, Fontinha, Aguiar & Rivas-Martínez 2004 nom. inval. (art. 21, 5)]

(*Ranunculo cortusifolii-Geranion canariensis*, *Origanetalia vulgaris*, *Trifolio-Geranietea*)

Semi-shade hemicryptophytic community, on external fringes and clearings of *Polysticho falcinelli-Ericetum canariensis*. It occurs in temperate hyperoceanic, upper mesotemperate to supratemperate (submediterranean), hyperhumid to ultrahyperhumid bioclimate in Madeira Island. Characterized by *Origanum virens*, *Teucrium francoi*, *Clinopodium arundanum*, *Viola paradoxa*, *Viola riviniana*, *Ranunculus cortusifolius* var. *minor*, etc. See Costa et al. (2004) table 34.

Table 25

***Smyrnio olusatri-Scrophularietum grandiflorae* ass. nova hoc loco**

Altitude (m)	50	200	500	250	290
Orientation	S		N		
Surface (m ²)	20	16	16	10	18
N° of species	16	20	23	20	20
Ordinal number	1*	2	3	4	5

Characteristic species

<i>Scrophularia grandiflora</i>	2	4	1	2	1
<i>Borago officinalis</i>	1	2	1	1	1
<i>Smyrnia olusatrium</i>	+	+	2	1	1
<i>Galium aparine</i>	1	1	1	1	1
<i>Torilis neglecta</i>	1	1	1	+	+
<i>Silene dioica</i>	1	1	+	+	.
<i>Urtica dioica</i>	.	.	+	1	1
<i>Bryonia dioica</i>	.	.	+	+	+
<i>Parietaria judaica</i>	.	+	1	.	.
<i>Ballota foetida</i>	.	.	.	.	+

Companion species

<i>Fumaria capreolata</i>	1	1	+	1	+
<i>Bromus diandrus</i>	+	1	1	1	+
<i>Avena sterilis</i>	+	1	+	1	1
<i>Lavatera cretica</i>	+	1	+	+	+
<i>Rapistrum rugosum</i>	+	+	+	1	+
<i>Foeniculum piperitum</i>	1	1	+	+	.
<i>Geranium molle</i>	.	+	+	1	1
<i>Rumex conglomeratus</i>	.	+	+	+	+
<i>Hypericum perforatum</i>	+	1	1	.	.
<i>Geranium purpureum</i>	.	1	+	+	.
<i>Melissa officinalis</i>	.	.	1	+	+
<i>Arum italicum</i>	.	.	1	1	.
<i>Galactites tomentosa</i>	.	+	.	.	1
<i>Dittrichia viscosa</i>	+	+	.	.	.
<i>Piptatherum miliaceum</i>	+	+	.	.	.
<i>Verbascum pulverulentum</i>	.	.	+	.	+
<i>Mercurialis ambigua</i>	+	.	+	.	.
<i>Geranium dissectum</i>	.	.	.	+	+
<i>Geranium lucidum</i>	.	.	.	.	+

Localities: 1* (*holotypus*): 3 Quinta da Bencanta, Escola Superior Agrária de Coimbra; 2: Poço (Condeixa); 4: Road to Chancas (Penela); 5 Alvorge (Ansião)

Holotypus: Costa et al. (2004) table 34 relevé n° 4 p 123: Pico Ruivo, 1700 m, SE, 2 m²: Characteristic species: 4 *Origanum virens*, 2 *Teucrium francoi*, 1 *Viola riviniana*, 1 *Viola paradoxa*, + *Clinopodium arundanum*; Companion species: + *Hypericum humifusum*, + *Pteridium aquilinum*.

[J.C. COSTA, CAPELO, JARDIM, SEQUEIRA, LOUSÃ & RIVAS-MARTÍNEZ]

Thymelaeo broteriana-Juniperetum alpinae Honrado, P. Alves & B. Caldas ass. nova hoc loco (49.1.3.)

(*Calluno-Ulicetea*, *Ulicetalia minoris*, *Ericion umbellatae*, *Ericenion aragonensis*)

Low scrub of heath and dwarf juniper, in temperate oceanic, supratemperate and supramediterranean (sub-mediterranean) areas of Northwest Portugal (Serra do Gerês). It is formed by *Juniperus communis* subsp. *alpina*, *Calluna vulgaris*, *Erica australis* subsp. *aragonensis*, *Vaccinium myrtillus* and *Ulex minor*. The endemics *Thymelaea broteriana* and *Carex asturica* are differentials.

Holotypus: Terras de Bouro: Serra do Gerês, Lomba do Pau, 1360 m, 25 m²: Characteristic species: 4 *Juniperus alpina*, 2 *Erica aragonensis*, 2 *Halimium alyssoides*, 1 *Calluna vulgaris*, 1 *Carex asturica*, 1 *Pterospartum cantabricum*, 1 *Lithodora prostrata*, 1 *Agrostis curtisii*, + *Thymelaea broteriana*, + *Polygala microphylla*. Companion species: 1 *Vaccinium myrtillus*, + *Erythronium dens-canis*.

[J. HONRADO, P. ALVES & B. CALDAS]

Thymo villosi-Ulicetum latebracteati (J.C. Costa, Capelo, Espírito Santo & Lousã 2002) J.C. Costa & Arsénio st. nov. hoc loco (49.1.19.)

(*Ericenion umbellatae*, *Ericion umbellatae*, *Calluno-Ulicetalia minoris*, *Calluno vulgaris-Ulicetea minoris*)

Basion.: *Ulicetum latebracteato-minoris* (Br.-Bl., P. Silva & Rozeira 1964) Rivas-Martínez 1979 *thymetosum villosi* J.C. Costa, Capelo, Espírito Santo & Lousã in Silva Lusit. 10 (1): 123, 2002.

Mesomediterranean humid subhyperoceanic chamaephytic to nanophanerophytic association, formed by *Ulex latebracteatus*, *Ulex minor*, *Thymus villosus*, *Calluna vulgaris*, *Cistus psilosepalus*, *Pterospartum tridentatum* subsp. *tridentatum*, *Agrostis curtisii*, *Genista triacanthos*, *Erica umbellata*, *Erica scoparia*, *Tuberaria lignosa*, *Simethis mattiazzi*, etc., on eroded sandy soils derived from syenites, in western and northern slopes of Sintra Mountain. Subseral of *Arisaro simorrhini-Quercetum pyrenaicae* (see Costa et al. 2002a).

Holotypus: relevé no. 1 table 4 Costa et al. (2002a), p. 124: Peninha, Serra de Sintra (Sintra), 400 m, NE, 10 m²: Characteristic species: 2 *Ulex latebracteatus*, 3 *Ulex minor*, 2 *Thymus villosus*, 2 *Calluna vulgaris*, 1 *Cistus psilosepalus*, + *Pterospartum tridentatum* subsp. *tridentatum*, companion species: 2 *Pteridium aquilinum*, 1 *Dactylis lusitanica*, 1 *Rubus ulmifolius*, + *Cistus salvifolius*, + *Holcus lanatus*, + *Teucrium scorodonia*, + *Euphorbia characias*, + *Cirsium vulgare*.

[J.C. COSTA & ARSÉNIO]

Viburno tini-Quercetum broteroanae (Br.-Bl., P. Silva & Rozeira 1956) J.C. Costa, Capelo, Honrado, Aguiar & Lousã 2002 corr. J.C. Costa & Monteiro-Henriques hoc loco (60.3.8.)

[≡ *Viburno tini-Quercetum roboris* (Br.-Bl., P. Silva & Rozeira 1956) J.C. Costa, Capelo, Honrado, Aguiar & Lousã 2002] (*Quercus-Fagetea*, *Quercetalia roboris*, *Quercion pyrenaicae*, *Quercenion robori-pyrenaicae*)

In the locality (Avô) where the holotype relevé was collected, only *Quercus robur* subsp. *broteroana* occurs; *Quercus robur* subsp. *robur* was not observed.

[J.C. COSTA & MONTEIRO-HENRIQUES]

Violo riviniana-Agrostietum castellanae Capelo, J.C. Costa, Jardim, Sequeira, Lousã & Rivas-Martínez ass. nova hoc loco (45.1.9.)

[*Hypochaerido glabrae-Agrostietum castellanae* Capelo, J.C. Costa, Jardim, Sequeira, Lousã & Rivas-Martínez 2000. nom. inval. (art. 3b); *Violo riviniana-Agrostietum castellanae* J.C. Costa, Capelo, Jardim, Sequeira, Espírito-Santo, Lousã, Fontinha, Aguiar & Rivas-Martínez 2004 nom. inval. (art. 5)] (*Stipo giganteae-Agrostietea castellanae*, *Agrostietalia castellanae*, *Agrostion castellanae*)

Diagnosis: *Agrostis castellana* grassland in the high places of Madeira island, in temperate hyperoceanic, upper mesotemperate to supratemperate submediterranean, hyperhumid to ultrahyperhumid bioclimate. It results from the grazing of the perennial *Armerio maderensis-Parafestucetum albidae* or the annual *Leontodonto longirostris-Ornithopodietum perpusilli* and *Illecebro verticillatae-Lotetum parviflorae* communities. See Costa et al. (2004) table 25 p. 109.

Holotypus: Bica da Cana, 1460 m, 10 m²: Characteristic species: 4 *Agrostis castellana*, 2 *Viola riviniana*, 1 *Holcus lanatus*, 1 *Hypochaeris radicata*, 1 *Danthonia decumbens*, 1 *Luzula campestris*, 1 *Carex lamprocarpa*, + *Trifolium cernuum*; Companion species: 1 *Lotus parviflorus*, 1 *Plantago coronopus*, + *Aira praecox*, + *Aphanes australis*, + *Hypericum humifusum*, + *Ornithopus perpusillus*.

[CAPELO, J.C. COSTA, JARDIM, SEQUEIRA, LOUSÃ & RIVAS-MARTÍNEZ]



Fig 1 - In the foreground (areas of greater depth of water) *Nymphaeo albo-Nupharetum luteae* background *Caricetum pseudocypero-lusitanicae* (macrophytic vegetation).



Fig 2 - *Hyperico elodis-Rhynchosporetum modesti-lucenoi* (marshy areas with organic soils on sandy depressions and shallow water) in Sadensean and Coastal Vicentine, with a upper thermomediterranean dry superior bioclimate.



Fig 3 - *Bolboschoeno compacti-Scirpetum litoralis* Perennial community dominated by *Scirpus compactus* colonizing depressions and abandoned salines with a long inundated period by brackish waters. They are distributed for Southern of Tagus estuary.



Fig 4 - *Caricetum echinato-nigrae*. Peat bogs communities, poor in plant species with a high degree of coverage and several *Sphagnum*. Carpetan-Leonese and Western Orocantabrian orophilous community, in the orotemperate bioclimate, in the edges of the ponds in locals with shallow waters and deficient drainage.



Fig 5 - *Utriculario exoletae-Sphagnetum auriculati*. Community from Sadensean and Coastal Vicentine districts, with upper thermomediterranean dry superior bioclimate. The presence of this community is due to the permanence of shallow water throughout the year inside of sandy depressions with organic soils.



Fig. 6 - Foreground: *Elytrigietum junceo-boreoatlanticae*; background: *Loto cretici-Ammophiletum arundinaceae*. The former colonizes wind eroded sand dunes south of Cape Mondego, being characterized by *Elytrigia juncea* and *Elytrigia boreoatlantica*. The latter colonizes Mediterranean active dunes (white dune) south of Cape Mondego and is characterized by *Lotus creticus* and *Ammophila arundinacea*.



Fig 7 - In the foreground *Euphorbio paraliae-Elytrigietum boreoatlanticae* (north of Cape Mondego, vicarious of *Elytrigietum junceo-boreoatlanticae*); background: *Otantho maritimi-Ammophiletum arundinaceae* (north of Cape Mondego, vicarious of *Loto cretici-Ammophiletum arundinaceae*).



Fig. 8 - *Sporoboletum arenarii* Mediterranean graminoid open community, on littoral salty sand accumulations, inundated with marine waters during equinoctial tides. This association is dominated by *Sporobolus arenarius* and occurs in Algarve.



Fig. 9 - In the foreground (relatively stable dune or grey dune): *Artemisio crithmifoliae-Armerietum pungentis*; background (mobile dune tops): *Loto cretici-Ammophiletum arundinaceae*



Fig. 10 - *Dittrichietum maritimae* on Vincentine (SW Portugal) sea cliff edges, dominated by the endemic chamaephyte *Dittrichia maritima*.



Fig. 11 - *Limonietum multifloro-virgati* limestone sea cliffs, from Peniche to Lisbon, populated by Portuguese endemic *Limonium multiflorum*, *Armeria cinerea* and *Daucus halophilus*.



Fig. 12 - *Daucus halophili-Astragaletum vicentini* a limestone community on sea cliff tops of Sagres Peninsula, characterized by the presence of Portuguese endemic *Astragalus vicentinus* and *Silene rothmaleri*.



Fig. 13 - *Azorinetum vidalii* Azorean sea cliffs association characterize by the endemic *Azorina vidalii*.



Fig. 14 - *Polygono equisetiformis-Juncetum maritimi* thermomediterranean rushes community, characterized by *Juncus maritimus*, *Juncus acutus* and *Polygonum equisetiforme*, between Guadalquivir and Mondego Rivers, in places with low to medium level of salinity, near water courses or in salt marshes that have been cultivated and then abandoned.



Fig.15 - *Puccinellio tenuifoliae-Limonietum plurisquamati* thermomediterranean subhumid chamaephytic association, on sandy-brackish soils, only occasionally touched by brackish water during equinoctial tides, characterized by *Limonium plurisquamatum*, *Puccinellia tenuifolia*, in Tornada River (Salir do Porto)



Fig. 16 - In the foreground *Puccinellio ibericae-Sarcocornietum perennis* background *Cistancho phelypaeae-Sarcocornietum fruticosae* and *Halimiono portulacoidis-Sarcocornietum alpine*: communities submitted to daily tidal flow.



Fig. 17 - Upper salt marshes: foreground *Inulo crithmoidis*-*Arthrocnemum macrostachyi* background *Cistancho phelypaeae*-*Suaedetum verae*.



Fig. 18 - *Triglochino maritimae*-*Sarcocornietum alpine* mesomediterranean halophytic community dominated by *Sarcocornia alpini*, *Triglochin maritima* and *Halimione portulacoides* in salt marshes north of the Tagus River, on sandy-silty zones, occasionally flooded by brackish water.



Fig. 19 - *Limonietum lanceolati* hemicryptophytic community, dominated by the Portuguese endemism *Limonium lanceolatum* accompanied by *Myriolimon ferulaceum*, on clayey or silty soils rich in schistose debris, only inundated during the highest tides, between Mira and Cerca Rivers (Aljezur) in Coastal Vincentine District.



Fig 20 - *Spartinetum maritimae* (left), *Puccinellio ibericae*-*Sarcocornietum perennis* and *Cistancho phelypaeae*-*Sarcocornietum fruticosae* (right) at Alvor lower salt marshes (Southern coast of Portugal) submitted to daily tidal flow.

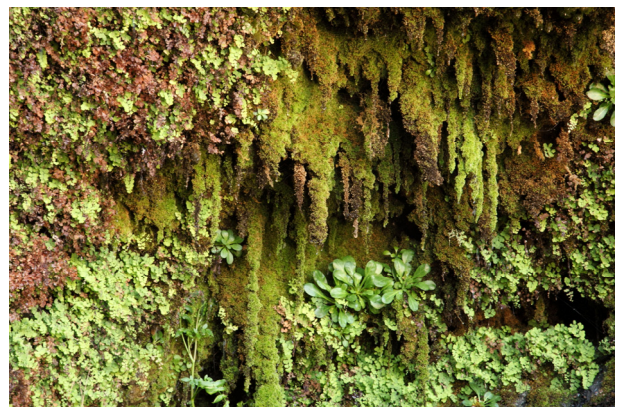


Fig 21 - *Didymodon spadiciei*-*Adiantetum capilli-veneris* community on sea cliffs carved out of predominantly acidic material of SW Alentejo (from Sines to Cape São Vicente), due to the numerous springs and water slowly drips, formed by *Adiantum capillus-veneris*, *Samolus valerandi*, *Didymodon spadicus* and *Eurhynchium speciosum*.



Fig 22 - *Adiantetum reniformis* rupicolous community on dry fissures of cliffs of Madeira and formed by *Adiantum reniforme*.



Fig 24 - *Musschiaetum aureae* community on pyroclasts and consolidate volcanic ashes in Madeira and characterized by *Musschia aurea*



Fig 25 - *Sedo nudi*-*Aeonietum glutinosi* Madeiran thermomediterranean dry to low subhumid rupicolous community, dominated by *Aeonium glutinosum*



Fig 23 - *Carici lowei*-*Woodwardietum radicans* mesotemperate humid to hyperhumid hyperoceanic community, dominated by *Woodwardia radicans*, on shadowy, terrigenous and moistly vertical walls, in Madeira Island



Fig. 26 - *Sinapidendro frutescentis*-*Aeonietum glandulosi* supratemperate hyperhumid Madeiran culminicolous community, characterized by *Aeonium glandulosum*, *Sinapidendron frutescens*, *Sedum farinosum*, *Tolpis macrorrhiza*, *Saxifraga pickeringii*, *Aeonium glutinosum*, *Micromeria cacuminicola*, *Arabis caucasica*.



Fig 27 - *Phalacrocarpo oppositifolii-Saxifragetum fragosoi* supramediterranean and supratemperate submediterranean subhumid to hyperhumid, Carpetan Leonese chasmochomophytic community, on shadowy terrigenous rocky walls, and characterized by *Saxifraga fragosoi*



Fig. 28 - *Santolinetum impressae* Sadensean psammophilous and subnitophilous community, dominated by the Lusitanian endemism *Santolina impressa*.

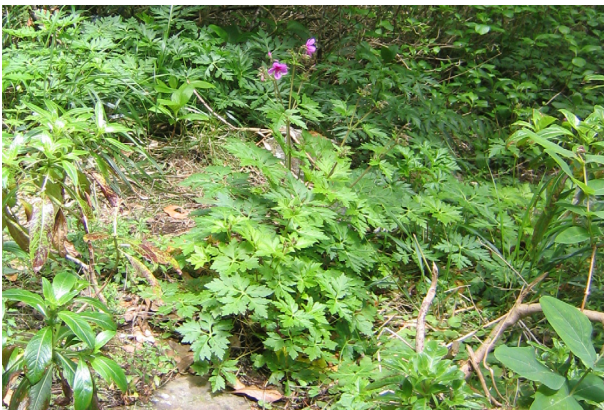


Fig. 29 - *Pericallido auritae-Geranietum palmatae* community of the fringes and clearings of *Clethro arboreo-Ocotetum foetentis*, characterized by *Geranium palmatum*, *Pericallis aurita*, *Ranunculus major*, *Dactylorhiza foliosa*, *Origanum virens*, *Rumex maderensis*.



Fig 30 - *Polytricho-Agrostietum truncatulae* orophilous grassland of the Montemuro and Marão mountains, on leptosols rich in sand and gravels derivate of granite, and formed by *Agrostis truncatula*, *Rumex angiocarpus*, *Corynephorus canescens*, *Centaurea herminii*, *Sedum arenarium* and the mosses *Polytrichum piliferum*, *Polytrichum juniperinum*, *Rachomitrium canescens*.



Fig.31 - *Centaureo ornatae-Festucetum duriotaganae* and *Salicetum atrocinerneo-australis*. The former is a xerophytic perennial community dominated by the endemic *Festuca duriotagana*, on wide crevices of granite and schist outcrops in torrential areas of the Tagus and Guadiana Rivers with incipient soils. The latter is formed by *Salix australis* and *Salix atrocinerea* on torrential beds of rivers south of the Tagus.

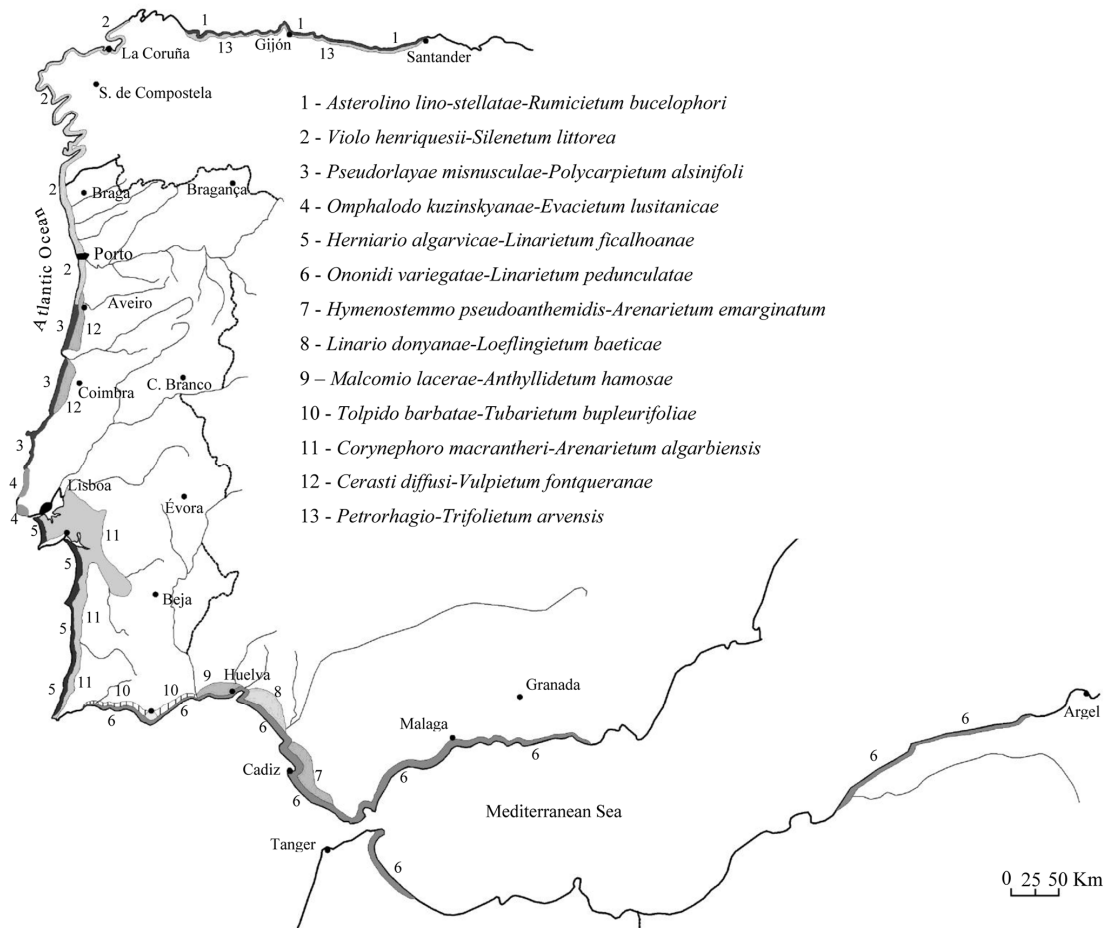


Fig. 32 - Distribution of dunes association of *Linarion pedunculatae*, *Hymenocarpus hamosi-Malcolmion trilobae* and *Thero-Airon* Iberian Peninsula and West of North Africa (taken from Costa et al. 2011a)



Fig 33 - *Herniario algarvicae-Linarietum ficlhoanae* annual thermomediterranean dry, Sadensean and Vincentine Coastal dunes, in the clearings of *Artemisio-Armerietum pungentis* (grey dune), and characterized by the Lusitanian endemism's *Linaria ficlhoana* and *Herniaria algarvica*



Fig. 34 - *Euphorbio transtaganae-Celticetum giganteae* thermo-mediterranean dry to subhumid, perennial grassland of *Celtica gigantea*, on deep sandy soils, in Sadensean and Coastal Vincentine territories.



Fig. 35 - *Agrostio castellanae-Arrhenatheretum bulbosi* hemicryptophytic grassland, cut or rarely grazed (during autumn and beginning of winter), harvested during summer, characterized by *Arrhenatherum bulbosum*, *Agrostis castellana*, *Chamaemelum nobile*, *Dactylis lusitanica*, *Anthoxanthum amarum*, in higher altitude of the Galician-Portuguese Sector (Montemuro, Leomil, Alvão and Barroso mountains).

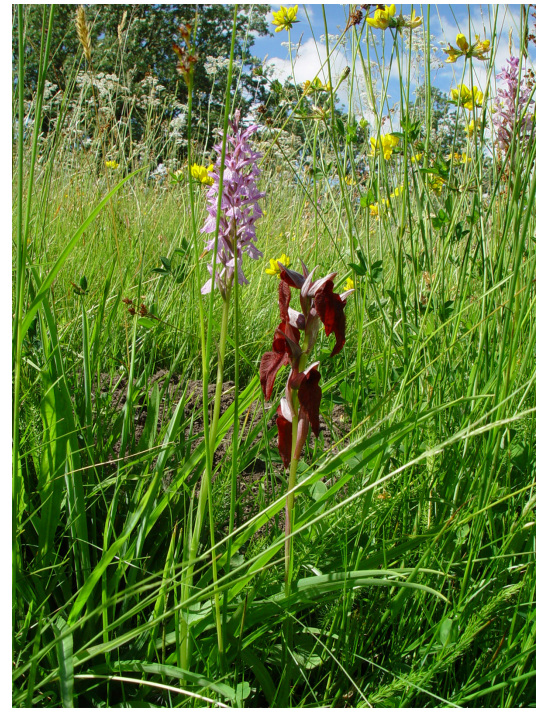


Fig.36 - *Anthemido nobilis-Cynosuretum cristati* mesophytic or mesohigrophytic grasslands pastured, formed by *Cynosurus cristatus*, *Anthoxanthum odoratum*, *Holcus lanatus*, *Plantago lanceolata*, *Trifolium pratense*, *Trifolium repens* and *Chamaemelum nobile*, *Dactylorhiza caramulensis*, in higher altitude of the Galician-Portuguese Sector

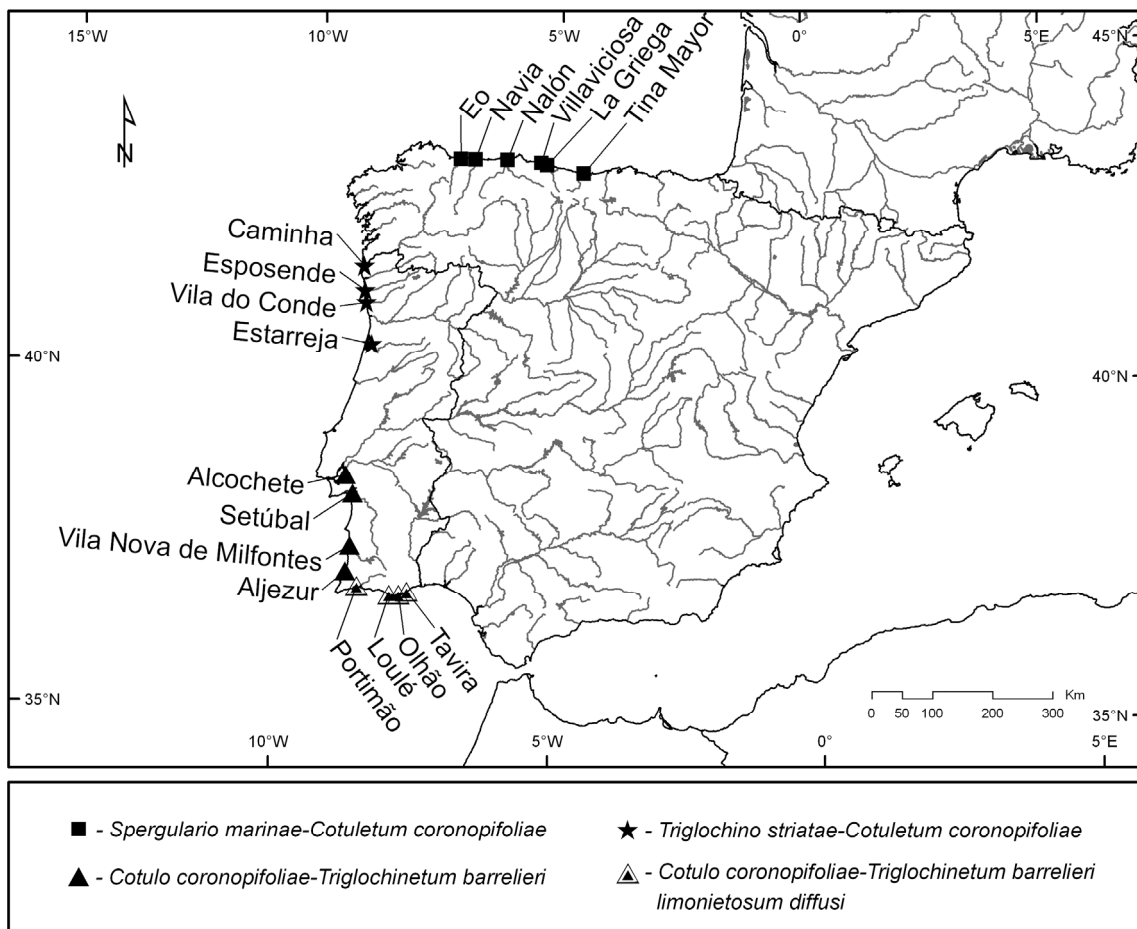


Fig.37 - Locations of *Cotula coronopifolia* communities (taken from Costa et al 2009)



Fig. 38 - *Genista anglicae-Nardetum strictae*. Shrubby/herbaceous community Western Carpetan and Estrelensean, supramediterranean and sub-temperate submediterranean, characterized by *Genista anglica* and *Nardus stricta*. It can occur as primary or secondary community in deep acid soils with prolonged hydromorphy or snow coverage and stagnic, gley or histic properties



Fig. 39 - *Pterosparto lasianthi-Ericetum aragonensis*. Supra-temperate submediterranean humid-hyperhumid heathland in Cantabrian-Leonese and Estrelensean territories.



Fig. 40 - *Erico umbellatae-Pterospartetum tridentate*. Shrubby community dominated by gorse and heather (*Erica umbellata*, *Pterospartum tridentatum* and *Ulex minor*) growing in mesomediterranean, punctually in thermotemperate (submediterranean), humid, in decapitated siliceous soils from the Beirensean Littoral and southern Galician-Portuguese territory, and is seral of *Viburno tini-Quercetum roboris*.



Fig. 41 - *Erico umbellatae-Ulicetum welwitschiani*. Nanophanerofitic/chamaephitic acidophilus community dominated by the Portuguese endemism *Ulex welwitschianus* in themomediterranean subhumid to dry bioclimate colonizing sandy soils and soils derived from acid sandstone or conglomerates. It occurs in Ribatagan-Sadensean and Coastal Vicentine territories and is seral of the *Asparago aphylli-Quercetum suberis* or *Aro neglecti-Quercetum suberis*.



Fig. 42 - *Genisto triacanthi-Cistetum palhinhae*. Shrubby community dominated by the Portuguese endemism *Cistus palhinhae*, thermomediterranean dry, on hidromorphic ferruginous leptosols (paleopozols - "orstein"). It is a permanent community or as seral of the *Quercu cocciferae-Juniperetum turbinatae* in the southwest of Portugal.



Fig. 43 - *Genisto triacanthi-Stauracanthetum vicentini*. Shrubby community dominated by the Portuguese endemism *Stauracanthus vicentinus* in silty or sandy soils or in decapitated podzols ("orstein"). It occurs in thermomediterranean dry to subhumid bioclimate, and is distributed in the southwest of Portugal.



Fig. 44 - *Genisto anglicae-Ericetum tetralicis*. Acid hygrophilous heathland with high coverage in oligotrophic waterlogging soils. It colonizes depressions with deficient drainage normally in planaltic zones, characterized by the presence of *Erica tetralix*, *Genista anglica*, *Genista micrantha* and *Calluna vulgaris* and also elements of *Nardetea* (*Potentilla erecta* and *Juncus squarrosus*).



Fig. 45 - *Cisto ladaniferi-Ulicetum argentei*. Shrubby community dominated by *Ulex argenteus* and *Cistus ladanifer*, silicicolous, thermo to mesomediterranean, dry to subhumid, in Monchique mountain. This community is seral of the *Lavandulo viridis-Quercetum suberis*.



Fig. 46 - *Phlomido purpureae-Cistetum albidii*. Camephitic/nanophaneritic community (garrigue) dominated by *Cistus albidus* growing in eroded soils derived from Jurassic limestones characterized by superficial stoniness. It occurs in thermomediterranean dry to subhumid bioclimate and are distributed through limestone occurrences in Algarve and Arrábida.



Fig.47 - *Celtico giganteo-Stauracanthetum vicentini*. Psamophilous nanophaneritic community dominated by *Stauracanthus vicentinus* and *Stipa gigantea*, accompanied by *Corema album*, *Halimium multiflorum*, *Lavandula lusitanica*, *Thymus camphoratus*, *Cistus palhinhae* in low thermomediterranean dry to subhumid from SW Portugal.



Fig. 48 - *Thymo camphorati-Stauracanthetum spectabilis*. Psamophilous community rich in endemic plants like *Thymus camphoratus*, *Stauracanthus spectabilis*, *Ulex welwitschianus*, *Malcolmia gracilima*. It occurs in low thermomediterranean dry to sub-humid bioclimate in Coastal Vicentine, and is seral of *Aro neglecti-Quercetum suberis*.



Fig. 49 - *Thymo capitellati-Stauracanthetum genistoidis*. Psamphilous community, rich in endemic plants (*Thymus capitellatus*, *Armeria rouyana*, *Armeria pinifolia*, *Ulex welwitschianus*, *Malcolmia gracilima*), in low thermomediterranean dry to subhumid bioclimate, with a Ribatagan-Sadensean distribution, and is seral of the *Aro neglecti-Quercetum suberis*



Fig. 50 - *Ulicetum erinacei*. Community formed by *Ulex erinaceus*, *Cistus palhinhae*, *Genista algarbiensis*, *Teucrium vicentinum* from lapias developed on surfaces of limestone in the Vicentine Promontory. It occurs on dry thermomediterranean bioclimate and is seral of the *Quercus cocciferae-Juniperetum turbinatae*.



Fig. 51 - *Thymo sylvestris-Ulicetum densi*. Chamaephytic (dwarf shrub) community on decarbonated soils derived from *terra rossa* (red clay soil produced by the weathering of limestone) in thermomediterranean dry to subhumid bioclimate. It presents an Arrabidensean distribution and is characterized by the presence of *Ulex densus*, *Thymus sylvestris*, *Sideritis hirsuta* var. *hirtula*. It is inserted into *Viburno tini-Quercus rivamartinezii* S. and *Quercus cocciferae-Juniperetum turbinatae* S.

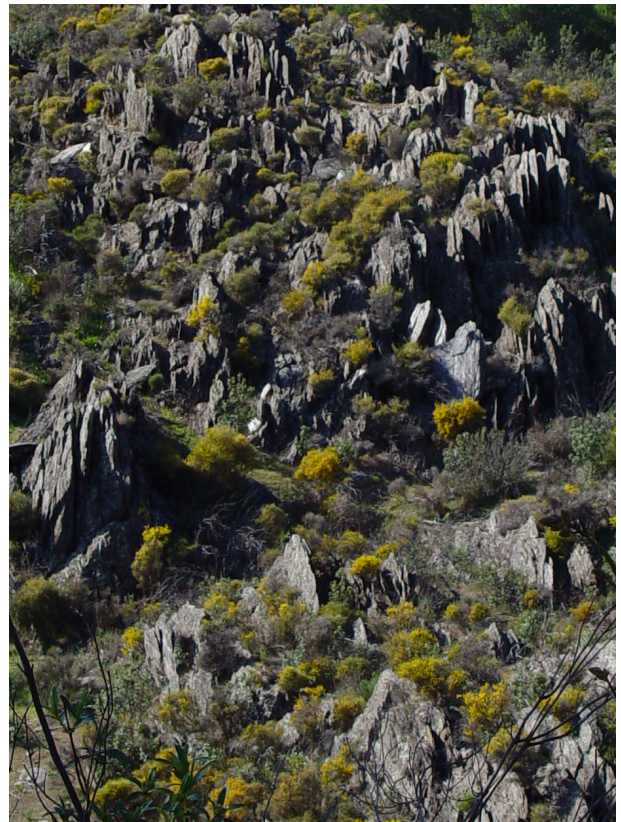


Fig. 52 - *Genistetum polyanthi* Community dominated by *Genista polyanthus*, on rocky places of the Aracenean territories. It is a permanent community or seral of *Myrto-Quercus rotundifoliae* S. or *Phlomidio purpureo-Juniperetum turbinatae* S.



Fig. 53 - *Echinopartetum iberici*. Pulviniform nanophanerophytic Estrelensean, orotemperate hyperhumid to ultrahyperhumid association, that develops as a permanent community on leptosols and occupies the interstices of granitic rocks and characterized by *Echinopartum ibericum*.



Fig. 54 - In the foreground *Lavandulo sampaioanae-Cytisetum multiflori* background *Holco mollis-Quercetum pyrenaicae*. The *Holco-Quercetum pyrenaicae* is a forestry acidophilus community, supratemperate submediterranean humid to hyperhumid dominated by *Quercus pyrenaica*, growing on oligotrophic deep soils, in northwest of Portugal. The *Lavandulo sampaioanae-Cytisetum multiflori* is dominated by *Cytisus multiflorus* and *Cytisus striatus* and constitutes a substitution step or the edge of the *Holco-Quercetum pyrenaicae*.



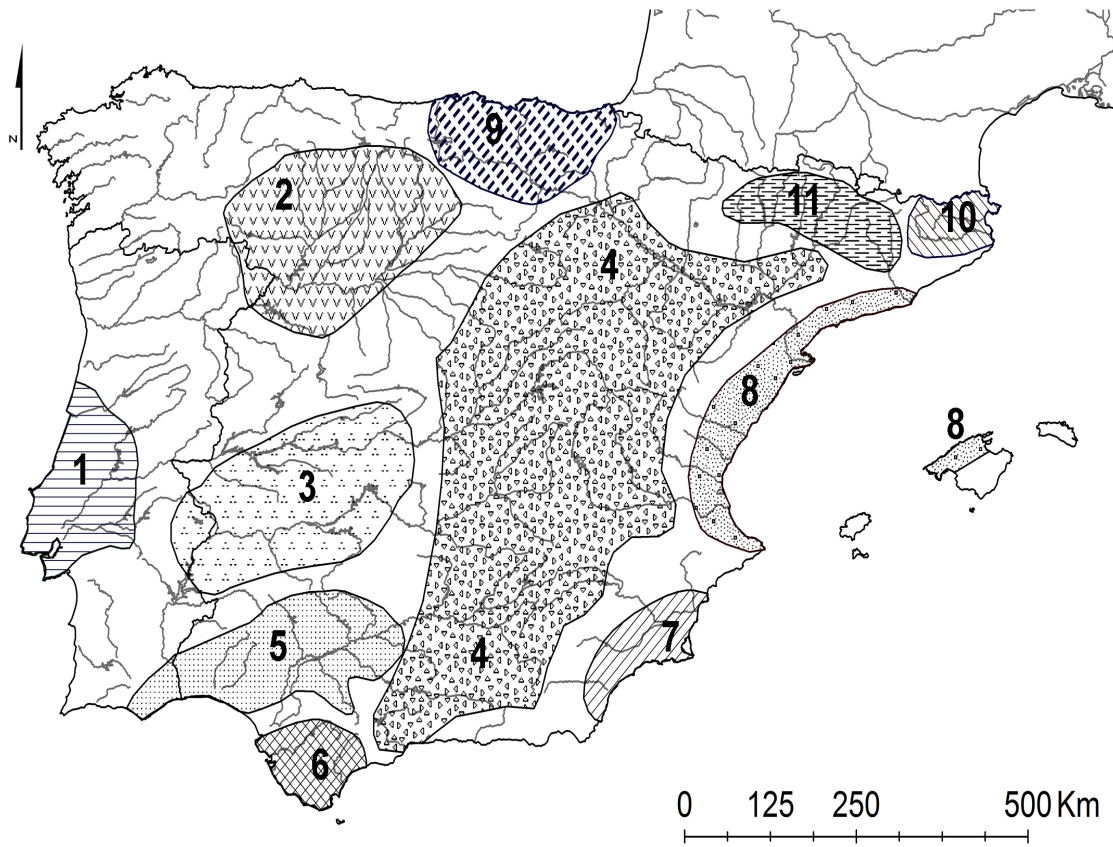
Fig. 56 - In the foreground inside water *Polygono equisetiformis-Tamaricetum africanae* background *Oenanthe crocatae-Nerietum oleandri* and *Ficario ranunculoidis-Fraxinetum angustifoliae* in a tributary of Guadiana River (lower Guadiana – South Portugal).



Fig. 55 - *Viti sylvestris-Salicetum atrocineae*. Thermo-mediterranean willow forest dominated by *Salix atrocineae* on oligotrophic and gleyed sandy soils, temporarily inundated.



Fig. 57 – In the foreground *Pyro bourgaeanae-Flueggeetum tinctoriae* background *Ficario ranunculoidis-Fraxinetum angustifoliae*, in Guadiana basin (Herdade da Contenda).



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Fig. 58 - Distribution of Iberian associations of *Populion albae*: 1: *Clematido campaniflorae-Salicetum neutrichae* 2: *Populo nigrae-Salicetum neutrichae* 3: *Salici atrocineriae-Populetum albae* 4: *Rubio tinctorum-Populetum albae* 5: *Nerio oleandri-Populetum albae* 6: *Crataego brevispinae-Populetum albae* 7: *Lonicero biflorae-Populetum albae* 8: *Vinco-Populetum albae* 9: *Humulo lupuli-Alnetum glutinosae* 10: *Populetum albae* 11: *Carici pendulae-Salicetum atrocineriae* (taken from Costa et al. 2011).



Fig. 59 – *Clematido campaniflorae-Salicetum neutrichae*. Forests dominated by *Salix neutricha*, and *Populus alba* along watercourses where the receptor basin is situated mostly in the hills of the Estremenho Limestone Massif or is fed water from water springs situated in substrata of Jurassic and Cretaceous age, extending over the biogeographical territories of the Sadensean-Dividing Portuguese subprovince in thermo to mesomediterranean.



Fig. 60 – *Frangulo alni-Prunetum lusitanicae*. *Prunus lusitanica* temporio-hygrophilous mesoforest, growing over metasediments rocky places on valleys with a high slopes, in mesomediterranean humid hyperoceanic bioclimate of the Littoral Beirensean mountains.



Fig. 61 – *Scrophulario scorodoniae-Alnetum glutinosae*. Alder forest with a thermo to mesomediterranean bioclimate with a high Atlantic influence, growing in oligotrophic river banks. Its requires soils with high moisture and because of this, they are absent in the watercourses with a dry period in summer.



Fig. 62 - *Pteridio aquilinis-Ericetum azoricae*. Seral thicket and heat mantle community of temperate Azorean Laurisilva, dominated by *Erica azorica*.



Fig. 63 - *Lycopodio clavati-Juniperetum nanae*. Nanophanerophytic, climatophilous, culmicolous and silicicolous community, caracterizad by *Juniperus alpina*, growing in Estrelensean territory, in orotemperate, submediterranean, ultra-hyperhumid bioclimate.



Fig. 64 - *Arisaro simorrhini-Quercetum broteroi*. Marcescent climatophilous forest of *Quercus broteroi*, in meso to thermomediterranean, humid to subhumid. Dividing Portuguese and Arrabidensean distribution on deep luvisols developed from limestone and marls.



Fig. 65 - *Lonicero implexae-Quercetum rotundifoliae*. Holm oak groves dominated by *Quercus rotundifolia* from carsic limestone, in mesomediterranean subhumid to humid bioclimate and with a Sadensean-Dividing Portuguese distribution.



Fig. 66 - *Rusco aculeati-Juniperetum lagunae*. Mixed meso-forest of *Quercus rotundifolia* and *Juniperus lagunae* with an open tree stratum (rarely dense) that are climatophilous in the Lusitano Duriense sector (Douro valley and tributaries from orient of the river Tua). It colonizes luvisols, cambisols, or regosols derived from acid rocks. This community colonizes territories with high continentality in Portugal (semicontinental) and dry mesomediterranean bioclimate.



Fig. 68 - *Viburno tini-Quercetum rivasmartinezii* Thermo-mediterranean subhumid forest of *Quercus coccifera* subsp. *rivasmartinezii* on limestones of Arrábida mountain.



Fig. 70 - *Quercus cocciferae-Juniperetum turbinatae*. Juniper association on the sea cliffs south of Mondego Cap. Normally it is a permanent community due to the edaphoxerophyte characteristics of the biotopes and because of the direct sea influence (salt spray, wind and humidity). It can also be seral of *Viburno tini-Quercetum rivasmartinezii*.



Fig. 67 - *Lavandulo viridis-Quercetum suberis*. Thermo-mesomediterranean sub-humid to humid *Quercus suberis* forest in South and Southwest of Portugal.



Fig. 69 - *Convolvulo fernandesii-Euphorbietum pedroi*. A very rare community from limestone sea cliffs, in thermo-mediterranean dry bioclimate of Occidental Arrábida. It is dominated by the Lusitanian endemism *Euphorbia pedroi*. This *Euphorbia* is unique in Portugal continental for its size (nanophanerophyte) reminding some of the phanerophytes of the genus *Euphorbia* in the macaronesian islands and Palearctic region.



Fig. 71 - *Daphno gnidii-Juniperetum navicularis*. Microphanerofitic community that colonizes the inland dunes (old Quaternary dunes) sometimes with podzolized soils and always with a deep groundwater table, constitute the most developed stage of the vegetation. They are characterized by the Sadensean and Coastal Vicentine endemism *Juniperus navicularis*.



Fig. 72 - *Osyrio quadripartitae-Juniperetum turbinatae*. Microphanerofitic community dominated by *Juniperus tubinata* that colonizes the green dunes (stabilized dune) south of Mondego Cap. This association constitutes the most developed stage of the vegetation in the coastal sand dunes submitted to the marine salt-spray.



Fig. 73 - *Rubio longifoliae-Coremetum albi*. Constitutes a seral stage of the microphanerofitic community *Osyrio quadripartitae-Juniperetum turbinatae* and occupy the same biotope. Sometimes they represent the natural edge of the juniper formation.

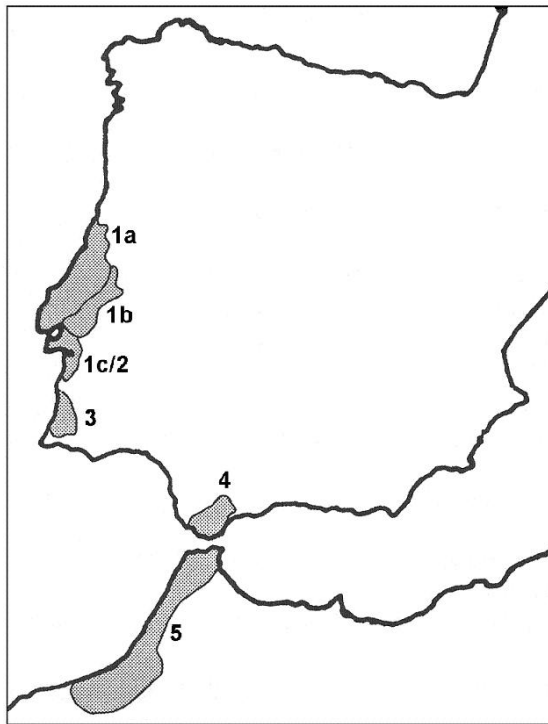


Fig. 74 - Distribution of *Quercion lusitanicae* syntaxa:

1. *Erico scopariae-Quercetum lusitanicae*:
 - 1a: *quercetosum lusitanicae*
 - 1b: *ulicetosum airensis*
 - 1c: *ulicetosum wehwitschiani*
 2. *Junipero navicularis-Quercetum lusitanicae*
 3. *Centaureo crocatae-Quercetum lusitanicae*
 4. *Senecioni lopezii-Quercetum lusitanicae*
 5. *Phillyreo angustifoliae-Quercetum lusitanicae*
- (Adapted from Capelo et al. 2002)



Fig.75 - *Holco mollis-Quercetum pyrenaicae*. Marcescent supratemperate humid forest of *Quercus pyrenaica* in northwest mountains of Portugal



Fig. 76 - *Pyro bourgeanae-Quercetum pyrenaicae*. Oak forest of *Quercus pyrenaica* and *Pyro bourgeana*, in meso-mediterranean to low supramediterranean dry superior to low subhumid, in Lusitan-Extremadurean territories. They colonize soils derived from acid rocks.



Fig. 77 - *Viburno tini-Quercetum broteroanae*. Semi-deciduous *Quercus robur* subsp. *broteroana* meso-macroforest, on deep mesic soils, from metasediments and granitoid rocks, in lower mesomediterranean or thermotemperate submediterranean humid hyperoceanic bioclimate, of the Littoral Beirensean and Miniensien districts.



Fig. 78 - *Saxifrago spathularis-Betuletum celtibericae*. Climatophilous open forestry from Estrela Mountain, dominated by the birch *Betula celtiberica*, in orotemperate, sub-mediterranean, hiperhumid to ultrahiperhumid bioclimate.



Fig. 79 - *Mayteno umbellatae-Oleetum maderensis* (in left) and *Euphorbietum piscatoriae* (in right). The former is an *Olea maderensis* forest (accompanied by *Maytenus umbellata*, *Globularia salicina* and *Chamaemeles coriacea*) that represents the top of the series in the inframediterranean dry bioclimate. They colonize the vertisols and cambisols exclusive from the lower altitudes and cliffs of the southern slopes of the island (between 0 and 200 m). The more important and dominant replacement step is the community of *Euphorbietum piscatoriae* that occurs in abandoned agricultural fields or in moderately deep soils. *Euphorbia piscatoria*, *Globularia salicina* and *Echium nervosum* are the dominant species.



Fig. 80 - *Globulario salicinae-Ericetum canariensis*. *Erica canariensis*, *Erica maderenicola* and *Myrica faya* community, on leptosols in thermomediterranean dry to subhumid in Madeiran subprovince, and seral of *Semele androgynae-Apollonietum barbujanae*.



Fig. 82 - *Clethro arboreae-Ocoteetum foetentis*. Climato-philous mesofitic forest, dominated by *Ocotea foetens* and *Laurus novocanariensis*, in mesotemperate, occasionally in upper mesomediterranean humid to hiperhumid of Madeira Island. This forest reaches 30 m height.



Fig. 81- *Argyranthemo montani-Ericetum maderensis*. Heather of *Erica maderensis* and *Teline maderensis*, often in permanent positions (basaltic crests and cliffs), can be also as a replacement stage of the *Polysticho falcinelli-Ericetum arboreae*. Present a supramediterranean, hiperhumid to ultrahiperhumid bioclimate in Madeira Island.



Fig. 83 - *Vaccinio padifolii-Ericetum maderinicolae*. Arbooreal heath from Madeira island, dominated by *Erica maderinicola* and *Erica canariensis*, mesotemperate, submediterranean partially mesomediterranean, humid to hiperhumid. In primary positions (edaphoxerophytic positions) it can form the potential natural vegetation. Sometimes it can form the edge of the *Clethro-Ocoteetum* forests.



Fig. 84 - *Helichryso melaleuci-Sideroxyletum marmulano*. Microphanerophitic community of *Sideroxylum marmulano*, in inframediterranean subhumid bioclimate, in Madeira and Porto Santo. The floristic composition combines elements of *Rhamno-Oleetea cerasiformis* and *Pruno-Lauretea novocanariensis*.



Fig. 86 - *Polysticho falcinelli-Ericetum canariensis*. Microforest dominated by *Erica canariensis* and *Erica madericola* that can reach 10-12m of high and 60-70 cm of diameter, in upper mesotemperate (submediterranean) hiperhumid to ultrahiperhumid, in Madeira Island. *Sorbus maderensis*, *Polystichum falcinellum*, *Ranunculus minor*, *Viola riviniana*, are species that occurs in this community.



Fig. 85 - *Semele androgynae-Apollonietum barbujanae*. Forest community from Madeira Island, thermometiterranean upper subhumid to humid dominated by *Apollonias barbujana* and *Laurus novocanariensis*, with thermophilous elements like *Ilex canariensis*, *Hypericum grandifolium*, *Teucrium betonicum*, and climbers *Semele androgyna*, *Smilax pendulina*, *Hedera maderensis*, *Rubia agostinhoi*, *Smilax canariensis*.



Fig. 87 - *Isoplexido sceptri-Euphorbietum melliferae*. Microphyllous cauliroslate community, endemic from Madeira Island., on rocky basaltic walls, in mesotemperate to low supratemperate, humid to hiper-humid. It occurs in Laurisilva clearances or places submitted to landslides in ambience of the *Clethro arboreae-Ocoteetum foetentis*. *Euphorbia mellifera*, *Isoplexis sceptrum*, *Sonchus fruticosus*, *Melanoselinum decipiens*, *Musschia wollastonii* are species characteristics of this community.

ANNEX II

NEW COMBINATION TAXA NAMES

Quercus x coutinhoi Samp. nothosubsp. ***duriensis*** (Franco & Vasc.) Monteiro-Henriques, J. C. Costa, A. Bellu, T. Vasconcelos & Aguiar comb. & stat. nov.

[Basion.: *Quercus x coutinhoi* Samp. f. *duriensis* Franco & Vasc. in Anais Inst. Sup. Agron. 21: 33-34 1954] = *Quercus faginea* subsp. *faginea* x *Quercus robur* subsp. *broteroana* (fig. 88).



Fig. 88- *Quercus x coutinhoi* Samp. nothosubsp. *duriensis*

Quercus x andegavensis Hy nothosubsp. ***subandegavensis*** (A. Camus) Vila-Viçosa, F.M. Vázquez, Meireles & Pinto-Gomes comb. & stat. nov.

[Basion.: *Quercus x subandegavensis* A. Camus in Les Chênes, Monogr. Gen. Quercus, Atlas ii. Expl. Pl. (Encycl. Econ. Sylv. vii.) 60 1935] = *Quercus pyrenaica* x *Quercus robur* subsp. *estremadurensis*.

ANNEX III

FLORISTIC CATALOGUE

In the following, we present an alphabetic list of the characteristic taxa; for each taxon we mention the syntaxon for which it is characteristic or in which it has its optimum. This catalogue contains 2930 taxa.

Acer campestre L. (*Quercus-Fagetea*)

Acer monspessulanum L. (*Quercetalia pubescenti-petraeae*)

Acer platanoides L. (*Tilio platyphylli-Acerion pseudoplatani*)

Acer pseudoplatanus L. (*Betulo pendulae-Populetalia tremulae*)

Aceras anthropophorum (L.) Aiton f. (*Festuco-Brometea*)

Achillea ageratum L. (*Holoschoenetalia vulgaris*)

Achillea millefolium L. (*Arrhenatheretalia elatioris*)

Achyranthes sicula (L.) All. (*Achyrantho siculae-Bidentetum pilosae*)

Acinos alpinus (L.) Moench subsp. ***meridionalis*** (Nyman) P.W. Ball (*Rosmarinetea officinalis*)

Acinos meridionalis (see *Acinos alpinus* subsp. *meridionalis*)

Aconitum napellus L. subsp. ***lusitanicum*** Rouy (*Populetalia albae*)

Adenocarpus anisochilus Boiss. (*Ulici europaei-Cytision striati*)

Adenocarpus argyrophyllus (Rivas Goday) Caball. (*Genistion floridae*)

Adenocarpus aureus (Cav.) Pau subsp. ***aureus*** (*Retamion sphaerocarphae*)

Adenocarpus complicatus (L.) J. Gay (*Cytisetea-scopario striati*)

Adenocarpus gredensis (see *Adenocarpus hispanicus* subsp. *gredensis*)

Adenocarpus hispanicus (Lam.) DC. subsp. ***gredensis*** Rivas-Martínez & Belmonte (*Genistion floridae*)

Adenocarpus lainzii Castrov. (*Cytisetalia-scopario striati*)

Adenocarpus telonensis (Loisel) DC. (*Cytisetea-scopario striati*)

Adiantum capillus-veneris L. (*Adiantetalia capilli-veneris*)

Adiantum pusillum (see *Adiantum reniforme* subsp. *pusillum*)

Adiantum reniforme L. subsp. ***pusillum*** (Bolle) Rivas Mart. (*Cheilanthon pulchellae*)

Adiantum reniforme L. subsp. ***reniforme*** (*Cheilanthon pulchellae*)

Adonis annua L. (*Ridolfion segeti*)

Adonis microcarpa DC. (*Roemerion hybridae*)

Adonis squarrosa (see *Adonis annua* subsp. *squarrosa*)

Aegilops geniculata Roth (*Taeniathero-Aegilopion geniculatae*)

Aegilops neglecta Req. ex Bertol. (*Taeniathero-Aegilopion geniculatae*)

Aegilops triuncialis L. (*Taeniathero-Aegilopion geniculatae*)

Aeonium glandulosum (Aiton) Webb & Berthel. (*Sinapidendro angustifolii-Aeonion glutinosi*)

Aeonium glutinosum (Aiton) Webb & Berthel. (*Sinapidendro angustifolii-Aeonion glutinosi*)

Aeonium x meyerheimii Bolle (*Sinapidendro angustifolii-Aeonion glutinosi*)

Aetheorhiza bulbosa (L.) Cass. subsp. ***bulbosa*** (*Crucianellalia maritima*)

Ageratina adenophora (Spreng.) King & Robins. (*Ageratinio adenophorae-Ipomaeion acuminatae*)

Ageratina riparia (Regel) King & Robins. (*Ageratinio adenophorae-Ipomaeion acuminatae*)

Agrimonia eupatoria L. (*Trifolio medii-Geranietea sanguinei*)

Agrimonia procera Wallr. (*Origanetalia vulgaris*)

Agropyron junceum subsp. ***boreoatlanticus*** (see *Elytrigia juncea* subsp. *boreoatlantica*)

Agropyron junceum (see *Elytrigia juncea* subsp. *juncea*)

Agropyron pungens (see *Elytrigia atherica*)

Agropyron repens (see *Elytrigia repens*)

Agrostemma githago L. (*Centaureetalia cyani*)

Agrostis azorica (Hochst. ex Seub.) Tutin & E.F. Warb. (*Tolpido azoricae-Holcetea rigidi*)

Agrostis botelhoi (see *Agrostis reuteri* subsp. *botelhoi*)

Agrostis canina L. subsp. ***canina*** (*Caricetalia nigrae*)

Agrostis capillaris L. (*Molinio-Arrhenatheretea*)

Agrostis castellana Boiss. & Reut. (*Stipo-Agrostietea castellananae*)

Agrostis commista (see *Agrostis truncatula* subsp. *commista*)

Agrostis congestiflora Tutin E. F. Warburg subsp. ***congestiflora*** (*Tolpido succulentae-Agrostion congestiflorae*)

Agrostis congestiflora Tutin E. F. Warburg subsp. ***oreophila*** Franco (*Festucion francoi*)

Agrostis curtisii Kerguelén (*Calluno-Ulicetea*)

Agrostis durieui Boiss. & Reut. (*Sedion pyrenaici*)

Agrostis gracililaxa Franco (*Tolpido azoricae-Holcetea rigidi*)

Agrostis hesperica Romero Garcia, Blanca & Morales Torres (*Anagallido-Juncion bulbosi*)

Agrostis nebulosa Boiss. & Reut. (*Hordeion marini*)

Agrostis obtusissima Hack (*Deschampsio maderensis-Parafestucion albidae*)

Agrostis oreophila (see *Agrostis azorica* subsp. *oreophila*)

Agrostis pourretii Willd. (*Agrostion pourretii*)

Agrostis pseudopungens (see *Agrostis stolonifera* var. *pseudopungens*)

Agrostis reuteri Boiss. subsp. ***botelhoi*** Rocha Afonso & Franco (*Festucion francoi*)

Agrostis reuteri Boiss. subsp. ***reuteri*** (*Brizo-Holoschoenion*)

Agrostis scabriglumis (see *Agrostis stolonifera* var. *scabriglumis*)

- Agrostis stolonifera* L. var. **pseudopungens** (Lange) Kerguelen (*Elytrigion athericae*)
- Agrostis stolonifera* L. var. **scabriglumis** (Boiss. & Reuter) C.E. Hubbard (*Plantaginetalia majoris*)
- Agrostis stolonifera* L. var. **stolonifera** (*Plantaginetalia majoris*)
- Agrostis tenerrima* Trin. (*Malcolmietalia*)
- Agrostis truncatula* Parl. subsp. **commista** Castrov. & Charpin (*Sedion pyrenaici*)
- Agrostis truncatula* Parl. subsp. **truncatula** (*Hieracio castellani-Plantaginon radicatae*)
- Agrostis x fouilladei* P. Fourn. (*Molinio-Arrhenatheretea*)
- Aichryson divaricatum* (Aiton) Pragaer (*Aichryso laxi-Monanthion laxiflorae*)
- Aichryson dumosum* (Lowe) Praeger (*Aichryso laxi-Monanthion laxiflorae*)
- Aichryson villosum* (Aiton) Webb & Berthel. (*Aichryso laxi-Monanthion laxiflorae*)
- Aira caryophyllea* L. subsp. **caryophyllea** (*Tuberarietalia guttatae*)
- Aira caryophyllea* L. subsp. **multiculmis** (Dumort.) Bonnier & Layens (*Thero-Airion*)
- Aira cupaniana* Guss. (*Tuberarietalia guttatae*)
- Aira multiculmis* (see *Aira caryophyllea* subsp. *multiculmis*)
- Aira praecox* L. (*Thero-Airion*)
- Airopsis tenella* (Cav.) Asch. Graebn. (*Evacenion carpetanae*)
- Aizoon canariense* L. (*Mesembryanthemion crystallini*)
- Ajuga chamaepitys* (L.) Schreb. (*Stellarietea mediae*)
- Ajuga iva* (L.) Schreb. (*Brachypodietalia distachyi*)
- Ajuga meonantha* (see *Ajuga pyramidalis* subsp. *meonantha*)
- Ajuga pyramidalis* L. subsp. **meonantha** (Hoffmanns & Link) (*Nardetalia strictae*)
- Ajuga pyramidalis* L. subsp. **pyramidalis** (*Nardetalia strictae*)
- Ajuga reptans* L. (*Quercu-Fagetea*)
- Alchemilla transiens* (Buser) Buser (*Saxifragion willkommianae*)
- Alisma lanceolatum* With (*Nasturtio-Glycerietalia*)
- Alisma plantago-aquatica* L. (*Magno-Carici elatae-Phragmitetea australis*)
- Alliaria petiolata* (M. Bieb.) Cavara & Grande (*Galio aparines-Alliarietalia petiolatae*)
- Allium ampeloprasum* L. (*Onopordenea acanthii*)
- Allium ericetorum* Thore (*Calluno-Ulicetea*)
- Allium guttatum* Steven subsp. **sardoum** (Moris) Stearn L. (*Agrostietalia castellanae*)
- Allium massaessylum* Batt. & Trab. (*Quercenion pyrenaicae*)
- Allium oleraceum* L. (*Trifolio medii-Geranietea sanguinei*)
- Allium pallens* L. (*Lygeo-Stipetea*)
- Allium paniculatum* L. (*Brachypodietalia phoenicoidis*)
- Allium roseum* L. (*Brachypodietalia phoenicoidis*)
- Allium sardoum* (see *Allium guttatum* subsp. *sardoum*)
- Allium scorzonerifolium* Desf. in Redouté (*Agrostion pourretii*)
- Allium sphaerocephalon* L. (*Lygeo-Stipetea*)
- Allium subvillosum* Salzm. ex Schult. & Schult. f. (*Hyparrhenion sinaicae*)
- Allium triquetrum* L. (*Smyrnienion olusatri*)
- Allium victorialis* L. (*Galio-Urticetea*)
- Allium vineale* L. (*Brachypodietalia phoenicoidis*)
- Alnus glutinosa* (L.) Gaertn. (*Salici purpureae-Populetea nigrae*)
- Alopecurus aequalis* Solob. (*Bidenton tripartitae*)
- Alopecurus arundinaceus* Poir. (*Molinio-Arrhenatheretea*)
- Alopecurus geniculatus* L. (*Agrostion stoloniferae*)
- Alopecurus myosuroides* Huds. (*Centaureetalia cyani*)
- Alopecurus pratensis* L. (*Molinio-Arrhenatheretea*)
- Alternanthera caracasana* Humb., Bonpl. & Kunth (*Chamaesyction prostratae*)
- Althaea cannabina* L. (*Brachypodietalia phoenicoidis*)
- Althaea hirsuta* L. (*Stellarietea mediae*)
- Althaea longiflora* Boiss. & Reut. (*Thero-Brometalia*)
- Althaea officinalis* L. (*Magno-Caricion elatae*)
- Alyssum alyssoides* (L.) L. (*Brachypodietalia distachyi*)
- Alyssum granatense* Boiss. & Reut. (*Alyso granatensis-Brassicion barrelieri*)
- Alyssum lusitanicum* (see *Alyssum serpyllifolium* subsp. *lusitanicum*)
- Alyssum minutum* DC. (*Tuberarietea guttatae*)
- Alyssum pintodasilva* (see *Alyssum serpyllifolium* subsp. *lusitanicum*)
- Alyssum serpyllifolium* Desf. subsp. **lusitanicum** Dudley & P. Silva (*Artemisio glutinosae-Santolinion rosmarinifoliae*)
- Alyssum simplex* Rudolphi (*Tuberarietea guttatae*)
- Amaranthus albus* L. (*Solano nigri-Polygonetalia convolvuli*)
- Amaranthus blitoides* S. Watson (*Chenopodietalia muralis*)
- Amaranthus cruentus* L. (*Solano nigri-Polygonetalia convolvuli*)
- Amaranthus deflexus* L. (*Chenopodietalia muralis*)
- Amaranthus graecizans* L. (*Chenopodietalia muralis*)
- Amaranthus hybridus* L. (*Solano nigri-Polygonetalia convolvuli*)
- Amaranthus hypochondriacus* L. (*Chenopodietalia muralis*)
- Amaranthus muricatus* Moq. in A. DC (*Chenopodion muralis*)
- Amaranthus retroflexus* L. (*Stellarietea mediae*)
- Amaranthus viridis* L. (*Chenopodion muralis*)
- Amelanchier ovalis* Medik. (*Rhamno-Prunetea*)
- Ammannia coccinea* Rottb. (*Oryzo sativae-Echinochloion oryzoidis*)
- Ammi majus* L. (*Stellarietea mediae*)
- Ammi subertianum* (Wats.) Trelease (*Pericallion malvifoliae*)
- Ammi trifoliatum* (Wats.) Trelease (*Pericallion malvifoliae*)
- Ammi visnaga* (L.) Lam. (*Solano nigri-Polygonetalia convolvuli*)
- Ammoides pusilla* (Brot.) Breistr. (*Brachypodietalia distachyi*)
- Ammophila arenaria* (L.) Link subsp. **arundinacea** H. Lindb. f. (*Ammophilenion arundinaceae*)
- Ammophila arenaria* subsp. *australis* (see *Ammophila arenaria* subsp. *arundinacea*)
- Anacamptis pyramidalis* (L.) L.C.M. Richard (*Festuco-Brometea*)
- Anacyclus clavatus* (Desf.) Pers. (*Hordeion leporini*)
- Anacyclus radiatus* Lois. (*Hordeion leporini*)
- Anagallis arvensis* L. (*Stellarietea mediae*)
- Anagallis foemina* Mill (*Stellarietea mediae*)
- Anagallis linifolia* (see *Anagallis monelli* var. *linifolia*)
- Anagallis microphylla* (see *Anagallis monelli* var. *microphylla*)
- Anagallis monelli* L. var. **linifolia** (L.) Samp. (*Corynephorion maritimi*)
- Anagallis monelli* L. var. **microphylla** (Ball) Vasc. (*Corynephorion maritimi*)
- Anagallis tenella* (L.) L. (*Anagallido-Juncion bulbosi*)
- Anagyris foetida* L. (*Pistacio lentisci-Rhamnetalia alaterni*)
- Anarrhinum bellidifolium* (L.) Willd. (*Phagnalo saxatilis-Rumicetalia indurati*)
- Anarrhinum duriminium* Brot. (*Phagnalo saxatilis-Rumicetalia indurati*)
- Anarrhinum longipedicellatum* R. Fern. (*Sesamoidion suffruticosae*)
- Anchusa arvensis* (L.) M. Bieb. (*Polygono-Chenopodion polyspermi*)
- Anchusa italica* Retz. (*Roemerion hybridae*)
- Andropogon distachyos* L. (*Hyparrhenion sinaicae*)
- Andryala arenaria* (DC.) Boiss. & Reut. (*Alyso granatensis-Brassicion barrelieri*)
- Andryala corymbosa* (see *Andryala integrifolia* var. *corymbosa*)
- Andryala crithmifolia* Aiton (*Sinapidendro angustifolii-Aeonion glutinosi*)

- Andryala integrifolia** L. var. **corymbosa** (Lam.) Willd. (*Tuberarietalia guttatae*)
- Andryala integrifolia** L. var. **integrifolia** (*Hyparrhenion sinaicae*)
- Andryala laxiflora** (Salzm.) DC. (*Hyparrhenion sinaicae*)
- Andryala ragusina** L. (*Andryaletalia ragusinae*)
- Andryala varia** Lowe ex DC. (*Greenovio-Aeonietea*)
- Anemone albida* (see *Anemone trifolia* subsp. *albida*)
- Anemone nemorosa** L. (*Querceto-Fagetea*)
- Anemone palmata** L. (*Quercetalia ilicis*)
- Anemone trifolia** L. subsp. **albida** (Mariz) Ulbr. (*Quercenion robori-pyrenaicae*)
- Angelica laevis* J.G. Gay (see *Angelica major*)
- Angelica lignescens** Reduron & Danton in Danton, Reduron & Baffray (*Pericallion malvifoliae*)
- Angelica major** Lag. (*Filipendulion ulmariae*)
- Angelica pachycarpa** Lange (*Crithmo-Armerion maritimae*)
- Angelica sylvestris** L. (*Filipendulion ulmariae*)
- Anogramma leptophylla** (L.) Link (*Selaginello denticulatae-Anogrammion leptophyllae*)
- Anomodon viticulosus** (Hedw.) Hook & J. Tayl. (*Anomodonto-Polypodietalia*)
- Anredera cordifolia** (Ten.) Steenis (*Ageratinio adenophorae-Ipomaeion acuminatae*)
- Anthemis alpestris** (Hoffmanns. & Link) R. Fernandes (*Hieracio castellani-Plantaginion radicatae*)
- Anthemis arvensis** L. (*Scleranthion annui*)
- Anthemis cotula** L. (*Stellarietalia mediae*)
- Anthemis maritima** L. (*Euphorbio paraliae-Ammophiletalia arundinaceae*)
- Anthoxanthum amarum** Brot. (*Calystegietalia sepium*)
- Anthoxanthum aristatum** Boiss. subsp. **aristatum** (*Tuberarietalia guttatae*)
- Anthoxanthum maderensis** Lowe (*Deschampsio maderensis-Parafestucion albidae*)
- Anthoxanthum odoratum** L. (*Molinio-Arrhenatheretea*)
- Anthoxanthum ovatum** Lag. (*Malcolmietalia*)
- Anthriscus caucalis** M. Bieb. (*Cardamino hirsutae-Geranietea purpurei*)
- Anthriscus sylvestris** (L.) Hoffm. (*Galio aparines-Alliarietalia petiolatae*)
- Anthyllis hamosus* (see *Hymenocarpos hamosus*)
- Anthyllis iberica* (see *Anthyllis vulneraria* subsp. *iberica*)
- Anthyllis lemanningiana** Lowe (*Deschampsio maderensis-Parafestucion albidae*)
- Anthyllis lotoides* (see *Hymenocarpos lotoides*)
- Anthyllis lusitanica* (see *Anthyllis vulneraria* subsp. *lusitanica*)
- Anthyllis maura* (see *Anthyllis vulneraria* subsp. *maura*)
- Anthyllis sampaioana* (see *Anthyllis vulneraria* subsp. *sampaioana*)
- Anthyllis vulneraria** L. subsp. **iberica** (W. Becker) J alas & Cullen (*Crithmo-Armerion maritimae*)
- Anthyllis vulneraria** L. subsp. **lusitanica** (Culen & P. Silva) Franco (*Tuberarietalia guttatae*)
- Anthyllis vulneraria** L. subsp. **maura** (G. Beck) Lindb. (*Rosmarinetaea officinalis*)
- Anthyllis vulneraria** L. subsp. **sampaioana** (Rothm.) Vasc. (*Potentillo montanae-Brachypodion rupestris*)
- Antinoria agrostidea** (L.) Parl. var. **agrostidea** (*Glycerio-Sparganion*)
- Antinoria agrostidea** (L.) Parl. var. **annua** Lange (*Isoetetalia*)
- Antinoria agrostidea** (L.) Parl. var. **natans** Hack (*Littorellion uniflorae*)
- Antinoria annua* (see *Antinoria agrostidea* var. *annua*)
- Antinoria natans* (see *Antinoria agrostidea* var. *natans*)
- Antirrhinum ambiguum* (see *Antirrhinum meonanthum* subsp. *ambiguum*)
- Antirrhinum braun-blauquetii** Rothm. (*Asplenietea trichomanes*)
- Antirrhinum cirrhigerum* (see *Antirrhinum linkianum* subsp. *cirrhigerum*)
- Antirrhinum graniticum** Rothm. (*Rumici indurati-Dianthion lusitani*)
- Antirrhinum linkianum** Boiss. & Reuter (*Calendulo lusitanicae-Antirrhinon linkiani*)
- Antirrhinum linkianum** Boiss. & Reuter **cirrhigerum** (Ficalho) Rivas-Martínez, T.E. Díaz & Fern. Gonz. (*Rubio longifoliae-Coremation albi*)
- Antirrhinum majus** L. subsp. **majus** (*Parietarietalia*)
- Antirrhinum meonanthum** Hoffmann. & Link subsp. **ambiguum** (Lange) Rivas Mart. (*Saxifragion fragosoi*)
- Antirrhinum meonanthum** Hoffmanns & Link subsp. **meonanthum** (*Parietario-Galion muralis*)
- Aphanes arvensis** L. (*Scleranthion annui*)
- Aphanes australis** Rydb. in Britton & Underw. (*Tuberarietalia guttatae*)
- Aphanes cornucopioides** Lag. (*Tuberarietalia guttatae*)
- Aphyllanthes monspeliensis** L. (*Rosmarinetaea officinalis*)
- Apium graveolens** L. (*Juncetea maritimi*)
- Apium inundatum** (L.) Rchb. (*Eleocharition multicaulis*)
- Apium leptophyllum** (Pers.) F. Muell. ex Benth. (*Apio leptophyllae-Oxalidetum pes-caprae*)
- Apium nodiflorum** (L.) Lag. (*Rorippion nasturtii-aquaticum*)
- Apium repens** (Jacq.) Lag. (*Rorippion nasturtii-aquaticum*)
- Apollonia barbujana** (Cav.) Bornm. (*Visneo mocanerae-Apollonion barbujanae*)
- Aquilegia dichroa* (see *Aquilegia vulgaris* subsp. *dichroa*)
- Aquilegia hispanica* (see *Aquilegia vulgaris* subsp. *dichroa*)
- Aquilegia vulgaris** L. subsp. **dichroa** Freyn (*Trifolio medii-Geranietea sanguinei*)
- Aquilegia vulgaris** L. subsp. **hispanica** (Willk.) Heywood (*Trifolio medii-Geranietea sanguinei*)
- Aquilegia vulgaris** L. subsp. **vulgaris** (*Querceto-Fagetea*)
- Arabidopsis thaliana** (L.) Heynh. (*Stellarietalia mediae*)
- Arabis caucasica** Schldl. (*Greenovio-Aeonietea*)
- Arabis glabra** (L.) Bernh. (*Galio-Alliarietalia petiolatae*)
- Arabis jurensis** Rothm. (*Linarion triornithophorae*)
- Arabis lusitanica** Boiss. (*Stachyo lusitanicae-Cheirolophenion sempervirentis*)
- Arabis sadina** (Samp.) Cout. (*Calendulo lusitanicae-Antirrhinon linkiani*)
- Arabis stenocarpa** Boiss. & Reut. (*Origanion virentis*)
- Arachniodes webbiana** Schldl. (*Sibthorpio peregrinae-Clethron arboreae*)
- Arbutus unedo** L. (*Ericion arboreae*)
- Arceuthobium azoricum** Hawksworth & Wiens (*Lauro azoricae-Juniperetea brevifoliae*)
- Arctium minus** Bernh. (*Arction lappae*)
- Arctotheca calendula** (L.) Levyns (*Sisymbrietalia officinalis*)
- Arenaria algarbiensis** Welw. ex Willk. (*Hymenocarpo hamosi-Malcolmion trilobae*)
- Arenaria conimbricensis** Brot. (*Tuberarietalia guttatae*)
- Arenaria emarginata** Brot. (*Hymenocarpo hamosi-Malcolmion trilobae*)
- Arenaria fontiqueri* (see *Arenaria querioides* subsp. *fontiqueri*)
- Arenaria leptoclados** (Rchb.) Guss. (*Tuberarietalia guttatae*)
- Arenaria montana** L. (*Quercetalia roboris*)
- Arenaria querioides** Pourr. ex Willk. subsp. **querioides** (*Hieracio castellani-Plantaginion radicatae*)
- Arenaria querioides** Pourr. ex Willk. subsp. **fontiqueri** (P. Silva) Rocha Afonso (*Armerion eriophyllae*)
- Arenaria serpyllifolia** L. (*Tuberarietalia guttatae*)
- Argyranthemum montanum* (see *Argyranthemum pinnatifidum* subsp. *montanum*)
- Argyranthemum pinnatifidum** (L.f.) Lowe subsp. **montanum** Rustan (*Bystropogono punctati-Telinion maderensis*)
- Argyranthemum pinnatifidum** (L.f.) Lowe subsp. **pinnatifidum** (*Bystropogono punctati-Telinion maderensis*)

- Argyranthemum pinnatifidum** (L.f.) Lowe subsp. **succulentum** (Lowe) Humphr. (*Argyranthemum succulenti-Calendulion maderensis*)
Argyranthemum succulentum (see *Argyranthemum pinnatifidum* subsp. *succulentum*)
- Argyranthemum thalassophilum** (Svent.) Humphries (*Kleinio-Euphorbietea canariensis*)
- Argyrolobium zanonii** (Turra). B.W.Ball (*Rosmarinetea officinalis*)
- Arisarum simorrhinum** Durieu. (*Quercu rotundifoliae-Oleion sylvestris*)
- Aristida adscensionis** L. (*Hyparrhenion sinaicae*)
- Aristolochia baetica** L. (*Asparago albi-Rhamnion oleoidis*)
- Aristolochia paucinervis** Pomel (*Populetalia albae*)
- Aristolochia pistolochia** L. (*Rosmarinetalia officinalis*)
- Armeria beirana** Franco (*Festucion merinoi*)
- Armeria berlengensis** Daveau (*Crithmo-Armerion maritimae*)
- Armeria cinerea* (see *Armeria welwitschii* subsp. *cinerea*)
- Armeria daveaui* (see *Armeria langei* subsp. *daveaui*)
- Armeria duriaei** Boiss. (*Teesdaliopsio-Luzulion caespitosae*)
- Armeria eriophylla** Willk. (*Armerion eriophyllae*)
- Armeria gaditana** Boiss. (*Agrostion castellanae*)
- Armeria humilis** (Link) Schult. in Roem & Schult. subsp. **humilis** (*Hieracio castellani-Plantaginon radicatae*)
- Armeria humilis** (Link) Schult. in Roem & Schult. subsp. **odorata** (Samp.) P. Silva (*Sedion anglici*)
- Armeria langei** Boiss. subsp. **daveaui** (Cout.) P. Silva (*Armerion eriophyllae*)
- Armeria langei** Boiss. subsp. **marizii** (Daveau) Aguiar, Sanchez-Mata & Monteiro-Henriques (*Armerion eriophyllae*)
- Armeria linkiana** Nieto Fel. (*Brachypodion phoenicoidis*)
- Armeria macrophylla** Boiss. & Reut. (*Coremation albi*)
- Armeria maderensis** Lowe (*Deschampsio maderensis-Parafestucion albidae*)
- Armeria major* (see *Armeria pungens* subsp. *major*)
- Armeria maritima** Willd. subsp. **maritima** (*Glaucopuccinellietalia*)
- Armeria maritima** Willd. subsp. **miscella** (Merino) Malag. (*Crithmo-Armerion maritimae*)
- Armeria marizii* (see *Armeria langei* subsp. *marizii*)
- Armeria miscella* (see *Armeria maritima* subsp. *miscella*)
- Armeria odorata* (see *Armeria humilis* subsp. *odorata*)
- Armeria pinifolia** (Brot.) Hoffmanns. & Link (*Coremation albi*)
- Armeria pseudarmeria** (Murray) Mansfeld (*Crithmo-Daucion halophili*)
- Armeria pubigera** (Desf.) Boiss. in DC. (*Crithmo-Armerion maritimae*)
- Armeria pungens** (Link) Hoffmanns. subsp. **major** (Daveau) Franco (*Crithmo-Daucion halophili*)
- Armeria pungens** (Link) Hoffmanns. subsp. **pungens** (*Helichryson picardii*)
- Armeria rouyana** Daveau (*Coremation albi*)
- Armeria sampaioi** (Bernis) Nieto Fel. (*Teesdaliopsio-Luzulion caespitosae*)
- Armeria segoviensis** (Gand. ex Bernis) Rivas-Mart. (*Agrostietalia castellanae*)
- Armeria transmontana** (Samp.) Lawr. (*Hieracio-Plantaginon radicatae*)
- Armeria velutina** Welw. ex Boiss. & Reut. (*Coremation albi*)
- Armeria welwitschii** Boiss. subsp. **cinerea** (Boiss. & Welw.) Capelo & J.C. Costa (*Crithmo-Daucion halophili*)
- Armeria welwitschii** Boiss. subsp. **welwitschii** (*Helichryson picardii*)
- Armeria x francoi** J.C. Costa & Capelo (*Agrostion castellanae-Celticion giganteae*)
- Arnica atlantica* (see *Arnica montana* subsp. *atlantica*)
- Arnica montana** L. subsp. **atlantica** A. Bolòs (*Anagallido-Juncion bulbosi*)
- Arnoseric minima** (L.) Scwegg. & Koerte (*Scleranthion annui*)
- Arrhenatherum album** (Vahl) W.D. Clayton var. **album** (*Lygeo-Stipetea*)
- Arrhenatherum album** (Vahl) W.D. Clayton var. **erianthum** (Boiss. & Reuter) Romero Zarco (*Agrostio castellanae-Celticion giganteae*)
- Arrhenatherum baeticum** (Romero Zarco) Rivas Mart. Fern. Gonz. & Loidi (*Agrostio castellanae-Celticion giganteae*)
- Arrhenatherum bulbosum* (see *Arrhenatherum elatius* subsp. *bulbosum*)
- Arrhenatherum carpetanum** (*Linario saxatilis-Senecionion carpetani*)
- Arrhenatherum elatius** (L.) P. Beauv. ex J. Presl & C. Presl. subsp. **elatius** (*Arrhenatherion elatioris*)
- Arrhenatherum elatius** (L.) P. Beauv. ex J. Presl & C. Presl. subsp. **bulbosum** (Willd.) Schübler & Martens (*Molinio-Arrhenatheretea*)
- Arrhenatherum erianthum* (see *Arrhenatherum album* var. *erianthum*)
- Artemisia absinthium** L. (*Artemisietea vulgaris*)
- Artemisia arborescens** L. (*Salsolo vermiculatae-Peganetalia harmalae*)
- Artemisia argentea** L'Hér. (*Soncho ustulati-Artemision argenteae*)
- Artemisia campestris** L. subsp. **glutinosa** (J. Gay ex Besser) Batt. in Batt. & Trab. (*Pegano-Salsolitea*)
- Artemisia crithmifolia** L. (*Helichryson picardii*)
- Artemisia gallica** Willd subsp. **gallica** (*Sarcocornietea fruticosa*)
- Artemisia glutinosa* (see *Artemisia campestris* subsp. *glutinosa*)
- Artemisia verlotiorum** Lamotte (*Artemisietalia vulgaris*)
- Artemisia vulgaris** L. (*Artemisietea vulgaris*)
- Arthrocnemum alpini* (see *Sarcocornia perennis* subsp. *alpini*)
- Arthrocnemum perennis* (see *Sarcocornia perennis* subsp. *perennis*)
- Arthrocnemum fruticosum* (see *Sarcocornia fruticosa*)
- Arthrocnemum macrostachyum** (Moric.) Morris (*Arthrocnemion macrostachyi*)
- Arum canariensis* (see *Arum italicum* subsp. *canariensis*)
- Arum cylindraceum** Gasparr. (*Populion albae*)
- Arum italicum** Mill. subsp. **canariensis** (Webb & Berthel.) P.C. Boyce (*Visneo mocanerae-Apollonion barbujanae*)
- Arum italicum** Mill. subsp. **italicum** (*Populion albae*)
- Arum italicum** Mill. subsp. **neglectum** (Townsend) Prime (*Quercu rotundifoliae-Oleion sylvestris*)
- Arum maculatum** L. (*Quercu-Fagetea*)
- Arum neglectum* (see *Arum italicum* subsp. *neglectum*)
- Asparagus acutifolius** L. (*Quercetea ilicis*)
- Asparagus albus** L. (*Pistacio lentisci-Rhamnietalia alaterni*)
- Asparagus aphyllus** L. (*Quercu rotundifoliae-Oleion sylvestris*)
- Asparagus asparagoides** (L.) Druce (*Ageratinio adenophorae-Ipomaeion acuminatae*)
- Asparagus lowei* (see *Asparagus umbellatus* subsp. *lowei*)
- Asparagus nesiotis** Svent subsp. **nesiotis** (*Kleinio-Euphorbietea canariensis*)
- Asparagus scoparius** Lowe (*Rhamno crenulatae-Oleetalia cerasiformis*)
- Asparagus umbellatus** Link subsp. **lowei** (Kunth) Valdés (*Mayteno umbellatae-Oleion maderensis*)
- Asperula arvensis** L. (*Centaureetalia cyani*)
- Asperula hirsuta** Desf. (*Saturejo-Thymbrion capitatae*)
- Asphodelus aestivus** Brot. (*Agrostion castellanae*)
- Asphodelus arrondeaui** Lloyd (*Epilobietea angustifoliae*)
- Asphodelus bento-rainhae** P. Silva subsp. **bento-rainhae** (*Agrostion castellanae*)
- Asphodelus distalis* (see *Asphodelus ramosus* subsp. *distalis*)
- Asphodelus fistulosus** L. (*Hordeion leporini*)
- Asphodelus lusitanicus** Cout. var. **lusitanicus** (*Balloto-Coion maculati*)
- Asphodelus lusitanicus** Cout. var. **ovoideus** (Mariz) Z. Díaz & Valdés (*Carici piluliferae-Epilobion angustifolii*)

- Asphodelus ovoideus* (see *Asphodelus lusitanicus* var. *ovoi-deus*)
- Asphodelus ramosus** L. subsp. **distalis** Z. Díaz & Valdés (*Brachypodium phoenicoidis*)
- Asplenium adiantum-nigrum** L. var. **adiantum-nigrum** (*Androsacetalia vandellii*)
- Asplenium adiantum-nigrum** L. var. **corunnense** H. Christ (*Cymbalario-Asplenion*)
- Asplenium aethiopicum** (Burm.f.) Bech (*Cheilanthon pulchellae*)
- Asplenium anceps** Lowe ex Hook & Grev. (*Hymenophyllum tunbrigensis*)
- Asplenium azoricum** (Mild) Lovis, Rasbach & Reichst. (*Cymbalario-Asplenion*)
- Asplenium billotii** F.W. Schultz (*Androsacetalia vandellii*)
- Asplenium ceterach** L. (*Cymbalario-Asplenion*)
- Asplenium corunnense* (see *Asplenium adiantum-nigrum* var. *corunnense*)
- Asplenium hemionitis** L. (*Bartramio strictae-Polypodium cambrici*)
- Asplenium maderense* (see *Asplenium trichomanes* subsp. *maderense*)
- Asplenium marinum** L. (*Asplenion marini*)
- Asplenium monanthes** L. (*Cheilanthon pulchellae*)
- Asplenium obovatum** Viv. (*Phagnalo saxatilis-Cheilanthon maderensis*)
- Asplenium onopteris** L. (*Quercetalia ilicis*)
- Asplenium petrarchae** (Guérin) DC. (*Asplenetalia petrarchae*)
- Asplenium quadrivalens* (see *Asplenium trichomanes* subsp. *quadrivalens*)
- Asplenium ruta-muraria** L. (*Asplenetalia trichomanes*)
- Asplenium septentrionale** (L.) Hoffm. (*Androsacetalia vandellii*)
- Asplenium trichomanes** L. subsp. **maderense** Gibby & Lovis (*Cheilanthon pulchellae*)
- Asplenium trichomanes** L. subsp. **quadrivalens** D.E. Mey. (*Cymbalario-Asplenion*)
- Asplenium trichomanes** L. subsp. **trichomanes** (*Androsacetalia vandellii*)
- Aster aragonensis** Asso (*Cistion laurifolii*)
- Aster pannonicus* (see *Aster tripolium* subsp. *pannonicus*)
- Aster sedifolius** L. (*Brachypodietalia phoenicoidis*)
- Aster squamatus** (Spreng.) Hiern. (*Elytrigietalia repentis*)
- Aster tripolium** L. subsp. **pannonicus** (Jacq.) Soó (*Juncetea maritimi*)
- Asterella africana** (Mont.) A. Evans (*Deschampsion argenteae*)
- Asteriscus maritimus** (L.) Less. (*Crithmo-Limonietea*)
- Asterolinon linum-stellatum** (L.) Duby (*Tuberietea guttatae*)
- Astragalus cymbaearpos** Brot. (*Periballio-Trifolium subterranei*)
- Astragalus echinatus** Murray (*Astragalo sesamei-Poion bulbosae*)
- Astragalus epiglottis** L. (*Astragalo sesamei-Poion bulbosae*)
- Astragalus glaucus** L. (*Rosmarinetalia officinalis*)
- Astragalus glycyphyllos** L. (*Trifolio medii-Geranietae sanguinei*)
- Astragalus hamosus** L. (*Thero-Brometalia*)
- Astragalus incanus* subsp. *macrorhizus* (see *Astragalus incanus* subsp. *nummularioides*)
- Astragalus incanus** L. subsp. **nummularioides** (Desf.) Maire (*Armerion eriophyllae*)
- Astragalus lusitanicus** Lam. (*Ulici argentei-Cistion ladaniferi*)
- Astragalus macrorhizus* Cav. (see *Astragalus incanus* subsp. *nummularioides*)
- Astragalus massiliensis* (see *Astragalus tragacantha* subsp. *vicentinus*)
- Astragalus nummularioides* (see *Astragalus incanus* subsp. *nummularioides*)
- Astragalus sesameus** L. (*Astragalo sesamei-Poion bulbosae*)
- Astragalus stella** Gouan (*Astragalo sesamei-Poion bulbosae*)
- Astragalus tragacantha** L. subsp. **vicentinus** (Samp.) Rivas Mart., T.E. Díaz & Fern. Gonz. (*Astragalion tragacanthae*)
- Astragalus vicentinus* (see *Astragalus tragacantha* subsp. *vicentinus*)
- Astydamia latifolia** (L.f.) Baill. (*Frankenio-Astydamion latifoliae*)
- Athyrium filix-femina** (L.) Roth (*Quercu-Fagetea*)
- Atractylis cancellata** L. (*Brachypodietalia distachyi*)
- Atractylis gummifera** L. (*Carthametalia lanati*)
- Atriplex glauca** L. subsp. **ifniensis** (Caball.) Rivas Mart., Wildpret, Del Arco, O. Rodríguez, P. Pérez, García Gallo, T.E. Díaz & Fern. Gonz. (*Forsskaoleo angustifoliae-Rumicetalia lunariae*)
- Atriplex halimus** L. (*Salsolo vermiculatae-Peganetalia harmalae*)
- Atriplex ifniensis* (see *Atriplex glauca* subsp. *ifniensis*)
- Atriplex patula** L. (*Stellarietea mediae*)
- Atriplex prostrata** Boucher ex DC. (*Chenopodietalia muralis*)
- Atriplex rosea** L. (*Chenopodietalia muralis*)
- Aulacomnium palustris** (Hedw.) Schwägr. (*Erico tetralicis-Sphagnetalia papilloso*)
- Avellinia michelii** (Savi) Parl. (*Malcolmietalia*)
- Avena barbata** Pott ex Link subsp. **barbata** (*Thero-Brometalia*)
- Avena barbata** Pott ex Link subsp. **lusitanica** (Tab. Morais) Romero Zarco (*Thero-Brometalia*)
- Avena fatua** L. (*Centaureetalia cyani*)
- Avena longiglumis** Durieu (*Linario polygalifoliae-Vulpion alopecuoris*)
- Avena ludoviciana* (see *Avena sterilis* subsp. *ludoviciana*)
- Avena lusitanica* (see *Avena barbata* subsp. *lusitanica*)
- Avena sterilis** L. subsp. **ludoviciana** (Durieu) Nyman (*Roemeriion hybridae*)
- Avena sterilis** L. subsp. **sterilis** (*Thero-Brometalia*)
- Avena strigosa** Schreber (*Scleranthion annui*)
- Avenella flexuosa** (L.) Parl. subsp. **flexuosa** (*Quercetalia roboris*)
- Avenella flexuosa** (L.) Parl. subsp. **iberica** (Rivas Mart.) García-Suárez, Fern.-Carv. & Fern. Prieto (*Junipero sabinae-Pinetea sylvestris*)
- Avenella foliosa** (Hack.) Rivas Mart., Lousã, Fern. Prieto, E. Dias, J.C. Costa & C. Aguiar (*Festucion francoi*)
- Avenella iberica* (see *Avenella flexuosa* subsp. *iberica*)
- Avenella stricta** (Hackel) P. Silva (*Quercenion rivasmartinezii-suberis*)
- Avenula albinervis* (see *Avenula lodunensis* subsp. *albinervis*)
- Avenula bromoides** (Gouan) H. Scholtz subsp. **bromoides** (*Lygeo-Stipetalia*)
- Avenula cintrana* (see *Avenula lodunensis* subsp. *cintrana*)
- Avenula gaditana* (see *Avenula lodunensis* subsp. *gaditana*)
- Avenula gervaisii** Holub subsp. **gervaisii** (*Stipion tenacissimae*)
- Avenula hackelii* (see *Helictotrichon hackelii* subsp. *hackelii*)
- Avenula lodunensis** (Delastre) Kerguélen subsp. **albinervis** (Boiss.) Rivas Mart. (*Stauracanthion boivinii*)
- Avenula lodunensis** (Delastre) Kerguélen subsp. **cintrana** (Röser) Cebolla, López Rodr. & Rivas Ponce (*Agrostion castellanae*)
- Avenula lodunensis** (Delastre) Kerguélen subsp. **gaditana** (Romero Zarco) Rivas Mart. (*Agrostion castellanae*)
- Avenula lodunensis** (Delastre) Kerguélen subsp. **occidentalis** (Gervais) Romero Zarco (*Calendulo lusitanicae-Antirrhinion linkiani*)
- Avenula lodunensis** (Delastre) Kerguélen subsp. **lodunensis** (*Calluno-Ulicetea*)

- Avenula lusitanica** (Romero Zarco) J. Holub (*Potentillo montanae-Brachypodienion rupestris*)
Avenula occidentalis (see *Avenula lodunensis* subsp. *occidentalis*)
Avenula pubescens (Hudson) Dumort. (*Arrhenatheretalia elatioris*)
Avenula stenophylla (see *Helictotrichon hackelii* subsp. *stenophylla*)
Avenula sulcata subsp. *sulcata* (see *Avenula lodunensis* subsp. *lodunensis*)
Azolla filiculoides Lam. (*Lemnetalia minoris*)
Azorina vidali (H.C. Watson) Feer (*Euphorbio azoricae-Festucion petraeae*)
Baldellia alpestris (Cosson) Vasc. (*Eleocharition multicaulis*)
Baldellia ranunculoides (L.) Parl. (*Eleocharition multicaulis*)
Ballota foetida (see *Ballota nigra* subsp. *foetida*)
Ballota hirsuta Benth. (*Pegano-Salsoletea*)
Ballota nigra L. subsp. *foetida* Hayek (*Balloto-Conion maculati*)
Barlia robertiana (Loisel) Greut. (*Pistacio lentisci-Rhamnetalia alaterni*)
Bartramia stricta Brid. (*Bartramio strictae-Polypodium cambrici*)
Bartsia aspera (Brot.) Lange (*Ulici densi-Thymion sylvestris*)
Bellardia trixago (L.) All. (*Thero-Brometalia*)
Bellevalia hackelii Freyn (*Stipion tenacissimae*)
Bellis annua L. subsp. *annua* (*Poetea bulbosae*)
Bellis azorica Hochst. (*Lauro azoricae-Juniperetea brevifoliae*)
Bellis pappulosa (see *Bellis sylvestris* var. *pappulosa*)
Bellis perennis L. (*Cynosurion cristati*)
Bellis sylvestris Cyr. var. *pappulosa* (Boiss. ex DC.) Lange (*Poetea bulbosae*)
Bellis sylvestris Cyr. var. *sylvestris* (*Poetea bulbosae*)
Berberis maderensis Lowe (*Sibthorpio peregrinae-Clethrion arboreae*)
Berula erecta (Huds.) Coville (*Rorippion nasturtii-aquatici*)
Beta maritima L. var. *maritima* (*Cakiletea maritimae*)
Betula celtiberica Rothmal. & Vasc. (*Betulion fontqueri-celtibericae*)
Biarum arundanum Boiss. & Reut. (*Quercetea ilicis*)
Biarum dispar (Schott) Talavera (*Teucrio pseudochamaepityos-Brachypodium retusi*)
Bidens aurea (Aiton) Sherff (*Bidention tripartitae*)
Bidens frondosa L. (*Bidention tripartitae*)
Bidens pilosa L. (*Chenopodio-Stellarienea*)
Bidens tripartita L. (*Bidentetalia tripartitae*)
Bifora testiculata (L.) Roem. & Schult. (*Roemerion hybridae*)
Biscutella auriculata L. (*Roemerion hybridae*)
Biscutella lusitanica Jord. (*Calendulo lusitanicae-Antirrhinion linkiani*)
Biscutella valentina (L.) Heywood subsp. *valentina* (*Thlaspietea rotundifolii*)
Biscutella vincentina (Samp.) Guinea (*Eryngio-Ulicenion erinacei*)
Biserrula pelecinus L. (*Periballio-Trifolion subterranei*)
Bituminaria bituminosa (L.) C.H. Stirt. (*Lygeo-Stipetea*)
Blackstonia acuminata (Koch & Ziz) Domin subsp. *aestiva* (K. Malý) Zeltner (*Brachypodium distachyi*)
Blackstonia imperfoliata (L. f.) Samp. (*Verbenion supinae*)
Blackstonia perfoliata (L.) Huds. (*Holoschoenetalia vulgaris*)
Blechnum spicant L. (*Quercetalia roboris*)
Bolboschoenus compactus (see *Bolboschoenus maritimus* var. *compactus*)
Bolboschoenus maritimus (L.) Palla var. *compactus* (Hoffm.) Hejny (*Bolboschoenetalia compacti*)
Bolboschoenus maritimus (L.) Palla var. *maritimus* (*Bolboschoenion maritimi*)
Borago officinalis L. (*Chenopodio-Stellarienea*)
Brachypodium distachyon (L.) Beauv. (*Brachypodietalia distachyi*)
Brachypodium gaditanum Talavera (*Tolpido azoricae-Holcetea rigidi*)
Brachypodium phoenicoides (L.) Roem. & Schult. (*Brachypodietalia phoenicoidis*)
Brachypodium retusum (Pers.) P. Beauv. (*Lygeo-Stipetea*)
Brachypodium rupestre (Host) Roem. & Schult. (*Potentillo montanae-Brachypodium rupestris*)
Brachypodium sylvaticum (Huds.) P. Beauv. (*Salici purpureae-Populetea nigrae*)
Brachythecium rivulare Shimp. (*Montio-Cardaminetalia*)
Brassica barrelieri (L.) Junka (*Alyso granatensis-Brassicion barrelieri*)
Brassica oxyrrhina Cosson (*Linario polygalifoliae-Vulpion alopecuoris*)
Briza maxima L. (*Tuberarietea guttatae*)
Briza minor L. (*Tuberarietalia guttatae*)
Bromus diandrus Roth (*Thero-Brometalia*)
Bromus erectus Huds. (*Festuco-Brometea*)
Bromus hordeaceus L. (*Stellarietea mediae*)
Bromus lanceolatus Roth (*Thero-Brometalia*)
Bromus madritensis L. (*Thero-Brometalia*)
Bromus racemosus L. (*Calthion palustris*)
Bromus ramosus Huds. (*Atropetalia belladonae*)
Bromus rigidus Roth (*Thero-Brometalia*)
Bromus rubens L. (*Thero-Brometalia*)
Bromus scoparius L. (*Hordeion leporini*)
Bromus secalinus L. (*Scleranthion annui*)
Bromus squarrosus L. (*Thero-Brometalia*)
Bromus sterilis L. (*Stellarietea mediae*)
Bromus tectorum L. (*Stellarietea mediae*)
Bryonia dioica Jacq. (*Populion albae*)
Bryum argenteum Hedw. (*Polygono arenastri-Poetalia annuae*)
Bryum schleicheri Schwägr. (*Cardamino amarae-Montion fontanae*)
Bufonia macropetala Willk. (*Hieracio castellani-Plantaginion radicatae*)
Bufonia willkommiana Boiss. (*Cheilanthon hispanicae*)
Buglossoides arvensis (L.) I.M. Johnst. subsp. *arvensis* (*Centaureetalia cyani*)
Bunium brevifolium Lowe (*Bystropogono punctati-Telinion maderensis*)
Bupleurum fruticosum L. (*Pistacio lentisci-Rhamnetalia alaterni*)
Bupleurum gerardi All. (*Brachypodietalia distachyi*)
Bupleurum lancifolium Hornem. (*Ridolfion segeti*)
Bupleurum paniculatum Brot. (*Quercetalia ilicis*)
Bupleurum salicifolium R. Br. in Buch subsp. *salicifolium* (*Rhamno crenulatae-Oleetalia cerasiformis*)
Bupleurum semicompositum L. (*Brachypodietalia distachyi*)
Bupleurum tenuissimum L. (*Saginetea maritimae*)
Butomus umbellatus L. (*Magno-Carici elatae-Phragmitetea australis*)
Bystropogon punctatus L'Hér. (*Bystropogono punctati-Telinion maderensis*)
Cachrys sicula L. (*Brachypodietalia phoenicoidis*)
Cakile edentula (Bigew.) Hook (*Cakiletea maritimae*)
Cakile integrifolia (see *Cakile maritima* subsp. *integrifolia*)
Cakile maritima Scop. subsp. *integrifolia* (Hoernem.) Hyl ex Greuter & Burdet (*Atriplicion littoralis*)
Cakile maritima Scop. subsp. *maritima* (*Cakilion maritimae*)
Calamagrostis arundinacea (L.) Roth
Calamintha baetica (see *Calamintha nepeta* Savi subsp. *nepeta*)
Calamintha nepeta (L.) Savi subsp. *nepeta* (*Trifolio medii-Geranietea sanguinei*)
Calendula algarbiensis Boiss. (*Brassicion oleraceae*)
Calendula arvensis L. (*Stellarietea mediae*)
Calendula incana Willd. (*Brassicion oleraceae*)
Calendula lusitanica (see *Calendula suffruticosa* subsp. *lusitanica*)

- Calendula maderensis** DC. (*Argyranthemum succulentum-Calendula maderensis*)
Calendula suffruticosa subsp. *tomentosa* (see *Calendula incana*)
Calendula suffruticosa Vahl. subsp. **lusitanica** (Boiss.) Ohle (*Calendula lusitanicae-Antirrhinum linkianum*)
Calicotome villosa (Poir.) Link (*Asparago albi-Rhamnion oleoidis*)
Callitriche brutia Petagna (*Potametea*)
Callitriche cribrata Schots. (*Ranunculus aquatilis*)
Callitriche hamulata Kütz. (*Ranunculus fluitantis*)
Callitriche lusitanica Schots. (*Potametea*)
Callitriche obtusangula Le Gall (*Ranunculus fluitantis*)
Callitriche regis-jubae Schotsman (*Ranunculus aquatilis*)
Callitriche stagnalis Scop. (*Ranunculus aquatilis*)
Calluna vulgaris (L.) Hull. (*Calluno-Ulicetea*)
Caltha palustris L. subsp. **minor** (Miller) Graeben. (*Cardamino amarae-Montion fontanae*)
Caltha palustris L. subsp. **palustris** (*Calthion palustris*)
Calystegia sepium (L.) R.Br. (*Senecionium fluviatilis*)
Calystegia soldanella (L.) R. Br. (*Ammophiletalia*)
Calystegia sylvatica (Kit.) Griseb. (*Senecionium fluviatilis*)
Camelina microcarpa Andr. ex DC. (*Stellarietea mediae*)
Campanula erinus L. (*Brachypodium distachyoides*)
Campanula herminii Hoffmanns. & Link (*Campanulo herminii-Nardetalia strictae*)
Campanula lusitanica L. in Loef. subsp. **lusitanica** (*Tuberarietalia guttatae*)
Campanula primulifolia Brot. (*Osmundo-Alnion*)
Campanula rapunculus L. (*Trifolio medii-Geranietea sanguinei*)
Capnophyllum peregrinum (L.) Lange in Wilk. & Lange (*Ridolfion segeti*)
Capsella bursa-pastoris (L.) Medik. (*Stellarietea mediae*)
Capsella rubella Reut. (*Stellarietea mediae*)
Cardamine caldeirarum Seub. (*Cardaminetum caldeirarum*)
Cardamine flexuosa With. (*Caricion remotae*)
Cardamine hirsuta L. (*Cardaminetea hirsutae*)
Cardamine parviflora L. (*Isoeto-Nano-Juncetea*)
Cardamine pratensis L. (*Molinio-Arrhenatheretea*)
Cardaria draba (L.) Desv. (*Stellarietea mediae*)
Cardiospermum grandiflorum Sw. (*Ageratinio adenophorae-Ipomaeion acuminatae*)
Carduncellus caeruleus (L.) C. Presl (*Carthametalia lanati*)
Carduus bourgeanus Boiss. & Reut. (*Carthametalia lanati*)
Carduus broteroi Cout. (*Onopordion castellani*)
Carduus carpetanus Boiss. & Reut. (*Carduo carpetani-Cirsion odontolepidis*)
Carduus gayanus Durieu ex Willk. (*Carduo carpetani-Cirsion odontolepidis*)
Carduus meonanthus Hoffmanns. & Link (*Linario polygalifoliae-Vulpion alopecuroidis*)
Carduus platypus Lange (*Carduo carpetani-Cirsion odontolepidis*)
Carduus pycnocephalus L. (*Onopordeneae acanthii*)
Carduus squarrosus (DC.) Lowe (*Visneo mocanerae-Apollonion barbujanae*)
Carduus tenuiflorus Curtis (*Onopordeneae acanthii*)
Carex acuta L. (*Magno-Caricion elatae*)
Carex arenaria L. (*Corynephorion maritimae*)
Carex asturica Boiss. (*Daboecion cantabricae*)
Carex azorica (see *Carex pilulifera* subsp. *azorica*)
Carex binervis Sm. (*Juncion acutiflori*)
Carex caryophyllea Latourr. (*Festuco-Brometea*)
Carex cedercreutzii (see *Carex viridula* subsp. *cedercreutzii*)
Carex chaetophylla (see *Carex divisa* var. *chaetophylla*)
Carex cuprina (I. Sándora ex Heuff.) Nendtv. ex A. Kern (*Potentillo anserinae*)
Carex demissa Hoernm (*Caricion fuscae*)
Carex depressa Link (*Quercetalia ilicis*)
Carex distachya Desf. (*Quercetalia ilicis*)
Carex distans L. (*Molinio-Arrhenatheretea*)
Carex divisa Huds. subsp. **divisa** (*Trifolio fragiferi-Cynodotion*)
Carex divisa Huds. var. **chaetophylla** (Steud.) Nyman (*Agrostietalia castellanae*)
Carex divulsa Stokes subsp. **divulsa** (*Origanetalia vulgaris*)
Carex divulsa Stokes subsp. **leersii** (Kneuck.) W. Koch (*Origanetalia vulgaris*)
Carex durieui Steudel ex Kunze (*Salici atrocineriae-Alnenion glutinosae*)
Carex echinata Murray (*Caricetalia nigrae*)
Carex elata All. subsp. **elata** (*Magno-Caricion elatae*)
Carex elata All. subsp. **reuteriana** (Boiss.) Luceño & Aedo (*Caricion reuterianae*)
Carex elata All. subsp. **tartesiaana** Luceño & Aedo (*Caricion reuterianae*)
Carex extensa Gooden (*Juncetea maritimi*)
Carex flacca Schreb. (*Molinio-Arrhenatheretea*)
Carex furva Webb (*Campanulo herminii-Nardetalia strictae*)
Carex guthnickiana J. Gay (*Tolpido azoricae-Holcetea rigidi*)
Carex halleriana Asso (*Quercetea ilicis*)
Carex hirta L. (*Plantaginetalia majoris*)
Carex hispida Willd. (*Magno-Caricion elatae*)
Carex hochstetteriana J. Gay ex Seub. (*Lauro azoricae-Junciperetea brevifoliae*)
Carex laevigata Sm. (*Alnetea glutinosae*)
Carex lamprocarpa (see *Carex muricata* subsp. *lamprocarpa*)
Carex leersii (see *Carex divulsa* subsp. *leersii*)
Carex lepidocarpa Tausch (*Scheuchzerio palustris-Caricetea nigrae*)
Carex leporina L. (*Nardetalia strictae*)
Carex lowei Bechever (*Sibthorpio peregrinae-Clethron arborescens*)
Carex lusitanica (see *Carex paniculata* subsp. *lusitanica*)
Carex muricata L. subsp. **lamprocarpa** Celak. (*Trifolio medii-Geranietea sanguinei*)
Carex nigra (L.) Reichard (*Scheuchzerio palustris-Caricetea nigrae*)
Carex oedipostyla Duval-Juve (*Quercetalia ilicis*)
Carex pallescens L. (*Nardetalia strictae*)
Carex panicea L. (*Molinietalia caeruleae*)
Carex paniculata L. subsp. **lusitanica** (Schkuhr ex Willd.) Maire (*Caricion reuterianae*)
Carex pendula Huds. (*Populetalia albae*)
Carex pilulifera L. subsp. **azorica** (Gay) Franco & Rocha Afonso (*Festucion francoi*)
Carex pilulifera L. subsp. **pilulifera** (*Nardetalia strictae*)
Carex pseudocyperus L. (*Magno-Carici elatae-Phragmitetea australis*)
Carex punctata Gaudin subsp. **punctata** (*Glaucio maritimae-Juncion maritimi*)
Carex punctata Gaudin var. **laevicaulis** (Hochst. ex Kunze) Boott (*Festucion francoi*)
Carex remota L. (*Populetalia albae*)
Carex reuteriana (see *Carex elata* subsp. *reuteriana*)
Carex riparia Curtis (*Magno-Caricion elatae*)
Carex sylvatica Huds. (*Fagetalia*)
Carex tartesiaana (see *Carex elata* subsp. *tartesiaana*)
Carex trinervis Degl. in Loisel. (*Anagallido-Juncion bulbosi*)
Carex viridula Michx. subsp. **cedercreutzii** (Fagerstr.) B. Schmid (*Anagallido-Juncion bulbosi*)
Carex viridula Michx. subsp. **viridula** (*Agrostion stoloniferae*)
Carex vulcani Hochst. in Seub. (*Tolpido azoricae-Holcetea rigidi*)
Carlina corymbosa L. subsp. **corymbosa** (*Carthametalia lanati*)
Carlina corymbosa L. subsp. **hispanica** (Lam.) O. Bolòs & Vigo (*Onopordeneae acanthii*)
Carlina corymbosa L. var. **major** Lange (*Crithmo-Daucion halophilii*)

- Carlina hispanica* (see *Carlina corymbosa* subsp. *hispanica*)
Carlina major (see *Carlina corymbosa* var. *major*)
Carlina racemosa L. (*Agrostion pourretii*)
Carlina salicifolia (L.f.) Cav. (*Micromerio hyssopifoliae-Cistetalia monspeliensis*)
Carthamus baeticus (see *Carthamus lanatus* subsp. *baeticus*)
Carthamus lanatus L. subsp. *baeticus* (Boiss. & Reut.) Nyman (*Onopordion castellani*)
Carthamus lanatus L. subsp. *lanatus* (*Carthametalia lanati*)
Carum verticillatum (L.) Koch (*Juncion acutiflori*)
Catananche caerulea L. (*Rosmarinetalia officinalis*)
Catananche lutea L. (*Cerintho majoris-Fedion cornucopiae*)
Catapodium marinum (L.) C.E. Hubb. (*Saginetea maritimae*)
Catapodium rigidum (L.) C.E. Hubb. subsp. *rigidum* (*Thero-Brometalia*)
Catapodium rigidum (L.) C.E. Hubb. subsp. *spicatum* (Trab.in Batt. & Trab.) Rivas Mart. (*Frankenion pulverulentae*)
Catapodium spicatum (see *Catapodium rigidum* subsp. *spicatum*)
Cedronella canariensis (L.) Webb & Berthel. (*Pruno hixae-Lauretea novocanariensis*)
Celtica gigantea (Link) Vazq. Pardo & Barkworth subsp. *gigantea* (*Agrostio castellanae-Celticion giganteae*)
Celtica gigantea (Link) Vazq. Pardo & Barkworth subsp. *sterilis* Vazq. Pardo & Barkworth (*Agrostio castellanae-Celticion giganteae*)
Celtis australis L. (*Fraxino angustifoliae-Ulmenion minoris*)
Cenchrus ciliaris L. (*Hyparrhenion sinaicae*)
Centaurea africana Lam. (*Quercion lusitanicae*)
Centaurea aristata Hoffmanns & Link subsp. *geresensis* (J. Arènes) Dostál (*Centaureo geresensis-Rumicetum indurati*)
Centaurea aristata Hoffmanns & Link subsp. *langeana* (Willk.) Dostál (*Agrostio castellanae-Celticion giganteae*)
Centaurea aspera L. subsp. *aspera* (*Carthametalia lanati*)
Centaurea aspera L. subsp. *stenophylla* (Dufour) Nyman (*Bromo-Piptatherion miliacei*)
Centaurea bethurica E. López & Devesa (*Brachypodion phoenicoidis*)
Centaurea calcitrapa L. (*Onopordenea acanthii*)
Centaurea collina L. (*Carthametalia lanati*)
Centaurea crocata Franco (*Quercion lusitanicae*)
Centaurea cyanus L. (*Centaureetalia cyani*)
Centaurea geresensis (see *Centaurea aristata* subsp. *geresensis*)
Centaurea herminii Rouy subsp. *herminii* (*Hieracio castellani-Plantaginion radicatae*)
Centaurea herminii Rouy subsp. *lusitanica* (J. Arènes) Franco (*Centaureo lusitanicae-Pseudarrhenatheretum longifolii*)
Centaurea interrupta (see *Centaurea ornata* subsp. *interrupta*)
Centaurea langeana (see *Centaurea aristata* subsp. *langeana*)
Centaurea lusitanica (see *Centaurea herminii* subsp. *lusitanica*)
Centaurea melitensis L. (*Thero-Brometalia*)
Centaurea micrantha Dufour (*Arrhenathero bulbosi-Stipetum giganteae*)
Centaurea nigra L. subsp. *rivularis* (Brot.) Cout. (*Molinietalia caeruleae*)
Centaurea ornata Willd. subsp. *interrupta* (Hoffmanns. & Link) Franco (*Festucion duriotaganae*)
Centaurea ornata Willd. subsp. *ornata* (*Festucion duriotaganae*)
Centaurea polyacantha (see *Centaurea sphaerocephala* var. *polyacantha*)
Centaurea pullata L. (*Thero-Brometalia*)
Centaurea rivularis (see *Centaurea nigra* subsp. *rivularis*)
Centaurea sphaerocephala L. var. *polyacantha* (Willd.) Rivas Mart. (*Sporobolion arenarii*)
Centaurea stenophylla (see *Centaurea aspera* subsp. *stenophylla*)
Centaurea vicentina Mariz (*Quercion lusitanicae*)
Centaureum chloodes (Brot.) Samp. (*Nano-Cyperion*)
Centaureum erythraea Rafn. subsp. *erythraea* (*Festuco-Brometea*)
Centaureum erythraea Rafn. subsp. *grandiflorum* (Biv.) Melderis (*Festuco-Brometea*)
Centaureum erythraea Rafn. subsp. *majus* (Hoffmanns & Link) Melderis (*Festuco-Brometea*)
Centaureum grandiflorum (see *Centaureum erythraea* subsp. *grandiflorum*)
Centaureum majus (see *Centaureum erythraea* subsp. *majus*)
Centaureum maritimum (L.) Fritsch (*Isoetion*)
Centaureum portensis (Brot.) (*Daboecion cantabricae*)
Centaureum pulchellum (Sw.) Druce (*Isoeto-Nano-Juncetea*)
Centaureum scilloides (L. f.) Samp. (*Tolpido azoricae-Holcetea rigidi*)
Centaureum spicatum (L.) Fritsch (*Saginetea maritimae*)
Centaureum tenuiflorum (Hoffmanns. & Link) Fritsch (*Juncion maritimi*)
Centranthus calcitrapae (L.) Dufresne (*Cardaminetea hirsutae*)
Centranthus ruber (L.) DC. (*Parietario-Galion muralis*)
Centunculus minimus L. (*Isoeto-Nano-Juncetea*)
Cephalanthera longifolia (L.) Fritsch (*Quercio-Fagetea*)
Cephalanthera rubra (L.) Rich (*Quercio-Fagetea*)
Cephalozia connivens (Dicks.) Lindb. (*Erico tetralicis-Sphagnetalia papilloso*)
Cerastium brachypetalum Desportes ex Per. subsp. *brachypetalum* (*Tuberarietea guttatae*)
Cerastium diffusum Pers. (*Thero-Airion*)
Cerastium fontanum Baumg. subsp. *vulgare* (Hartm.) Greuter & Burdet (*Molinio-Arrhenatheretea*)
Cerastium glomeratum Thuill. (*Stellarietea mediae*)
Cerastium pumilum Curtis (*Tuberarietea guttatae*)
Cerastium ramosissimum Boiss. (*Molinieriellion laevis*)
Cerastium semidecandrum L. (*Tuberarietea guttatae*)
Cerastium vagans Lowe (*Lauro azoricae-Juniperetea brevifoliae*)
Cerastium vulgare (see *Cerastium fontanum* subsp. *vulgare*)
Ceratocapnos claviculata (L.) Lidén subsp. *claviculata* (*Quercetalia roboris*)
Ceratocapnos heterocarpa Durieu (*Parietarion lusitanico-mauritanicae*)
Ceratonia siliqua L. (*Pistacio lentisci-Rhamnetalia alaterni*)
Ceratophyllum demersum L. (*Ceratophyllion demersi*)
Cerintho major L. (*Cerintho majoris-Fedion cornucopiae*)
Ceterach lolegnamense Gibby & Lovis (*Cymbalario-Asplenion*)
Chaenorhinum lusitanicum (see *Chaenorhinum serpyllifolium* subsp. *lusitanicum*)
Chaenorhinum minimus (L.) Lang. (*Brachypodion distachyi*)
Chaenorhinum organifolium (L.) Kostel subsp. *organifolium* (*Asplenieta trichomanes*)
Chaenorhinum serpyllifolium (Lange) Lange subsp. *lusitanicum* R. Fern. (*Linarion pedunculatae*)
Chaerophyllum azoricum Trelaese (*Pericallion malvifoliae*)
Chaerophyllum temulum L. (*Alliarienion petiolatae*)
Chaetopogon fasciculatus (Link) Hayek (*Agrostion pourretii*)
Chamaemeles coriacea Lindl. (*Mayteno umbellatae-Oleion maderensis*)
Chamaemelum fuscum (Brot.) Vasc. (*Spergulo-Arabidopsienion thalianae*)
Chamaemelum mixtum (L.) All. (*Scleranthion annui*)
Chamaemelum nobile (L.) All. (*Lolio perennis-Plantaginion majoris*)
Chamaerops humilis L. (*Pistacio lentisci-Rhamnetalia alaterni*)
Chamaesyce canescens (L.) Prokh. (*Chamaesycion prostratae*)
Chamaesyce maculata (L.) Small (*Chamaesycion prostratae*)
Chamaesyce prostrata (Aiton) Small (*Chamaesycion prostratae*)

- Chamaesyce serpens** (Kunth) Small (*Chamaesycion prostratae*)
- Chara aspera** Deth ex Willd (*Charion fragilis*)
- Chara braunii** Gmel. (*Charetalia hispidae*)
- Chara canescens** Desv. & Lois (*Charion canescentis*)
- Chara connivens** Salzm. ex A. Braun (*Charion fragilis*)
- Chara fragilis** Desv. (*Charetea fragilis*)
- Chara hispida** L. var. **hispida** (*Charion fragilis*)
- Chara imperfecta** A. Braun (*Charion vulgaris*)
- Chara vulgaris** L. var. **contraria** (A. Braun ex Kütz.) J. A. Moore (*Charetea fragilis*)
- Chara vulgaris** L. var. **vulgaris** (*Charion vulgaris*)
- Cheilanthes acrostica** (Balbis) Tadaro (*Asplenietalia petrarachae*)
- Cheilanthes guanchica** Bolle (*Cheilanthesalia maranto-maderensis*)
- Cheilanthes hispanica** Mett. (*Cheilanthion hispanicae*)
- Cheilanthes maderensis** Lowe (*Cheilanthesalia maranto-maderensis*)
- Cheilanthes tinaei** Tod. (*Androsacetalia vandellii*)
- Cheiranthus cheiri** L. (*Parietarietalia*)
- Cheirolophus massonianus** Lowe (*Soncho ustulati-Artemision argenteae*)
- Cheirolophus sempervirens** (L.) Pomel (*Stachyo lusitanicae-Cheirolophenion sempervirentis*)
- Cheirolophus uliginosus** (Brot.) Dostál (*Genistion micrantho-anglicae*)
- Chelidonium majus** L. (*Parietarietalia*)
- Chenoleoides tomentosa** (Lowe) A. Hansen & Sunding (*Forsskaoleo angustifoliae-Rumicetalia lunariae*)
- Chenopodium album** L. (*Stellarietalia mediae*)
- Chenopodium ambrosioides** L. (*Chenopodietaalia muralis*)
- Chenopodium chenopodioides** (L.) Aellen (*Chenopodion rubri*)
- Chenopodium glaucum** L. (*Chenopodion rubri*)
- Chenopodium murale** L. (*Chenopodion muralis*)
- Chenopodium opulifolium** Schrad. ex Koch & Ziz (*Chenopodion muralis*)
- Chenopodium polyspermum** L. (*Polygono-Chenopodion polyspermi*)
- Chenopodium pumilum** R.Br. (*Chenopodion rubri*)
- Chenopodium urbicum** L. (*Chenopodion muralis*)
- Chenopodium vulvaria** L. (*Chenopodion muralis*)
- Chondrilla juncea** L. (*Onopordenea acanthii*)
- Chrozophora tinctoria** (L.) Raf. (*Diplotaxion eruroidis*)
- Chrysanthemum coronarium** L. var. **coronarium** (*Hordeion leporini*)
- Chrysanthemum coronarium** L. var. **discolor** d'Urv. (*Hordeion leporini*)
- Chrysanthemum segetum** L. (*Solano nigri-Polygonetalia convolvuli*)
- Chrysosplenium oppositifolium** L. (*Caricion remotae*)
- Cicendia filiformis** (L.) Dalarbre (*Cicendion*)
- Cichorium endivia** L. subsp. **pumilum** (Jacq.) Cout. (*Onopordetalia acanthii*)
- Cichorium intybus** L. (*Onopordenea acanthii*)
- Cichorium pumilum* (see *Cichorium endivia* subsp. *pumilum*)
- Cinclidotus fontinaloides** (Hedw.) P. Beauv. (*Montio-Cardaminetalia*)
- Circaea lutetiana** L. (*Populetaalia albae*)
- Cirsium filipendulum** Lange (*Daboecion cantabricae*)
- Cirsium latifolium** Lowe (*Sibthorpio peregrinae-Clethrion arboreae*)
- Cirsium palustre** (L.) Scop. (*Molinietalia caeruleae*)
- Cirsium pyrenaicum** (Jacq.) All. (*Holoschoenetalia vulgaris*)
- Cirsium vulgare** (Savi) Ten (*Artemisietea vulgaris*)
- Cirsium welwitschii** Cosson (*Genistion micrantho-anglicae*)
- Cistanche phelypaea** (L.) Cout. (*Sarcocornietalia fruticosae*)
- Cistus albidus** L. (*Rosmarinetaea officinalis*)
- Cistus crispus** L. (*Lavanduletalia stoechadis*)
- Cistus ladanifer** L. (*Lavanduletalia stoechadis*)
- Cistus laurifolius** L. (*Cistion laurifolii*)
- Cistus libanotis** L. (*Coremation albi*)
- Cistus monspeliensis** L. (*Lavanduletalia stoechadis*)
- Cistus palhinhae** Ingram (*Stauracanthion boivinii*)
- Cistus populifolius** L. (*Lavanduletalia stoechadis*)
- Cistus psilosepalus** Sweet (*Ericion umbellatae*)
- Cistus salviifolius** L. (*Cisto-Lavanduletea*)
- Cistus x pulverulentus** Pourr. (*Lavandulo luisieri-Cistenion albidii*)
- Cladium mariscus** (L.) Pohl. (*Magno-Caricetalia*)
- Clematis campaniflora** Brot. (*Osmundo-Alnion*)
- Clematis cirrhosa** L. (*Quercu rotundifoliae-Oleion sylvestris*)
- Clematis flammula** L. (*Quercetalia ilicis*)
- Clematis vitalba** L. (*Rhamno-Prunetea*)
- Cleome violacea** L. (*Tuberarion guttatae*)
- Cleonia lusitana** (L.) L. (*Brachypodion distachyi*)
- Clethra arborea** Aiton (*Sibthorpio peregrinae-Clethrion arboreae*)
- Clinopodium arundanum* (see *Clinopodium vulgare* subsp. *arundanum*)
- Clinopodium vulgare** L. subsp. **arundanum** (Boiss.) Nyman (*Origanion virentis*)
- Clinopodium vulgare** L. subsp. **vulgare** (*Trifolio medii-Geranietea sanguinei*)
- Cnicus benedictus** L. (*Chenopodion muralis*)
- Cochlearia danica** L. (*Saginion maritimae*)
- Cochlearia glastifolia** L. (*Molinio arundinacea-Holoschoenion vulgaris*)
- Coincya cheiranthos** Vill. var. **recurvata** (All.) Leadlay (*Centaureo geresensis-Rumicetum indurati*)
- Coincya cintrana* (see *Coincya pseudoerucastrum* subsp. *cintrana*)
- Coincya hispida** (Cav.) Greuter & Burdet subsp. **hispida** (*Alyso granatensis-Brassicion barrelieri*)
- Coincya hispida** (Cav.) Greuter & Burdet subsp. **transtagana** (Cout.) Greuter & Burdet (*Alyso granatensis-Brassicion barrelieri*)
- Coincya johnstonii** (Samp.) Greuter & Burdet (*Helichrysum picardii*)
- Coincya nevadensis** (Willk.) Rivas-Mart. subsp. **orophila** (Franco) Rivas-Mart. (*Linario saxatilis-Senecionion carpetani*)
- Coincya orophila* (see *Coincya nevadensis* subsp. *orophila*)
- Coincya pseudoerucastrum** (Brot.) Greuter & Bourdet subsp. **cintrana** (Cout.) Greuter & Bourdet (*Calendulo lusitanicae-Antirrhinion linkiani*)
- Coincya pseudoerucastrum** (Brot.) Greuter & Bourdet subsp. **pseudoerucastrum** (*Rumici indurati-Dianthion lusitani*)
- Coincya pseudoerucastrum** (Brot.) Greuter & Bourdet subsp. **puberula** (Paul) Valdés (*Sesamoidion suffruticosae*)
- Coincya puberula* (see *Coincya pseudoerucastrum* subsp. *puberula*)
- Coincya recurvata* (see *Coincya cheiranthos* var. *recurvata*)
- Coincya transtagana* (see *Coincya hispida* subsp. *transtagana*)
- Colchicum multiflorum** Brot. (*Populion albae*)
- Coleostephus myconis** (L.) Rchb.f. (*Stellarietalia mediae*)
- Conium maculatum** L. (*Galio aparines-Alliarietalia petiolatae*)
- Conopodium majus** (Gouan) Loret in Loret & Barradon subsp. **marizianum** (Samp.) López Udías & G. Mateo (*Rumici indurati-Dianthion lusitani*)
- Conopodium marianum** Lange (*Origanenion virentis*)
- Conopodium pyrenaicum** (Loisel.) Miégev. (*Quercu-Fagetalia*)
- Conopodium subcarneum** (Boiss. & Reuter) Boiss. & Reuter (*Linarion triornithophorae*)
- Convolvulus althaeoides** L. (*Lygeo-Stipetea*)
- Convolvulus arvensis** L. (*Elytrigietalia repentis*)
- Convolvulus lineatus** L. (*Astragalo-Poion bulbosae*)
- Convolvulus massonii** F. Dietr. (*Mayteno umbellatae-Oleion maderensis*)

- Convolvulus meoanthus** Hoffmanns & Link (*Cerintho majoris-Fedion cornucopiae*)
- Convolvulus siculus** L. (*Sisymbrietalia officinalis*)
- Convolvulus tricolor** L. (*Cerintho majoris-Fedion cornucopiae*)
- Conyza albida** Willd ex Speng. (*Chenopodion muralis*)
- Conyza bonariensis** (L.) Cronq. (*Chenopodion muralis*)
- Conyza canadensis** (L.) Cronq. (*Chenopodietalia muralis*)
- Conyza sumatrensis** (Retz) E. Walker (*Chenopodion muralis*)
- Corema album** (L.) D. Don (*Rubio longifoliae-Coremation albi*)
- Corema azorica** (P. Silva) Rivas Mart., Lousã, Fern. Prieto, Dias, J.C. Costa & Aguiar (*Ericetalia azoricae*)
- Cornus sanguinea** L. (*Rhamno-Prunetea*)
- Coronilla dura** (Cav.) Boiss. (*Tuberarion guttatae*)
- Coronilla glauca** L. (*Pistacio lentisci-Rhamnetalia alaterni*)
- Coronilla juncea** L. (*Pistacio lentisci-Rhamnetalia alaterni*)
- Coronilla minima** L. subsp. **minima** (*Rosmarinetea officinalis*)
- Coronilla repanda** (Poir.) Guss. (*Malcolmietalia*)
- Coronilla scorpioides** (L.) W.D.J. Koch (*Roemerion hybridae*)
- Coronopus didymus** (L.) Sm. (*Polygono-Poetea annuae*)
- Coronopus squamatus** (Forssk.) Asch. (*Sclerochloa durae-Coronopodion squamati*)
- Corrigiola litoralis** L. (*Chenopodion rubri*)
- Corydalis cava** (L.) Schweigg. & Körte (*Fagetalia sylvaticae*)
- Corylus avellana** L. (*Betulo pendulae-Populetales tremulae*)
- Corynephorus canescens** (L.) P. Beauv. var. **canescens** (*Hieracio castellani-Plantaginion radicatae*)
- Corynephorus canescens** (L.) P. Beauv. var. **maritimus** Godr. (*Corynephorion maritimi*)
- Corynephorus fasciculatus** Boiss. & Reuter (*Hymenocarpo hamosi-Malcolmion trilobae*)
- Corynephorus macrantherus** Boiss. & Reut. (*Hymenocarpo hamosi-Malcolmion trilobae*)
- Corynephorus maritimus* (see *Corynephorus canescens* var. *maritimus*)
- Cosentinia vellea** (Aiton) Todaro (*Asplenietalia petrarchae*)
- Cotula australis** (Sieb. ex Spreng.) Hook f. (*Polygono-Poetea annuae*)
- Cotula coronopifolia** L. (*Spergulario-Paspalenion vaginati*)
- Crambe fruticosa** L.f. (*Mayteno umbellatae-Oleion maderensis*)
- Crassula tillaea** Lest.-Garl. (*Polycarpion tetraphylli*)
- Crassula vaillantii** (Willd.) Roth (*Isoetalia*)
- Crataegus monogyna** Jacq. (*Rhamno-Prunetea*)
- Crepis andryaloides** Lowe (*Sinapidendro angustifolii-Aeonion glutinosi*)
- Crepis capillaris** (L.) Wallr. (*Molinio-Arrhenatheretea*)
- Crepis divaricata** (Lowe) F.W. Schultz (*Euphorbio paraliae-Lotion floridis*)
- Crepis foetida** L. (*Chenopodio-Stellarienea*)
- Crepis lamsanoides** (Gouan) Tausch (*Quercu-Fagetea*)
- Crepis pulchra** L. (*Stellarietea mediae*)
- Crepis pusilla** (Sommier) Merxm. (*Polycarpion tetraphylli*)
- Crepis taraxacifolia** Thuill. (*Sisymbrietalia officinalis*)
- Crepis vesicaria* subsp. *haenseleri* (see *Crepis taraxacifolia*)
- Cressa cretica* (see *Cressa villosae* var. *villosa*)
- Cressa cretica** L. var. **villosa** Hoffmanns. & Link (*Thero-Suaedion*)
- Crithmum maritimum** L. (*Crithmo-Limonietea*)
- Crococsmia x crocosmiiflora** (G. Nicholson) N.E. Br. (*Ageratinio adenophorae-Ipomaeion acuminatae*)
- Crocus carpetanus** Boiss. & Reut. (*Campanulo herminii-Nardion strictae*)
- Crucianella angustifolia** L. (*Tuberarietea guttatae*)
- Crucianella maritima** L. (*Crucianelletalia maritimae*)
- Cruciata glabra** (L.) Eherend. (*Trifolio medii-Geranietea sanguinei*)
- Cruciata laevipes** Opiz (*Galio aparines-Alliarietalia petiolatae*)
- Crupina vulgaris** Cass. (*Tuberarietea guttatae*)
- Crypsis aculeata** (L.) Aiton (*Verbenion supinae*)
- Crypsis alopecuroides** (Piller & Mitterp.) Schrad. (*Verbenion supinae*)
- Crypsis schoenoides** (L.) Lam. (*Verbenion supinae*)
- Cryptogramma crispa** (L.) R.Br. ex Hooker (*Dryopteridion oreadis*)
- Ctenidium molluscum** (Hedwg.) Mitt. (*Polypodion cambrici*)
- Ctenopsis delicatula** (Lag.) Paunero (*Molinieriellion laevis*)
- Cucubalus baccifer** L. (*Calystegietales sepium*)
- Cullen americanum** (L.) Rydb. (*Thero-Brometalia*)
- Cutandia maritima** (L.) W. Barbey (*Cutandietalia maritimae*)
- Cymbalaria muralis** Gaertn., B. Mey. & Schreb. (*Parietarietalia*)
- Cymodocea nodosa** (Ucria) Asch. (*Halodulo wrightii-Thalassietea testudinum*)
- Cynanchum acutum** L. (*Senecionion fluviatilis*)
- Cynara algarbiensis** Mariz (*Stachyo lusitanicae-Cheirolophenion sempervirentis*)
- Cynara cardunculus** L. var. **cardunculus** (*Urtico piluliferae-Silybion mariani*)
- Cynara cardunculus** L. var. **ferocissima** Lowe (*Scolymomaculati-Cynaretum ferocissimae*)
- Cynara ferocissima* (see *Cynara cardunculus* var. *ferocissima*)
- Cynara humilis** L. (*Onopordion castellani*)
- Cynara tournefortii** Boiss. & Reut. (*Onopordion castellani*)
- Cynodon dactylon** (L.) Pers. (*Trifolio fragiferi-Cynodontion*)
- Cynoglossum cheirifolium** L. (*Carthametalia lanati*)
- Cynoglossum clandestinum** Desf. (*Carthametalia lanati*)
- Cynoglossum creticum** Mill. (*Carthametalia lanati*)
- Cynomorium coccineum** L. (*Salsolo oppositifoliae-Suaedion pruinosae*)
- Cynosurus cristatus** L. (*Cynosurion cristati*)
- Cyperus badius* (see *Cyperus longus* subsp. *badius*)
- Cyperus capitatus** Vandelli (*Euphorbio paraliae-Ammophiletea arundinaceae*)
- Cyperus difformis** L. (*Oryzo sativae-Echinochloion oryzoides*)
- Cyperus distachyos* (see *Cyperus laevigatus* subsp. *distachyos*)
- Cyperus eragrostis** Lam. (*Holoschoenetalia vulgaris*)
- Cyperus flavescens** L. (*Nano-Cyperetalia*)
- Cyperus fuscus** L. (*Nano-Cyperion*)
- Cyperus laevigatus** L. subsp. **distachyos** (All.) Ball (*Trifolio fragiferi-Cynodontion*)
- Cyperus longus** L. subsp. **badius** (Desf.) Bonnier & Layens (*Potentillo anserinae*)
- Cyperus longus** L. subsp. **longus** (*Magno-Caricion elatae*)
- Cyperus michelianus** (L.) Link (*Nano-Cyperetalia*)
- Cyperus rotundus** L. (*Diplotaxion erucoidis*)
- Cyrtomium falcatum** (L.f.) C. Presl. (*Parietarietalia*)
- Cystopteris diaphana** (Bory) Blasdell (*Thebypterido pozoii-Woodwardion radicans*)
- Cystopteris dickieana** R. Sim. (*Androsacetalia vandellii*)
- Cystopteris fragilis** (L.) Bernh. (*Asplenietea trichomanes*)
- Cytinus hypocistis** (L.) L. subsp. **hypocistis** (*Lavanduletalia stoechadis*)
- Cytinus hypocistis** (L.) L. subsp. **macranthus** Wettst. (*Cisto-Lavanduletea*)
- Cytinus macranthus* (see *Cytinus hypocistis* subsp. *macranthus*)
- Cytinus ruber** Fourr. ex Fritsch (*Rosmarinetalia officinalis*)
- Cytisus baeticus** (Webb) Steud. (*Cytisetetea scopario striati*)
- Cytisus bourgaei* (see *Cytisus scoparius* subsp. *bourgaei*)
- Cytisus cabezudo* (see *Cytisus grandiflorus* subsp. *cabezudo*)
- Cytisus eriocarpus* (see *Cytisus striatus* subsp. *eriocarpus*)
- Cytisus grandiflorus** (Brot.) DC. subsp. **cabezudo** Talavera (*Retamion monospermae*)
- Cytisus grandiflorus** (Brot.) DC. subsp. **grandiflorus** (*Cytisetalia scopario-striati*)
- Cytisus multiflorus** (L'Hér.) Sweet (*Cytisetalia scopario-striati*)

- Cytisus oromediterraneus** Rivas Mart., T.E. Díaz, Fern. Prieto, Loidi & Penas (*Cytisetalia scopario-striati*)
Cytisus oxyphyllus (see *Cytisus scoparius* subsp. *scoparius* var. *oxyphyllus*)
- Cytisus scoparius** (L.) Link subsp. **bourgaei** (Boiss.) Rivas Mart., Fern. Gonz. & Sánchez Mata (*Retamion sphaerocarpaceae*)
- Cytisus scoparius** (L.) Link subsp. **scoparius** var. **oxyphyllus** (Boiss.) Briq. (*Ulici europaei-Cytision striati*)
- Cytisus scoparius** (L.) Link subsp. **scoparius** var. **scoparius** (*Cytisetalia scopario-striati*)
- Cytisus striatus** (Hill) Rothm subsp. **striatus** (*Ulici europaei-Cytision striati*)
- Cytisus striatus** (Hill) Rothm. subsp. **eriocarpus** (Boiss. & Reut.) Rivas Mart. (*Genistion floridae*)
- Daboecia azorica** Tutin ex E.F. Warb. (*Daboecion azoricae*)
- Daboecia cantabrica** (Huds.) C. Koch (*Daboecion cantabricae*)
- Dactylis glomerata** L. subsp. **glomerata** (*Molinio-Arrhenatheretea*)
- Dactylis glomerata** L. subsp. **lusitanica** (Stebbins & Zohary) Rivas Mart. & Izco (*Stipo-Agrostietea castellanae*)
- Dactylis hispanica** Roth (*Lygeo-Stipetea*)
Dactylis hylodes (see *Dactylis smithii* subsp. *hylodes*)
Dactylis lusitanica (see *Dactylis glomerata* subsp. *lusitanica*)
- Dactylis marina** Borril (*Crithmo-Armerion maritimae*)
- Dactylis smithii** Link subsp. **hylodes** Parker (*Hyparrhenion sinaicae*)
Dactylorhiza caramulensis (see *Dactylorhiza maculata* subsp. *caramulensis*)
- Dactylorhiza elata** (Poir.) Soó subsp. **sesquipedalis** (Willd.) Soó (*Molinio-Arrhenatheretea*)
- Dactylorhiza foliosa** (Verm.) Soó (*Ranunculo cortusifolii-Geranion canariensis*)
- Dactylorhiza insularis** (Sommier) Laudwehr (*Trifolio medii-Geranietea sanguinei*)
- Dactylorhiza maculata** (L.) Soó subsp. **caramulensis** Vermeulen (*Cynosurion cristati*)
- Dactylorhiza maculata** (L.) Soó subsp. **maculata** (*Molinietalia caeruleae*)
- Damasonium alisma** Mill. (*Isoeto-Nano-Juncetea*)
- Damasonium bourgaei** Coss. (*Isoeto-Nano-Juncetea*)
- Damasonium polyspermum** Coss. (*Isoeto-Nano-Juncetea*)
- Danthonia decumbens** (L.) DC. (*Nardetalia strictae*)
- Daphne gnidium** L. (*Quercetea ilicis*)
- Daphne gnidium** L. var. **maritima** Rozeira (*Dactylo maritimae-Ulicion maritimi*)
- Daphne laureola** L. subsp. **laureola** (*Quercu-Fagetea*)
- Datura stramonium** L. (*Chenopodion muralis*)
- Daucus azoricus** (Franco) Rivas Mart., Lousã, Fern. Prieto, Dias, J.C. Costa & Aguiar (*Euphorbio azoricae-Festucion petraeae*)
- Daucus carota** L. subsp. **carota** (*Artemisietea vulgaris*)
- Daucus crinitus** Desf. (*Hyparrhenion sinaicae*)
- Daucus durieua** Lange in Willk & Lange (*Brachypodion distachyi*)
- Daucus gummifer** Sime (*Crithmo-Armerion maritimae*)
- Daucus halophilus** Brot. (*Crithmo-Daucion halophili*)
- Daucus maximus** Desf. (*Onopordion castellani*)
- Daucus muricatus** (L.) L. (*Hordeion leporini*)
- Daucus setifolius** Desf. (*Festucion duriotaganae*)
- Davallia canariensis** (L.) Sm. (*Anomodonto-Polypodietalia*)
- Delphinium gracile** DC. (*Stellarietea mediae*)
- Delphinium halteratum** Sm. subsp. **halteratum** (*Stellarietea mediae*)
- Delphinium halteratum** Sm. subsp. **verdunense** (Balb.) Graebn. (*Stellarietea mediae*)
- Delphinium pentagynum** Lam. (*Roemerion hybridae*)
Delphinium verdunense (see *Delphinium halteratum* subsp. *verdunense*)
- Deschampsia argentea** (Lowe) Lowe (*Deschampsion argenteae*)
- Deschampsia caespitosa** (L.) P. Beauv. subsp. **caespitosa** (*Molinietalia caeruleae*)
Deschampsia flexuosa (see *Avenella flexuosa* subsp. *flexuosa*)
Deschampsia foliosa (see *Avenella foliosa*)
- Deschampsia gallaecica** (Cervi & Romo) García Suárez, Fernández-Carvajal & Fernández Prieto (*Juncion acutiflori*)
- Deschampsia iberica** (see *Avenella flexuosa* subsp. *iberica*)
- Deschampsia maderensis** (Hack & Bornm.) Buschm. (*Deschampsio maderensis-Parafestucion albidae*)
Deschampsia stricta (see *Avenella stricta*)
- Dianthus armeria** L. (*Trifolio medii-Geranietea sanguinei*)
Dianthus barbatus (see *Dianthus cintranus* subsp. *barbatus*)
- Dianthus broteri** Boiss. & Reut. subsp. **broteri** (*Phagnalo saxatilis-Rumicetalia indurati*)
- Dianthus broteri** Boiss. & Reut. subsp. **hinoxianus** (Galego) Rivas Mart. (*Coremation albi*)
Dianthus caespitosifolius (see *Dianthus laricifolius* subsp. *caespitosifolius*)
- Dianthus cintranus** Boiss. & Reut. subsp. **barbatus** R. Fernandes & Franco (*Calendulo lusitanicae-Antirrhinion linkiani*)
- Dianthus cintranus** Boiss. & Reuter subsp. **cintranus** (*Crithmo-Daucion halophili*)
- Dianthus crassipes** R. Roem. subsp. **crassipes** (*Rumici indurati-Dianthion lusitani*)
Dianthus hinoxianus (see *Dianthus broteri* subsp. *hinoxianus*)
- Dianthus langeanus** Willk. in Willk. & Lange (*Festucetalia curvifoliae*)
- Dianthus laricifolius** Boiss. & Reut. subsp. **caespitosifolius** (Planellas) Lainz (*Festucion duriotaganae*)
- Dianthus laricifolius** Boiss. & Reut. subsp. **laricifolius** (*Hieracio castellani-Plantaginion radicatae*)
- Dianthus laricifolius** Boiss. & Reut. subsp. **marizii** (Samp.) Franco (*Armerion eriophyllae*)
- Dianthus lusitanus** Brot. (*Rumici indurati-Dianthion lusitani*)
Dianthus marizii (see *Dianthus laricifolius* subsp. *marizii*)
- Dicranum scottianum** Turn. (*Dicrano scottiani-Adiantetum capilli-veneris*)
- Didymodon spadiceus** (Mitt.) Limpr. (*Adiantion capilli-veneris*)
- Didymodon tophaceus** (Brid.) Lisa (*Adiantetalia capilli-veneris*)
- Digitalis amandiana* (see *Digitalis purpurea* subsp. *amandiana*)
- Digitalis carpetana* (see *Digitalis purpurea* subsp. *carpetana*)
- Digitalis heywoodii* (see *Digitalis purpurea* subsp. *heywoodii*)
- Digitalis mariana* (see *Digitalis purpurea* subsp. *mariana*)
- Digitalis purpurea** L. subsp. **amandiana** (Samp.) Hinz (*Rumici indurati-Dianthion lusitani*)
- Digitalis purpurea** L. subsp. **carpetana** (Rivas Mateos) Rivas Mart., Fern. Gonz. & Sánchez Mata (*Linario saxatilis-Senecionion carpetani*)
- Digitalis purpurea** L. subsp. **heywoodii** P. Silva & M. Silva (*Rumici indurati-Dianthion lusitani*)
- Digitalis purpurea** L. subsp. **mariana** (Boiss) Rivas Goday (*Rumici indurati-Dianthion lusitani*)
- Digitalis purpurea** L. subsp. **purpurea** (*Carici piluliferae-Epilobion angustifolii*)
- Digitalis thapsi** L. (*Rumici indurati-Dianthion lusitani*)
- Digitalis tomentosa** Hoffmanns. & Link (*Quercenion broteroi*)
- Digitaria ischaemum** (Schreb.) Muhl. (*Polygono-Chenopodion polyspermi*)
- Digitaria sanguinalis** (L.) Scop. (*Polygono-Chenopodion polyspermi*)
- Dipcadi serotinum** (L.) Medik. (*Lygeo-Stipetea*)
- Diphasiastrum maderense** (J.H. Wilce) Holub (*Daboecion azoricae*)

- Diploaxis erucoides** (L.) DC. (*Solano nigri-Polygonetalia convolvuli*)
- Diploaxis muralis** (L.) DC. (*Diploaxis erucoidis*)
- Diploaxis siifolia** G. Kunze (*Chenopodio-Stellarienea*)
- Diploaxis virgata** (Cav.) DC. (*Hordeion leporini*)
- Dipsacus comosus** Hoffmanns. & Link (*Artemisietea vulgaris*)
- Dipsacus fullonum** L. (*Balloto-Conion maculati*)
- Dittrichia graveolens** (L.) Greuter (*Diploaxis erucoidis*)
- Dittrichia maritima** Brullo & De Marco (*Crithmo-Daucion halophili*)
- Dittrichia revoluta* (see *Dittrichia viscosa* subsp. *revoluta*)
- Dittrichia viscosa** (L.) Greuter subsp. **revoluta** (Hoffmanns. & Link) P. Silva & Tutin (*Bromo-Piptatherion miliacei*)
- Dittrichia viscosa** (L.) Greuter subsp. **viscosa** (*Bromo-Piptatherion miliacei*)
- Doronicum plantagineum** L. (*Quercetalia ilicis*)
- Dorycnium pentaphyllum** Scop. subsp. **pentaphyllum** (*Rosmarinetea officinalis*)
- Dorycnium rectum** (L.) Ser. (*Molinio arundinacea-Holochoenion vulgaris*)
- Draba muralis** L. (*Cardamino hirsutae-Geranietea purpurei*)
- Dracaena draco** (L.) L. (*Rhamno crenulatae-Oleetea cerasiformis*)
- Drepanolejeunea hamatifolia** (Hook.) Schiffn. (*Anomodonto-Polypodietalia*)
- Drosera intermedia** Hayane (*Rhynchosporion albae*)
- Drosera rotundifolia** L. (*Oxycocco-Sphagnetea*)
- Drosophyllum lusitanicum** (L.) Link (*Stauracanthion boivini*)
- Drusa glandulosa** (Poir.) Borm. (*Geranio purpurei-Torilidion neglectae*)
- Dryopteris aemula** (Aiton) Kuntze (*Pulmonario longifoliae-Quercion roboris*)
- Dryopteris affinis** (Lowe) Fraser-Jenk. subsp. **affinis** (*Quercu-Fagetea*)
- Dryopteris aitoniana** Pic. Serm. (*Sibthorpio peregrinae-Clethrion arboreae*)
- Dryopteris azorica** (Christ) Alston (*Dryopterido azoricae-Laurion azoricae*)
- Dryopteris borreri** (Newman) Newman ex Oberholzer & Tavel (*Quercu-Fagetea*)
- Dryopteris crispifolia** Rasbach, Reichst. & Vida (*Lauro azoricae-Juniperetea brevifoliae*)
- Dryopteris dilatata** (Hofm.) A. Gray (*Quercu-Fagetea*)
- Dryopteris expansa** (C. Presl) Fraser-Jenk. & Jermy (*Dryopteridion oreadis*)
- Dryopteris filix-mas** (L.) Schott (*Quercu-Fagetea*)
- Dryopteris maderensis** Alston (*Sibthorpio peregrinae-Clethrion arboreae*)
- Dryopteris oreades** Fomin (*Dryopteridion oreadis*)
- Dryopteris x furadensis** Bennert (*Sibthorpio peregrinae-Clethrion arboreae*)
- Ecballium elaterium** (L.) A. Rich. (*Chenopodietalia muralis*)
- Echinaria capitata** (L.) Desf. (*Brachypodietalia distachyi*)
- Echinochloa colona** (L.) Link (*Digitario ischaemi-Setarienion viridis*)
- Echinochloa crus-galli** (L.) P. Beauv. subsp. **crus-galli** (*Digitario ischaemi-Setarienion viridis*)
- Echinochloa crus-galli** (L.) P. Beauv. subsp. **hispidula** (Retz) Honda (*Oryzo sativae-Echinochloion oryzoidis*)
- Echinochloa oryzoides** (Ard.) Fritsch subsp. **oryzicola** (Vasinger) Rivas Mart. (*Oryzo sativae-Echinochloion oryzoidis*)
- Echinochloa oryzoides** (Ard.) Fritsch subsp. **oryzoides** (*Oryzo sativae-Echinochloion oryzoidis*)
- Echinops strigosus** L. (*Onopordion castellani*)
- Echinospartum ibericum** Rivas Mart., Sánchez Mata & Sanchó subsp. **ibericum** (*Cytisenion multiflori*)
- Echinospartum ibericum pulviniformis** (Rivas Mart.) Rivas Mart. (*Cytisenion oromediterranei*)
- Echinospartum pulviniformis** (see *Echinospartum ibericum* subsp. *pulviniformis*)
- Echium boissieri** Steud. (*Onopordion castellani*)
- Echium candicans** L.f. (*Bystropogono punctati-Telinion maderensis*)
- Echium creticum** L. subsp. **algarbiensis** R. Fernandes (*Onopordion castellani*)
- Echium creticum** L. subsp. **coincyanum** (Laicata) R. Fernandes (*Carthametalia lanati*)
- Echium gaditanum** Boiss. (*Corynephorion maritimi*)
- Echium lusitanicum** L. subsp. **lusitanicum** (*Dauco-Melilotion*)
- Echium nervosum** Dryand. (*Mayteno umbellatae-Oleion maderensis*)
- Echium plantagineum** L. (*Echio plantaginei-Galactition tomentosae*)
- Echium portosanctensis** J.A. Carvalho, Pontes, Batista-Marques & R. Jardim (*Mayteno umbellatae-Oleion maderensis*)
- Echium rosulatum** Lange (*Dauco-Melilotion*)
- Echium tuberculatum** Hoffmanns. & Link (*Carthametalia lanati*)
- Echium vulgare** L. (*Artemisietea vulgaris*)
- Elaeoselinum gummiferum** (Desf.) Tutin (*Agrostio castellanae-Celticium giganteae*)
- Elaeoselinum tenuifolium** (Lag.) Lange in Wilk. & Lange (*Rosmarinetea officinalis*)
- Elaphoglossum semicylindricum** (Bowed.) Benl. (*Hymenophyllum tunbrigensis*)
- Elatine alsinastrum** L. (*Nano-Cyperion*)
- Elatine hexandra** (Lapierre) DC. (*Eleocharition acicularis*)
- Elatine macropoda** Guss. (*Isoeto-Nano-Juncetea*)
- Elatine triandra** Schkuhr (*Nano-Cyperetalia*)
- Eleocharis acicularis** (L.) Roem & Schultz (*Eleocharition acicularis*)
- Eleocharis multicaulis** (Sm.) Desv. (*Eleocharition multicaulis*)
- Eleocharis palustris** (L.) Roem. & Schult subsp. **palustris** (*Glycerio-Sparganion*)
- Eleocharis palustris** (L.) Roem. & Schult. subsp. **vulgaris** Walters (*Magno-Carici elatae-Phragmitetea australis*)
- Eleocharis vulgaris* (see *Eleocharis palustris* subsp. *vulgaris*)
- Eleogiton fluitans** (L.) Link (*Eleocharition multicaulis*)
- Eleusine indica** (L.) Gaertn. (*Chamaesyction prostratae*)
- Eleusine tristachya** (Lam.) Lam. (*Chamaesyction prostratae*)
- Elodea canadensis** Michx. (*Potametalia*)
- Elymus caninus** (L.) L. (*Salici purpureae-Populetea nigrae*)
- Elymus elongatus* (see *Elytrigia elongata*)
- Elymus farctus* subsp. *boreali-atlanticus* (see *Elytrigia juncea* subsp. *boreatlantica*)
- Elymus farctus* subsp. *farctus* (see *Elytrigia juncea* subsp. *juncea*)
- Elytrigia atherica** (Link) Kerguelen ex Carreras (*Elytrigion athericae*)
- Elytrigia boreatlantica* (see *Elytrigia juncea* subsp. *boreatlantica*)
- Elytrigia elongata** (Host) Nevski (*Juncetalia maritimi*)
- Elytrigia juncea** (L.) Nevski subsp. **boreatlantica** (Simonet & Guin.) Hyl. (*Elytrigion boreatlanticae*)
- Elytrigia juncea** (L.) Nevski subsp. **juncea** (*Elytrigietum juncea-boreatlanticae*)
- Elytrigia repens** (L.) Desv. ex Nevski (*Elytrigietalia repentis*)
- Emex spinosa** (L.) Campd. (*Chenopodietalia muralis*)
- Encalypta streptocarpa** Hedwg (*Polypodion cambrici*)
- Ephedra dissoluta* (see *Ephedra fragilis* var. *dissoluta*)
- Ephedra fragilis** Desf. var. **dissoluta** Stapf. (dif. *Rhamno crenulatae-Oleetalia cerasiformis*)
- Ephedra fragilis** Desf. var. **fragilis** (*Pistacio lentisci-Rhamnetalia alaterni*)
- Epilobium anagallidifolium** Lam. (*Montio-Cardaminetalia*)
- Epilobium angustifolium** L. (*Epilobietea angustifoliae*)
- Epilobium hirsutum** L. (*Calystegietales sepium*)

- Epilobium lanceolatum** Sebast. & Mauri (*Androsacetalia alpinae*)
- Epilobium obscurum** Schreb. (*Montio-Cardaminetalia*)
- Epilobium palustre** L. (*Caricetalia nigrae*)
- Epilobium parviflorum** Schreb. (*Calystegietalesia sepium*)
- Epilobium tetragonum** L. subsp. **tetragonum** (*Potentillo anserinae*)
- Epilobium tetragonum** L. subsp. **tournefortii** (Michalet) Rouy & E. G. Camus (*Plantaginetalesia majoris*)
- Epipactis duriensis** Bernardos, D. Tyteca, Revuelta & Amich (*Quercu-Fagetea*)
- Epipactis helleborine** (L.) Crantz subsp. **helleborine** (*Quercu-Fagetea*)
- Epipactis lusitanica** Tyteca (*Quercenion broteroi*)
- Epipactis phyllanthes** G.E. Sm. (*Pulmonario-Quercion roboris*)
- Epipactis tremolsii** C. Pau (*Aceri granatensis-Quercion fagineae*)
- Equisetum arvense** L. (*Elytrigietalia repentis*)
- Equisetum palustre** L. (*Molinietalia caeruleae*)
- Equisetum ramosissimum** Desf. (*Populetalesia albae*)
- Equisetum telmateia** Ehrh. (*Salici purpureae-Populetea nigrae*)
- Eragrostis barrelieri** Daveau (*Solano nigrae-Polygonetalia convolvuli*)
- Eragrostis minor** Host (*Matricario-Polygonion arenastris*)
- Eragrostis pilosa** (L.) P. Beauv. (*Matricario-Polygonion arenastris*)
- Erica andevalensis** Cabezudo & Ribera (*Ericenion terminaliserigenae*)
- Erica aragonensis* (see *Erica australis* subsp. *aragonensis*)
- Erica arborea** L. (*Ericion arboreae*)
- Erica australis** L. subsp. **aragonensis** (Willk) Cout. (*Ericenion aragonensis*)
- Erica australis** L. subsp. **australis** (*Ericion umbellatae*)
- Erica azorica** Hochst. (*Ericetalia azoricae*)
- Erica canariensis** Rivas-Mart., Martín Osorio & Wildpret (*Pruno hixa-Lauretea novocanariensis*)
- Erica ciliaris** Loef. ex L. (*Daboecion cantabricae*)
- Erica cinerea** L. (*Calluno-Ulicetea*)
- Erica erigena** R. Ross (*Molinio arundinacea-Holoschoenion vulgaris*)
- Erica lusitanica** Rudolphi (*Genistion micrantho-anglicae*)
- Erica maderensis** (DC.) Bornm. (*Bystropogono punctati-Telinion maderensis*)
- Erica maderincola* (see *Erica platycodon* subsp. *maderincola*)
- Erica platycodon** (Webb & Berthel.) Rivas Mart., Wildpret, Del Arco, O. Rodríguez, P. Pérez, García-Gallo, Acebes, T.E. Díaz & Fern. Gonz. subsp. **maderincola** (D.C. McClint.) Rivas Mart., Capelo, J.C. Costa, Lousã, Fontinha, Jardim & Sequeira (*Sibthorpio peregrinae-Clethron arboreae*)
- Erica scoparia** L. (*Calluno-Ulicetea*)
- Erica tetralix** L. (*Erico tetralicis-Sphagnetalia papillosi*)
- Erica umbellata** L. (*Ericion umbellatae*)
- Erigeron acer** L. (*Festuco-Brometea*)
- Erigeron karwinskianus** DC. (*Parietarietalia*)
- Eriophorum angustifolium** Honck (*Caricetalia nigrae*)
- Erodium bipinnatum** Willd. (*Malcolmietalesia*)
- Erodium botrys** (Cav.) Bertol. (*Poetalia bulbosae*)
- Erodium chium** (L.) Willd. (*Hordeion leporini*)
- Erodium laciniatum** (Cav.) Willk. (*Cutandietalia maritimae*)
- Erodium malacoides** (L.) L'Hér. (*Stellarietea mediae*)
- Erodium moschatum** (L.) L'Hér. (*Chenopodio-Stellarieneae*)
- Erodium primulaceum** Welw. ex Lange (*Plantaginion serrariae*)
- Erophila verna** (L.) Chevall. (*Tuberarietea guttatae*)
- Erica vesicaria** (L.) Cav. subsp. **sativa** (Mill.) Thell. in Hegi (*Stellarietea mediae*)
- Eryngium campestre** L. (*Onopordenea acanthii*)
- Eryngium corniculatum** Lam. (*Menthion cervinae*)
- Eryngium dilatatum** Lam. (*Teucro pseudochamaepityos-Brachypodion retusi*)
- Eryngium galioides** Lam. (*Agrostion pourretii*)
- Eryngium juresianum** (Lainz) Lainz (*Eryngio juresiani-Beuletum celtibericae*)
- Eryngium maritimum** L. (*Ammophiletalia*)
- Eryngium tenue** Lam. (*Tuberarietalia guttatae*)
- Eryngium viviparum** Gay (*Cicendion*)
- Erysimum arbuscula** (Lowe) Snog. (*Soncho ustulati-Artemision argenteae*)
- Erysimum bicolor** (Hornem.) DC. (*Rhamno crenulatae-Oleetalia cerasiformis*)
- Erysimum lagascae** Rivas Goday & Bellot (*Rumici-Dianthion lusitani*)
- Erysimum linifolium** (Poult. ex Pers.) J. Gay (*Rumici-Dianthion lusitani*)
- Erysimum maderense** Polatschek (*Soncho ustulati-Artemision argenteae*)
- Erysimum merxmülleri** Polatschek (*Linarion triornithophorae*)
- Erythronium dens-canis** L. (*Nardenalia strictae*)
- Eucladium verticillatum** (Brid.) Bruch & Schimp. (*Adiantetalia capilli-veneris*)
- Euonymus europaeus** L. (*Prunetalia spinosae*)
- Eupatorium cannabinum** L. (*Bromo ramosi-Eupatorium canabinum*)
- Euphorbia amygdaloides** L. (*Quercu-Fagetea*)
- Euphorbia anachoreta* (see *Euphorbia desfoliata*)
- Euphorbia angulata** Jacq. (*Quercetalia roboris*)
- Euphorbia azorica** Hochst. (*Euphorbio azoricae-Festucion petraeae*)
- Euphorbia boetica** Boiss. (*Helichryson picardii*)
- Euphorbia characias** L. (*Pistacio lentisci-Rhamnnetalia alaterni*)
- Euphorbia clementei** Boiss. (*Asparago albi-Rhamnion oleoidis*)
- Euphorbia desfoliata** (Menezes) Monod (*Kleinio-Euphorbietea canariensis*)
- Euphorbia dulcis** L. (*Fagetalia sylvaticae*)
- Euphorbia exigua** L. (*Brachypodietalia distachyi*)
- Euphorbia falcata** L. (*Brachypodietalia distachyi*)
- Euphorbia helioscopia** L. (*Polygono-Chenopodion polyspermi*)
- Euphorbia hirsuta** L. (*Molinio arundinacea-Holoschoenion vulgaris*)
- Euphorbia hyberna** L. (*Quercu-Fagetea*)
- Euphorbia matritensis** Boiss. (*Artemisio-Santolinion rosmarinifoliae*)
- Euphorbia mellifera** Aiton (*Euphorbion melliferae*)
- Euphorbia monchiquensis** Franco & P. Silva (*Quercenion broteroi*)
- Euphorbia nicaensis** All. var. **nicaensis** (*Rosmarinetalia officinalis*)
- Euphorbia oxyphylla** Boiss. in DC. (*Agrostio castellanae-Celticion giganteae*)
- Euphorbia paralias** L. (*Euphorbio paraliae-Ammophiletea arundinaceae*)
- Euphorbia pedroi** Molero & Rovira (*Asparago-Rhamnion oleoidis*)
- Euphorbia peplis** L. (*Cakiletea maritimae*)
- Euphorbia peplus** L. (*Polygono-Chenopodion polyspermi*)
- Euphorbia piscatoria** Aiton (*Mayteno umbellatae-Oleion maderensis*)
- Euphorbia portlandica** L. (*Euphorbio paraliae-Ammophiletea arundinaceae*)
- Euphorbia santamariae* (see *Euphorbia stygiana* subsp. *santamariae*)
- Euphorbia segetalis** L. (*Diplotaxion erucoidis*)
- Euphorbia stygiana** H.C. Watson subsp. **santamariae** Schäfer (*Culcito macrocarpae-Juniperenion brevifoliae*)

- Euphorbia stygiana** H.C. Watson subsp. **stygiana** (*Ericetalia azoricae*)
- Euphorbia sulcata** Lens ex Loisel. (*Brachypodium distachyi*)
- Euphorbia transtagana** Boiss. (*Quercion lusitanicae*)
- Euphorbia uliginosa** Welw ex Boiss. (*Genistion micrantho-anglicae*)
- Euphrasia azorica** Wats (*Festucion francoi*)
- Euphrasia grandiflora** Hochst. (*Festucion francoi*)
- Euphrasia hirtella** Jord. ex Reut. (*Nardetalia strictae*)
- Eurhynchium speciosum** (Brid.) Jur. (*Adiantion capilli-venereis*)
- Evax carpetana** Lange (*Evacenion carpetanae*)
- Evax lusitanica** Samp. (*Malcolmietalia*)
- Evax pygmaea** (L.) Brot. subsp. **pygmaea** (*Tuberarietea guttatae*)
- Evax pygmaea** (L.) Brot. subsp. **ramosissima** (Mariz) R. Fernandes & Nogueira (*Malcolmietalia*)
- Evax ramosissima* (see *Evax pygmaea* subsp. *ramosissima*)
- Exaculum pusillum** (Lam.) Caruel in Parl. (*Cicendion*)
- Exormotheca pustulosa** Mitt. (*Bartramio strictae-Polypodium cambrici*)
- Fagonia cretica** L. (*Pegano-Salsoletea*)
- Fallopia convolvulus** (L.) A. Löve (*Stellarienea mediae*)
- Fedia cornucopia** (L.) Gaertn. (*Cerintho-Fedion cornucopiae*)
- Fedia scorpioides** Dufresne (*Cerintho-Fedion cornucopiae*)
- Ferula communis** L. (*Brachypodietalia phoenicoidis*)
- Festuca ampla** Hack. subsp. **ampla** (*Agrostion castellanae*)
- Festuca arundinacea** Schreb. subsp. **arundinacea** (*Agrostion stoloniferae*)
- Festuca arundinacea** Schreb. subsp. **fenas** (Lag.) Arcangeli (*Molinio arundinacea-Holoschoenion vulgaris*)
- Festuca arundinacea** Schreb. subsp. **mediterranea** (Hack.) K. Richt. (*Holoschoenetalia vulgaris*)
- Festuca brigantina** (Markgr.-Dann.) Markgr.-Dann. (*Armerion eriophyllae*)
- Festuca donax** Lowe (*Sibthorpio peregrinae-Clethrion arborea*)
- Festuca durandoi** Clouston subsp. **livida** (Hack.) Rivas Ponce & Cebolla (*Agrostietalia castellanae*)
- Festuca duriotagana** Franco & Rocha Afonso (*Festucion duriotaganae*)
- Festuca elegans** Boiss. subsp. **merinoi** (Pau) Fuente & Ortúñez (*Festucion merinoi*)
- Festuca fenas* (see *Festuca arundinacea* subsp. *fenas*)
- Festuca francoi** Fern. Prieto, C. Aguiar, E. Dias & M. I. Gut. (*Festucion francoi*)
- Festuca henriquesii** Haeckel (*Campanulo herminii-Nardion strictae*)
- Festuca iberica** (Hack.) K. Richt. (*Campanulo herminii-Nardetalia strictae*)
- Festuca jubata** Lowe (*Deschampsio maderensis-Parafestucion albidae*)
- Festuca litoralis* (see *Festuca rubra* subsp. *litoralis*)
- Festuca livida* (see *Festuca durandoi* subsp. *livida*)
- Festuca mediterranea* (see *Festuca arundinacea* subsp. *mediterranea*)
- Festuca microphylla* (see *Festuca nigrescens* subsp. *microphylla*)
- Festuca multispiculata* (see *Festuca paniculata* subsp. *multispiculata*)
- Festuca nigrescens** Lam. subsp. **microphylla** (St.-Yves) Markgr.-Dann. (*Nardetalia strictae*)
- Festuca paniculata** (L.) Schinz & Thell. subsp. **multispiculata** Rivas Ponce & Cebolla (*Stipo-Agrostietea castellanae*)
- Festuca petraea** Guthnick ex Seub. (*Euphorbio azoricae-Festucion petraeae*)
- Festuca pruinosa** Hack (*Juncetea maritimi*)
- Festuca rivularis** Boiss. (*Nardetalia strictae*)
- Festuca rothmaleri** (Litard.) Maekgr.-Dann. (*Campanulo herminii-Nardion strictae*)
- Festuca rubra** L. subsp. **litoralis** (G. Mey.) Auquier (*Armerion maritimae*)
- Festuca summilusitana** Franco & Rocha Afonso subsp. **summilusitana** (*Jasiono sessiliflorae-Koelerietalia crassipedis*)
- Festuca trichophylla** (Ducros ex Gaudin) K. Richt. (*Molinietalia caeruleae*)
- Ficus carica** L. (*Parietarietalia*)
- Filago lutescens** Jord. (*Tuberarietalia guttatae*)
- Filago pyramidata** L. (*Stellarietea mediae*)
- Filipendula ulmaria** (L.) Maxim. (*Filipendulion ulmariae*)
- Filipendula vulgaris** Moench (*Festuco-Brometea*)
- Fimbristylis bisumbellata** (Forssk.) Bubani (*Verbenion supinae*)
- Flueggea tinctoria** (L.) G.L. Webster (*Flueggeion tinctoriae*)
- Foeniculum piperitum* (see *Foeniculum vulgare* subsp. *piperitum*)
- Foeniculum vulgare** Miller subsp. **piperitum** (Ucria) Cout. (*Carthametalia lanati*)
- Foeniculum vulgare** Miller subsp. **vulgare** (*Artemisietalia vulgaris*)
- Fontinha, Jardim & Sequeira (*Ranunculo cortusifolii-Geranion canariensis*)
- Fragaria vesca** L. (*Epilobietea angustifoliae*)
- Frangula alnus** Mill. subsp. **alnus** (*Salici purpureae-Populetea nigrae*)
- Frangula azorica** Grubov (*Dryopterido azoricae-Laurion azoricae*)
- Frankenia boissieri** Reut. ex Boiss. (*Juncenion maritimi*)
- Frankenia hebecaulon* (see *Frankenia laevis* var. *hebecaulon*)
- Frankenia laevis** L. var. **hebecaulon** Lowe (*Helichryson obconico-devium*)
- Frankenia laevis** L. var. **laevis** (*Limonio ovalifolii-Frankenion laevis*)
- Frankenia pulverulenta** L. (*Frankenietalia pulverulenta*)
- Fraxinus angustifolia** Vahl subsp. **angustifolia** (*Fraxino angustifoliae-Ulmenion minoris*)
- Fritillaria lusitanica** Wikström subsp. **stenophylla** (Boiss. & Reuter) Cout. (*Coremation albidae*)
- Frullania tamarisci** (L.) Dumort. (*Anomodonto-Polypodieta-lia*)
- Fumana ericoides** (Cav.) Gand subsp. **ericoides** (*Rosmarinetea officinalis*)
- Fumana laevipes** (L.) Spach (*Rosmarinetales officinalis*)
- Fumana procumbens** Dunal subsp. **procumbens** (*Rosmarinetea officinalis*)
- Fumana thymifolia** (L.) Spach ex Webb (*Rosmarinetales officinalis*)
- Fumaria agraria** Lag. (*Fumarion wirtgenii-agrariae*)
- Fumaria bastardii** Bor. (*Solano nigri-Polygonetalia convolvuli*)
- Fumaria capreolata** L. (*Cardamino hirsutae-Geranietea purpurei*)
- Fumaria densiflora** DC. (*Solano nigri-Polygonetalia convolvuli*)
- Fumaria laeta* (see *Fumaria muralis* var. *laeta*)
- Fumaria lowei* (see *Fumaria muralis* var. *lowei*)
- Fumaria muralis** Slonder ex Koch var. **laeta** Lowe (*Vicio costei-Echietum plantaginei*)
- Fumaria muralis** Slonder ex Koch var. **lowei** Pugsley (*Galinsogo quadriradiatae-Fumarium lowei*)
- Fumaria muralis** Sonder ex Koch var. **muralis** (*Stellarienea mediae*)
- Fumaria officinalis** L. (*Polygono-Chenopodion polyspermi*)
- Fumaria parviflora** Lam. (*Fumarion wirtgenii-agrariae*)
- Fumaria vaillantii** Loisel in Desv. (*Polygono-Chenopodion polyspermi*)
- Fumaria wirtgenii** Koch (*Fumarion wirtgenii-agrariae*)
- Gagea lusitanica** A. Terracc. (*Poetalia bulbosae*)
- Gagea pratensis** (Pers.) Dumort. (*Festuco-Brometea*)
- Gagea soleirolii** F.W. Schultz (*Nardetea strictae*)
- Galactites tomentosa** Moench (*Echio plantaginei-Galactition tomentosae*)

- Galeopsis tetrahit** L. (*Stellarienea mediae*)
- Galinsoga ciliata** (Rafin.) Blake (*Polygono-Chenopodion polyspermi*)
- Galinsoga parviflora** Cav. (*Polygono-Chenopodion polyspermi*)
- Galinsoga quadriradiata** Ruiz & Pavón (*Polygono-Chenopodion polyspermi*)
- Galium album** Mill. (*Arrhenatherion elatioris*)
- Galium aparine** L. (*Galio-Urticetea*)
- Galium belizianum** Ortega Oliv., Deveza & T. Rodr. (*Quercenion robori-pyrenaicae*)
- Galium broterianum** Boiss. (*Caricion reuterianae*)
- Galium concatenatum** Cosson (*Brachypodion phoenicoidis*)
- Galium debile** Desv. (*Brizo-Holoschoenenion*)
- Galium divaricatum** Pourr. ex Lam. (*Tuberarion guttatae*)
- Galium elongatum** C. Presl. (*Magno-Caricetalia*)
- Galium lucidum** All. (*Brachypodietalia phoenicoidis*)
- Galium minutulum** Jord. (*Parietarion lusitanico-mauritanicae*)
- Galium murale** (L.) All. (*Geranio pusilli-Anthriscion caucalidis*)
- Galium palustre** L. (*Magno-Caricetalia*)
- Galium parisiense** L. (*Tuberarietea guttatae*)
- Galium productum** Lowe (*Sinapidendro angustifolii-Aeonion glutinosi*)
- Galium rivulare** Boiss. & Reut. (*Juncion acutiflori*)
- Galium rotundifolium** L. (*Fagetalia sylvaticae*)
- Galium saxatile** L. subsp. **saxatile** (*Nardetalia strictae*)
- Galium saxatile** L. subsp. **vivianum** (Kliphuis) Ehrhend. (*Nardetalia strictae*)
- Galium spurium** L. (*Cardaminetea hirsutae*)
- Galium tricorutum** Dandy (*Centaureetalia cyani*)
- Galium verrucosum** Hudson (*Roemerion hybridae*)
- Galium verum** L. var. **verum** (*Festuco-Brometea*)
- Galium vivianum* (see *Galium saxatile* subsp. *vivianum*)
- Gastridium phleoides** (Ness & Meyen) C.E. Hubb. (*Thero-Brometalia*)
- Gastridium ventricosum** (Gouan.) Schinz & Thell. (*Echio plantaginei-Galactition tomentosae*)
- Gaudinia coerctata** (Link) Dur. & Schinz (*Ornithopo pinnaetae-Gaudinion coerctatae*)
- Gaudinia fragilis** (L.) P. Beauv. var. **fragilis** P. Beauv. (*Stipo-Agrostietea castellanae*)
- Gaudinia fragilis** (L.) P. Beauv. var. **verticicola** Rivas Mart. A. Galán (*Gaudinio verticolae-Hordeion bulbosae*)
- Gaudinia verticicola* (see *Gaudinia fragilis* var. *verticicola*)
- Genista algarbiensis* (see *Genista hirsuta* subsp. *algarbiensis*)
- Genista ancistrocarpa** Spach (*Genistion micrantho-anglicae*)
- Genista anglica** L. (*Genistion micrantho-anglicae*)
- Genista berberidea** Lange (*Genistion micrantho-anglicae*)
- Genista cinerascens** Lange (*Genistion floridae*)
- Genista falcata** Brot. (*Quercion pyrenaicae*)
- Genista florida** L. subsp. **florida** (*Genistion floridae*)
- Genista florida** L. subsp. **polygaliphylla** (Brot.) Cout. (*Cytisium multiflori*)
- Genista hirsuta** Vahl. subsp. **algarbiensis** (Cout.) Rivas Mart., T.E. Díaz & Fern. Gonz. (*Saturejo-Thymbrion capitatae*)
- Genista hirsuta** Vahl. subsp. **hirsuta** (*Ulici argentei-Cistion ladaniferi*)
- Genista hystrix** Lange (*Cytisetalia scopario-striati*)
- Genista micrantha** Ortega (*Genistion micrantho-anglicae*)
- Genista polyanthos** R. Roem. ex Willk. (*Retamion sphaerocarphae*)
- Genista polygaliphylla* (see *Genista florida* subsp. *polygaliphylla*)
- Genista scorpius** (L.) DC. (*Rosmarinetalia officinalis*)
- Genista tenera** (Jacq. ex Murr.) Kuntze (*Soncho ustulati-Artemision argenteae*)
- Genista tournefortii** Spach (*Quercion broteroi*)
- Genista triacanthos** Brot (*Ericion umbellatae*)
- Gennaria diphylla** (Link) Parl. (*Quercu rotundifoliae-Oleion sylvestris*)
- Gentiana lutea** L. subsp. **aurantiaca** M. Lainz (*Campanulo herminii-Nardion strictae*)
- Gentiana pneumonanthe** L. subsp. **pneumonanthe** (*Nardetalia strictae*)
- Geranium columbinum** L. (*Geranio pusilli-Anthriscion caucalidis*)
- Geranium dissectum** L. (*Cardaminetea hirsutae*)
- Geranium lucidum** L. (*Geranio pusilli-Anthriscion caucalidis*)
- Geranium lusitanicum* (see *Geranium pyrenaicum* subsp. *lusitanicum*)
- Geranium molle** L. (*Sisymbrietalia officinalis*)
- Geranium palmatum** Cav. (*Ranunculo cortusifolii-Geranium canariensis*)
- Geranium purpureum** Vill. (*Cardamino hirsutae-Geranietea purpurei*)
- Geranium pusillum** L. (*Geranio pusilli-Anthriscion caucalidis*)
- Geranium pyrenaicum** Burm. f. subsp. **lusitanicum** (Samp.) S. Ortiz (*Arction lappae*)
- Geranium pyrenaicum** Burm. f. subsp. **pyrenaicum** (*Arction lappae*)
- Geranium robertianum** L. (*Galio-Alliarion petiolatae*)
- Geranium rotundifolium** L. (*Cardaminetea hirsutae*)
- Geranium rubescens** Yao (*Galio-Alliarion petiolatae*)
- Geranium sanguineum** L. (*Origanetalia vulgaris*)
- Geum urbanum** L. (*Galio aparines-Alliarietalia petiolatae*)
- Gladiolus illyricus** Koch (*Brachypodietalia phoenicoidis*)
- Gladiolus italicus** Mill. (*Lygeo-Stipetea*)
- Glaucium corniculatum** (L.) J.H. Rudolph Crantz (*Stellarienea mediae*)
- Glaucium flavum** Crantz (*Cakiletea maritimae*)
- Glaux maritima** L. (*Juncetea maritimi*)
- Glechoma hederacea** L. (*Galio aparines-Alliarietalia petiolatae*)
- Glinus lotoides** L. (*Verbenion supinae*)
- Globularia alypum** L. (*Rosmarinetea officinalis*)
- Globularia salicina** Lam. (*Rhamno crenulatae-Oleetalia cerasiformis*)
- Globularia vulgaris** L. (*Rosmarinetalia officinalis*)
- Glossopappus macrotus** (Durieu) Briq. (*Cerintho majoris-Fedion cornucopiae*)
- Glyceria declinata** Bréb. (*Glycerienion fluitantis*)
- Glyceria fluitans** (L.) R.Br. (*Magno-Carici elatae-Phragmitetea australis*)
- Glyceria spicata** (Viv.) Guss. (*Glycerienion fluitantis*)
- Glycyrrhiza glabra** L. (*Populion albae*)
- Gnaphalium luteo-album* (see *Pseudognaphalium luteo-album*)
- Gnaphalium uliginosum** L. (*Nano-Cyperetalia*)
- Goodyera macrophylla** Lowe (*Sibthorpio peregrinae-Clethrion arboreae*)
- Grammitis marginella** (Sw.) Sw. subsp. **azorica** (*Ericetalia azoricae*)
- Gratiola linifolia** Vahl. (*Magno-Carici elatae-Phragmitetea australis*)
- Gratiola officinalis** L. (*Magno-Caricion elatae*)
- Groenlandia densa** (L.) Fourr. (*Ranunculion fluitantis*)
- Gymnadenia conopsea** (L.) R.Br. (*Molinietalia caeruleae*)
- Gymnoclea inflata** (Huds.) Dumort. (*Erico tetralicis-Sphagnetalia papilloso*)
- Gymnostomum calcareum** Nees & Hornsch (*Adiantetalia capilli-veneris*)
- Gymnostyles stolonifera** (Brot.) Tutin (*Polygono-Poetea annuae*)
- Gynandris sisyrrinchium** (L.) Parl. (*Poetea bulbosae*)
- Hainardia cylindrica** (Willd.) Greuter (*Hordeion marini*)
- Halimione portulacoides** (L.) Aellen (*Sarcocornietalia fruticosae*)

- Halimium alyssoides** (Lam.) C. Koch (*Calluno-Ulicetea*)
Halimium calycinum (L.) K. Koch (*Coremation albi*)
Halimium halimifolium (L.) Willk. subsp. **halimifolium** (*Coremation albi*)
Halimium halimifolium (L.) Willk. subsp. **multiflorum** (Dunal) Maire (*Coremation albi*)
Halimium lasianthum (Lam.) Spach (*Stauracanthion boivinii*)
Halimium multiflorum (see *Halimium halimifolium* subsp. **multiflorum**)
Halimium ocymoides (Lam.) Willk. (*Ericion umbellatae*)
Halimium umbellatum (L.) Spach (*Calluno-Ulicetea*)
Halimium verticillatum (Brot.) Senn. (*Coremation albi*)
Halimium viscosum (Willk.) P. Silva (*Cisto-Lavanduletea*)
Haloepelis amplexicaulis (Vahl) Ung.-Stenb. (*Thero-Salicornietalia*)
Heberdenia excelsa (Aiton) Banks ex DC. (*Pruno hixae-Laurretalia novocanariensis*)
Hedera azorica (Gand.) Fern. Prieto, C. Aguiar, Dias & Nava (*Ericetalia azoricae*)
Hedera hibernica Bean (*Quercetalia roboris*)
Hedera iberica (see *Hedera maderensis* subsp. *iberica*)
Hedera maderensis K. Koch subsp. **iberica** Mc Allister (*Arbuto unedonis-Laurion nobilis*)
Hedera maderensis K. Koch subsp. **maderensis** (*Sibthorpio peregrinae-Clethrion arboreae*)
Hedychium gardnerianum Sheppard ex Ker Gawl (*Myrico jayae-Pittosporion undulati*)
Hedypnois arenaria (Schousb.) DC. (*Linarion pedunculatae*)
Hedypnois cretica (L.) Dumont-Courset (*Thero-Brometalia*)
Hedysarum coronarium L. (*Cerintho-Fedion cornucopiae*)
Hedysarum glomeratum F. Dietr. (*Cerintho-Fedion cornucopiae*)
Helianthemum aegyptiacum (L.) Mill. (*Tuberarietalia guttatae*)
Helianthemum apenninum (L.) Mill. subsp. **apenninum** (*Rosmarinetalia officinalis*)
Helianthemum apenninum (L.) Mill. subsp. **rothmaleri** (Rothm) Mayor & Fdez Benito (*Jasiono sessiliflorae-Koelerietalia crassipedis*)
Helianthemum bethuricum (see *Helianthemum hirtum* subsp. *bethuricum*)
Helianthemum cinereum (Cav.) Pers. subsp. **rotundifolium** (Dunal) Greuter & Burdet. (*Rosmarinetalia officinalis*)
Helianthemum croceum (Desf.) Pers. subsp. **stoechadifolium** (Brot.) M.B. Crespo & Fabregat (*Rosmarinetalia officinalis*)
Helianthemum hirtum (L.) Mill. subsp. **bethuricum** Rivas Goday ex Rivas Mart., T.E. Díaz & Fern. Gonz. (*Saturejo-Thymbrion capitatae*)
Helianthemum ledifolium (L.) Mill. (*Tuberarietalia guttatae*)
Helianthemum marifolium (L.) Mill. (*Rosmarinetalia officinalis*)
Helianthemum origanifolium (Lam.) Pers. (*Saturejo-Thymbrion capitatae*)
Helianthemum rothmaleri (see *Helianthemum apenninum* subsp. *rothmaleri*)
Helianthemum rotundifolium (see *Helianthemum cinereum* subsp. *rotundifolium*)
Helianthemum salicifolium (L.) Mill. (*Tuberarietalia guttatae*)
Helianthemum sanguineum (Lag.) Lag. (*Tuberarion guttatae*)
Helianthemum stoechadifolium (see *Helianthemum croceum* subsp. *stoechadifolium*)
Helianthemum violaceum (Cav.) Pers. (*Rosmarinetea officinalis*)
Helichrysum decumbens Cambess. (*Crithmo-Daucion halophili*)
Helichrysum devium J. Y. Johnson (*Helichryson obconico-devium*)
Helichrysum italicum (L.) Moench subsp. **serotinum** (Boiss.) (*Helichryso stoechadis-Santolinetalia squarrosae*)
Helichrysum melaleucum Rchb. ex Holl (*Mayteno umbellatae-Oleion maderensis*)
Helichrysum monizii Lowe (*Soncho ustulati-Artemision argenteae*)
Helichrysum obconicum DC. (*Helichryson obconico-devium*)
Helichrysum picardii Boiss. & Reut. (*Helichryson picardii*)
Helichrysum stoechas (L.) Moench subsp. **stoechas** (*Helichryso stoechadis-Santolinetalia squarrosae*)
Helictotrichon hackelii (Henriq.) Henrard subsp. **hackelii** (*Agrostio castellanae-Celticion giganteae*)
Helictotrichon hackelii (Henriq.) Henrard subsp. **stenophylla** Franco (*Agrostio castellanae-Celticion giganteae*)
Heliotropium europaeum L. (*Diplotaxion erucoidis*)
Heliotropium supinum L. (*Verbenion supinae*)
Helleborus foetidus L. (*Quercu-Fagetea*)
Heracleum sphondylium L. subsp. **sphondylium** (*Arrhenatherion elatioris*)
Herniaria algarvica Chaudri (*Linarion pedunculatae*)
Herniaria ciliolata Melderis subsp. **robusta** Chaudri (*Corynephorion maritimi*)
Herniaria cinerea DC. (*Tuberarietalia guttatae*)
Herniaria glabra L. (*Poetalia bulbosae*)
Herniaria maritima Link (*Corynephorion maritimi*)
Herniaria robusta (see *Herniaria ciliolata* subsp. *robusta*)
Herniaria scabrida Boiss. var. **scabrida** (*Jasiono sessiliflorae-Koelerietalia crassipedis*)
Herniaria scabrida Boiss. var. **unamunoana** (Sennen) Chaudri (*Corynephorion maritimi*)
Herniaria unamunoana (see *Herniaria scabrida* var. *unamunoana*)
Hieracium amplexicaule L. (*Asplenietea trichomanis*)
Hieracium castellanum Boiss. & Reut. (*Jasiono sessiliflorae-Koelerietalia crassipedis*)
Hieracium lachenalii C. C. Gmelin (*Quercetalia roboris*)
Hieracium laevigatum Willd. (*Quercetalia roboris*)
Hieracium maculatum Sm. (*Quercetalia roboris*)
Hieracium murorum L. (*Quercu-Fagetea*)
Hieracium myriadenum Bois. & Reuter (*Festucetalia curvifoliae*)
Hieracium peleteranum Mérat. (*Brachypodion phoenicoidis*)
Hieracium pilosella L. subsp. **tricholepium** Naegeli & Peter (*Campanulo herminii-Nardenalia*)
Hieracium sabaudum L. (*Quercetalia roboris*)
Hieracium schmidtii Tausch (*Androsacetalia vandellii*)
Hieracium tricholepium (see *Hieracium pilosella* subsp. *tricholepium*)
Hieracium umbellatum L. (*Quercetalia roboris*)
Hieracium vahlii Fröelich in DC. (*Festucetalia curvifoliae*)
Hieracium virescens Koch (*Linarion triornithophorae*)
Hieracium vulgatum Fries (*Linarion triornithophorae*)
Hippocrepis biflora Sprengel (*Brachypodietalia distachyi*)
Hippocrepis ciliata Willd. (*Tuberarietalia guttatae*)
Hippocrepis multisiliquosa L. (*Tuberarietalia guttatae*)
Hippuris vulgaris L. (*Potametalia*)
Hirschfeldia incana (L.) Lagr.-Foss. (*Hordeion leporini*)
Hispidella hispanica (Lam.) Barnades (*Molineriellion laevis*)
Holcus annuus Salzm. ex C.A. Mey subsp. **annuus** (*Agrostion castellanae*)
Holcus annuus Salzm. ex C.A. Mey subsp. **duriensis** (P. Silva) Franco & Rocha Afonso (*Molineriellion laevis*)
Holcus duriensis (see *Holcus annuus* subsp. *duriensis*)
Holcus gyanus Boiss. (*Molineriellion laevis*)
Holcus lanatus L. (*Molinio-Arrhenatheretea*)
Holcus mollis L. (*Quercetalia roboris*)
Holcus reuteri Boiss. in Boiss. & Reut. (*Caricion reuterianae*)
Holcus rigidus Hochst (*Tolpido azoricae-Holcetea rigidi*)
Holoschoenus romanus subsp. **australis** (see *Scirpoides holoschoenus* subsp. *australis*)
Holoschoenus romanus subsp. *holoschoenus* (see *Scirpoides holoschoenus* subsp. *holoschoenus*)
Holosteum umbellatum L. subsp. **umbellatum** (*Stellarietalia mediae*)

- Homalia lusitanica** Schimp. (*Adiantion capilli-veneris*)
Homalothecium sericeum (Hedwg.) Schimp. (*Anomodonto-Polypodietales*)
Honckenya peploides (L.) Ehrh (*Elytrigienion boreoatlanticae*)
Hordeum bulbosum L. (*Gaudinio verticolae-Hordeion bulbosae*)
Hordeum leporinum (see *Hordeum murinum* subsp. *leporinum*)
Hordeum marinum Huds. (*Hordeion marini*)
Hordeum murinum L. subsp. **leporinum** (Link) Arcang. (*Hordeion leporini*)
Hordeum murinum L. subsp. **murinum** (*Sisymbrium officinalis*)
Hornungia petraea (L.) Rchb. (*Brachypodium distachyi*)
Humulus lupulus L. (*Salici purpureae-Populetea nigrae*)
Huperzia dentata (Harter) Holub (*Daboecion azoricae*)
Huperzia suberecta (Lowe) Tardieu (*Daboecion azoricae*)
Hyacinthoides hispanica (Mill.) Rothm. (*Quercion broteroi*)
Hyacinthoides non-scripta (L.) Chouard ex Rothm. (*Quercio-Fagetea*)
Hyacinthoides transtagana (see *Hyacinthoides vicentina* subsp. *transtagana*)
Hyacinthoides vicentina (Hoffmanns & Link) Rothm. subsp. *transtagana* Franco & Rocha Afonso (*Trifolio fragiferi-Cynodontion dactyli*)
Hyacinthoides vicentina (Hoffmanns & Link) Rothm. subsp. *vicentina* (*Eryngio-Ulicenion erinacei*)
Hydrocotyle vulgaris L. (*Littorelletalia*)
Hygrohypnum luridum (Hedw.) Jenn. (*Montio-Cardaminetalia*)
Hymenocarpos cornicina (Desf.) Viv. (*Tuberarion guttatae*)
Hymenocarpos hamosus (Desf.) Vis. (*Malcolmietales*)
Hymenocarpos lotoides (L.) Vis. (*Tuberarietalia guttatae*)
Hymenolobus procumbens (L.) Nutt. (*Frankenion pulverulentae*)
Hymenophyllum maderense Gibby & Lovis (*Hymenophyllion tunbrigensis*)
Hymenophyllum tunbrigense (L.) Sm. (*Hymenophyllion tunbrigensis*)
Hymenophyllum wilsonii Hooker (*Hymenophyllion tunbrigensis*)
Hymenostylium recurvirostrum (Hedw.) Dixon (*Adiantion capilli-veneris*)
Hyoscyamus albus L. (*Parietarietalia*)
Hyoscyamus niger L. (*Onopordenea acanthii*)
Hyparrhenia hirta (L.) Stapf in Prain (*Hyparrhenion sinaicae*)
Hyparrhenia sinaica (Delile) Llauro ex G. López (*Hyparrhenion sinaicae*)
Hypocoum imberbe Sm. L. (*Centaureetalia cyani*)
Hypocoum littorale Wulfen (*Linarion pedunculatae*)
Hypocoum procumbens L. (*Roemerion hybridae*)
Hypericum androsaemum L. (*Pulmonario longifoliae-Quercion roboris*)
Hypericum canariense L. var. **floribundum** (Aiton) Bornm. (*Rhamno crenulatae-Oleetalia cerasiformis*)
Hypericum elodes L. (*Eleocharition multicaulis*)
Hypericum floribundum (see *Hypericum canariense* var. *floribundum*)
Hypericum foliosum Aiton (*Ericetalia azoricae*)
Hypericum glandulosum (L.) Webb & Berthel. (*Pruno hixae-Lauretea novocanariensis*)
Hypericum grandifolium Choisy (*Pruno hixae-Lauretea novocanariensis*)
Hypericum humifusum L. (*Isoeto-Nano-Juncetea*)
Hypericum montanum L. (*Quercetalia pubescenti-petraeae*)
Hypericum perforatum L. (*Brachypodietales phoenicoidis*)
Hypericum perforatum L. (*Brachypodietales phoenicoidis*)
Hypericum pubescens Boiss. (*Holoschoenetalia vulgaris*)
Hypericum pulchrum L. (*Quercetalia roboris*)
Hypericum tomentosum L. (*Molinio arundinacea-Holoschoenion vulgaris*)
Hypericum undulatum Schousb. ex Willd. (*Juncion acutiflori*)
Hypericum x inodorum Mill. (*Parietario-Galion muralis*)
Hypochaeris glabra L. (*Tuberarion guttatae*)
Hypochaeris radicata L. subsp. **radicata** (*Plantaginetales majoris*)
Iberis microcarpa (Franco & P.Silva) Rivas Mart. (*Ulici densi-Thymion sylvestris*)
Iberis procumbens Lange (*Helichryson picardii*)
Iberis welwitschii Boiss. (*Coremation albi*)
Ilex aquifolium L. (*Quercio-Fagetea*)
Ilex azorica Loes (*Dryopterido azoricae-Laurion azoricae*)
Ilex canariensis Poir. (*Pruno hixae-Lauretea novocanariensis*)
Ilex perado Aiton (*Sibthorpio peregrinae-Clethrion arborea*)
Illecebrum verticillatum L. (*Cicendion*)
Imperata cylindrica (L.) Raesch. (*Nerio-Tamaricetea*)
Inula conyza DC. (*Trifolio medii-Geranietea sanguinei*)
Inula crithmoides L. (*Sarcocornietea fruticosae*)
Inula montana L. (dif. *Festuco-Brometea*)
Inula salicina L. (*Trifolio medii-Geranietea sanguinei*)
Ipomaea acuminata (Vahl) Roem. & Schultes (*Ageratinio adenophorae-Ipomaeion acuminatae*)
Iris boissieri Henriq. (*Carici piluliferae-Epilobion angustifolii*)
Iris foetidissima L. (*Populion albae*)
Iris pseudacorus L. (*Phragmitetalia*)
Iris subbiflora Brot. (*Teucrio pseudochamaepityos-Brachypodium retusi*)
Isoetes azorica Durieu ex Milde (*Littorellion uniflorae*)
Isoetes duriaei Bory (*Isoetion*)
Isoetes histrix Bory (*Isoetion*)
Isoetes setaceum Lam. (*Menthion cervinae*)
Isoetes velatum A. Braun in Bory & Durieu subsp. **velatum** (*Menthion cervinae*)
Isolepis cernua (Vahl) Roem. & Schult. (*Nano-Cyperion*)
Isolepis pseudosetacea (Duveau) Vasc. (*Cicendion*)
Isolepis setacea (L.) R.Br. (*Nano-Cyperion*)
Isolepis scepterum (L.f.) Loud. (*Euphorbion melliferae*)
Jasione blepharodon Boiss & Reut. (*Brachypodium distachyi*)
Jasione carpetana (see *Jasione laevis* subsp. *carpetana*)
Jasione centralis (see *Jasione crispa* subsp. *centralis*)
Jasione crispa (Pourr.) Samp. subsp. **centralis** (Rivas Mart.) Tutin (*Festucetalia curvifoliae*)
Jasione gracilis (see *Jasione montana* subsp. *gracilis*)
Jasione laevis Lam. subsp. **carpetana** (Boiss. & Reut.) Rivas Mart. (*Campanulo herminii-Nardion strictae*)
Jasione lusitanica A. DC. (*Helichryson picardii*)
Jasione mariana Willk. (*Cheilanthon hispanicae*)
Jasione montana L. subsp. **gracilis** (Lange) Rivas Mart. (*Tuberarietalia guttatae*)
Jasione montana L. subsp. **montana** (*Tuberarion guttatae*)
Jasione serpentinicola (see *Jasione sessiliflora* subsp. *serpentinicola*)
Jasione sessiliflora Boiss. & Reut. subsp. **serpentinicola** (P. Silva) Rivas Mart. & Sánchez Mata (*Armerion eriophyllae*)
Jasione sessiliflora Boiss. & Reut. subsp. **sessiliflora** (*Jasione sessiliflorae-Koelerietalia crassipedis*)
Jasminum azoricum L. (*Mayteno umbellatae-Oleion maderensis*)
Jasminum fruticans L. (*Pistacio lentisci-Rhamnetalia alaterni*)
Jasminum odoratissimum L. (*Rhamno crenulatae-Oleetalia cerasiformis*)
Jasonia tuberosa (L.) DC. (*Holoschoenetalia vulgaris*)
Jonopsidium acaule (Desf.) Rchb. (*Tuberarietea guttatae*)
Jonopsidium abulense (Pau) Rothmaler (*Jonopsidio abulensis-Sedetum maireani*)
Juncus acutiflorus Ehrh. ex Hoffmanns. subsp. **acutiflorus** (*Molinietales caeruleae*)

- Juncus acutiflorus** Ehrh. ex Hoffmanns. subsp. **rugosus** (Steudel) Cout. (*Juncus acutiflori*)
Juncus acutus L. (*Juncetalia maritimi*)
Juncus ambiguus Guss. (*Isoeto-Nano-Juncetea*)
Juncus articulatus L. (*Molinetalia caeruleae*)
Juncus bufonius L. (*Isoeto-Nano-Juncetea*)
Juncus bulbosus L. (*Littorelletalia*)
Juncus capitatus Weigel (*Isoetalia*)
Juncus compressus Jacq. (*Plantaginietalia majoris*)
Juncus conglomeratus L. (*Molinetalia caeruleae*)
Juncus effusus L. (*Molinetalia caeruleae*)
Juncus emmanuelis A. Fernandes & Garcia (*Eleocharition multicaulis*)
Juncus fontanesii Gay (*Molinetalia caeruleae*)
Juncus heterophyllus Dufour (*Eleocharition multicaulis*)
Juncus hybridus Brot. (*Isoetalia*)
Juncus inflexus L. (*Potentillo anserinae*)
Juncus maritimus Lam. (*Juncetea maritimi*)
Juncus perpusillus (see *Juncus tenageia* subsp. *perpusillus*)
Juncus pygmaeus Rich. (*Isoetalia*)
Juncus rugosus (see *Juncus acutiflorus* subsp. *rugosus*)
Juncus sphaerocarpus Nees (*Isoeto-Nano-Juncetea*)
Juncus squarrosus L. (*Nardetalia strictae*)
Juncus subnodulosus Schrank. (*Molinetalia caeruleae*)
Juncus subulatus Forssk. (*Juncion maritimi*)
Juncus tenageia L.f. subsp. **tenageia** (*Isoeto-Nano-Juncetea*)
Juncus tenageia L.f. subsp. **perpusillus** Fern-Cav. & F. Navarro (*Menthion cervinae*)
Juncus tenuis Willd. (*Lolio perennis-Plantaginion majoris*)
Juncus valvatus Link. (*Juncion acutiflori*)
Juniperus alpina (see *Juniperus communis* subsp. *alpina*)
Juniperus badia (see *Juniperus oxycedrus* subsp. *lagunae*)
Juniperus brevifolia (Seub.) Antoine (*Lauro azoricae-Juniperetea brevifoliae*)
Juniperus canariensis (see *Juniperus turbinata* subsp. *canariensis*)
Juniperus cedrus Webb & Berthel. subsp. **maderensis** (Menezes) Rivas Mart., Capelo, J.C. Costa, Lousã, Fontinha, Jardim & Sequeira (*Polysticho falcinelli-Ericion canariensis*)
Juniperus communis L. subsp. **alpina** (Suter) Celakn (*Cytision oromediterranei*)
Juniperus communis L. subsp. **hemisphaerica** (C. Presl) Nyman (*Juniperetalia hemisphaericae*)
Juniperus communis subsp. *nana* (see *Juniperus communis* subsp. *alpina*)
Juniperus lagunae (see *Juniperus oxycedrus* subsp. *lagunae*)
Juniperus maderensis (see *Juniperus cedrus* subsp. *maderensis*)
Juniperus navicularis Gand (*Juniperion turbinatae*)
Juniperus oxycedrus L. subsp. **lagunae** (Pau ex Vicioso) Rivas Mart. (*Quercetalia ilicis*)
Juniperus oxycedrus L. subsp. **oxycedrus** (*Pistacio lentiscii-Rhamnetalia alatarni*)
Juniperus oxycedrus subsp. *badia* (see *Juniperus oxycedrus* subsp. *lagunae*)
Juniperus turbinata Guss. subsp. **canariensis** (Guyot in Mathou & Guyot) Rivas Mart., Wildpret & P. Pérez (*Rhamno crenulatae-Oleetalia cerasiformis*)
Juniperus turbinata Guss. subsp. **turbinata** (*Pistacio lentiscii-Rhamnetalia alatarni*)
Jurinea humilis (Desf.) DC. (*Festucetea indigestae*)
Kickxia cirrhosa (L.) Frisch (*Cicendion*)
Kickxia elatine (L.) Dumort. (*Centaureetalia cyani*)
Kickxia integrifolia (see *Kickxia spuria* subsp. *integrifolia*)
Kickxia lanigera (Desf.) Hand.-Mazz. (*Diploctaxon erucoidis*)
Kickxia spuria (L.) Dumort. subsp. **integrifolia** (Brot.) R. Fern. (*Centaureetalia cyani*)
Knautia arvensis (L.) Coulter (*Molinio-Arrhenatheretea*)
Koeleria caudata (Link) Steudel subsp. **crassipes** (Lange) Rivas Mart. (*Festucetea indigestae*)
Koeleria vallesiana (Honk.) Gaudin (*Rosmarinetea officinalis*)
Kundmannia sicula (L.) DC. (*Smyrniunion olusatri*)
Lactuca chondrilliflora Boreau (*Andryaetalia ragusinae*)
Lactuca saligna L. (*Trifolio fragiferi-Cynodontion*)
Lactuca serriola L. (*Artemisietea vulgaris*)
Lactuca viminea (L.) J. & C. Presl. (*Andryaetalia ragusinae*)
Lactuca virosa L. (*Onopordetalia acanthii*)
Lactuca watsoniana Trelease (*Pericallion malvifoliae*)
Lagurus ovatus L. (*Linario polygalifoliae-Vulpion alopecuroidis*)
Lamarckia aurea (L.) Moench (*Chenopodietalia muralis*)
Lamium amplexicaule L. (*Stellarienea mediae*)
Lamium flexuosum Ten. (*Populetalia albae*)
Lamium hybridum Vill. (*Polygono-Chenopodion polyspermi*)
Lamium maculatum L. (*Galio-Urticetea*)
Lamium purpureum L. (*Stellarienea mediae*)
Lamprothamnium papulosum (Wallr.) J. Groves (*Charion canescens*)
Lantana camara L. (*Ageratinio adenophorae-Ipomaeion acuminatae*)
Lapsana communis L. (*Galio aparines-Alliarietalia petiolatae*)
Laserpitium prutenicum L. subsp. **doufourianum** (Rouy & E. G. Camus) Braun-Blanquet (*Daboecion cantabricae*)
Laserpitium thalictrifolium Samp. (*Quercion pyrenaicae*)
Lathyrus angulatus L. (*Tuberarion guttatae*)
Lathyrus aphaca L. (*Stellarienea mediae*)
Lathyrus cicera L. (*Stellarienea mediae*)
Lathyrus clymenum L. (*Hyparrhenion sinaicae*)
Lathyrus latifolius L. (*Trifolio medii-Geranietea sanguinei*)
Lathyrus linifolius (Reichard) Bässler (*Quercetalia roboris*)
Lathyrus niger (L.) Bernh. (*Quercetalia pubescenti-petraeae*)
Lathyrus ochrus (L.) DC. in Lam. & DC. (*Roemerion hybridae*)
Lathyrus pratensis L. (*Molinio-Arrhenatheretea*)
Lathyrus setifolius L. (*Tuberarietea guttatae*)
Lathyrus sphaericus Retz. (*Tuberarietalia guttatae*)
Lathyrus sylvestris L. (*Trifolio medii-Geranietea sanguinei*)
Launaea arborescens (Batt.) Murb. (*Pegano-Salsoletea*)
Laurus azorica (Seub.) Franco (*Frangula azoricae-Lauretalia azoricae*)
Laurus nobilis L. (*Arbutio unedonis-Laurion nobilis*)
Laurus novocanariensis Rivas Mart., Lousã, Fern. Prieto, E. Dias, J.C. Costa & C. Aguiar (*Pruno hixae-Lauretalia novocanariensis*)
Lavandula latifolia Medik. (*Rosmarinetalia officinalis*)
Lavandula luisieri (Rozeira) Rivas Mart. (*Ulici argentei-Cistion ladaniferi*)
Lavandula lusitanica (see *Lavandula sampaiiana* subsp. *lusitanica*)
Lavandula multifida L. (*Lygeo-Stipetea*)
Lavandula pedunculata (Mill.) Cav. (*Cistion laurifolii*)
Lavandula pinnata L.f. (*Forsskaoleo angustifoliae-Rumicetalia lunariae*)
Lavandula sampaiiana (Rozeira) Rivas Mart., T.E. Díaz & Fern. Gonz. subsp. **lusitanica** (Chatyor) Rivas Mart., T.E. Díaz & Fern. Gonz. (*Coremation albi*)
Lavandula sampaiiana (Rozeira) Rivas Mart., T.E. Díaz & Fern. Gonz. subsp. **sampaiiana** (*Ulici argentei-Cistion ladaniferi*)
Lavandula viridis L'Hér. (*Ericion umbellatae*)
Lavatera arborea L. (*Brassico oleraceae-Lavateretalia arborea*)
Lavatera cretica L. (*Malvenion parviflorae*)
Lavatera maritima Gouan (*Parietarietalia*)
Lavatera mauritanica Durieu subsp. **davaei** (Cout.) Cout. (*Malvenion parviflorae*)
Lavatera trimestris L. (*Cerintho majoris-Fedion cornucopiae*)
Leersia oryzoides (L.) Sw. (*Digitario ischaemi-Setarienion viridis*)

- Legousia hybrida** (L.) Delarbre (*Centaureetalia cyani*)
Lemna gibba L. (*Lemnion minoris*)
Lemna minor L. (*Lemnetalia minoris*)
Lemna trisulca L. (*Lemnion trisulcae*)
Leontodon autumnalis L. (*Cynosurion cristati*)
Leontodon bourgaeanus (see *Leontodon hispidus* subsp. *bourgaeanus*)
Leontodon cantabricus (see *Leontodon pyrenaicus* subsp. *cantabricus*)
Leontodon carpetanus Lange subsp. *carpetanus* (*Campanulo herminii-Nardion strictae*)
Leontodon filii (Hochst.) Paiva & Ormonde (*Festucion francoi*)
Leontodon herminicus (see *Leontodon pyrenaicus* subsp. *herminicus*)
Leontodon hispidus L. subsp. *bourgaeanus* (Willk.) Rivas-Mart. & C. Sáenz (*Linario saxatilis-Senecionion carpetani*)
Leontodon hispidus L. subsp. *hispidus* (*Festuco-Brometea*)
Leontodon longirostris (see *Leontodon taraxacoides* subsp. *longirostris*)
Leontodon pyrenaicus Gouan subsp. *cantabricus* (Widder) M. Lainz (*Teesdaliopsio-Luzulion caespitosae*)
Leontodon pyrenaicus Gouan subsp. *herminicus* Franco (*Teesdaliopsio-Luzulion caespitosae*)
Leontodon rigens (Dryand.) Paiva & Ormonde (*Festucion francoi*)
Leontodon salzmännii (Sch. Bip.) Ball. (*Thero-Brometalia*)
Leontodon taraxacoides (Vill) Merat subsp. *taraxacoides* (*Crucianelletalia maritimae*)
Leontodon taraxacoides (Vill.) Merat subsp. *longirostris* Finch & P.D. Sell (*Tuberarietalia guttatae*)
Leontodon tuberosus L. (*Poetea bulbosae*)
Lepidium graminifolium L. (*Sisymbrietalia officinalis*)
Lepidium latifolium L. (*Plantaginetalia majoris*)
Lepidium ruderales L. (*Matricario-Polygonion arenastris*)
Leucanthemopsis alpestre (see *Leucanthemopsis flaveola* subsp. *alpestre*)
Leucanthemopsis flaveola (Hoffmanns. & Link) Heywood subsp. *alpestre* (Mariz) Franco (*Teesdaliopsio-Luzulion caespitosae*)
Leucanthemopsis flaveola (Hoffmanns. & Link) Heywood subsp. *flaveola* (*Festucetalia curvifoliae*)
Leucanthemopsis pulverulenta (Lag.) Heywood (*Hieracio castellani-Plantaginion radicatae*)
Leucanthemum sylvaticum (Brot.) Nyman (*Linarion triornithophorae*)
Leucojum autumnale L. (*Poetea bulbosae*)
Leucojum trichophyllum Schousb. (*Malcolmietalia*)
Leuzea conifera (L.) DC. (*Rosmarinetalia officinalis*)
Leuzea longifolia Hoffmanns. & Link (*Genistion micrantho-anglicae*)
Leuzea rhaponticoides Graells (*Quercenion pyrenaicae*)
Ligustrum vulgare L. (*Prunetalia spinosae*)
Lilium martagon L. (*Quercu-Fagetalia*)
Limodorum abortivum (L.) Sw. (*Quercu-Fagetalia*)
Limodorum trabutianum (Batt.) Rouy (*Quercetalia ilicis*)
Limoniastrum monopetalum (L.) Boiss. (*Limoniastrion monopetali*)
Limonium algarvense Erben (*Limonium lanceolato-algarvensis*)
Limonium auriculatae-ursifolium (Pourr.) Durce (*Juncetea maritimi*)
Limonium binervosum (G.E. Sm.) C.E. Salmon (*Glauco-Puccinellietalia*)
Limonium callibotyrum (see *Limonium papillatum* var. *callibotyrum*)
Limonium daveaui Erben (*Limonium lanceolato-algarvensis*)
Limonium diffusum (see *Myriolimon diffusum*)
Limonium dodartii (Girard) Kuntze (*Limonio ovalifolii-Frankenion laevis*)
Limonium echioides (L.) Mill. (*Brachypodietalia distachyi*)
Limonium ferulaceum (see *Myriolimon ferulaceum*)
Limonium lanceolatum (Hoffmanns. & Link) Franco (*Limonium lanceolato-algarvensis*)
Limonium laxiusculum Franco (*Crithmo-Daucion halophili*)
Limonium lowei R. Jardim, M. Seq., Capelo & J.C. Costa (*Helichryson obconico-devium*)
Limonium multiflorum Erben (*Crithmo-Daucion halophili*)
Limonium nydeggeri Erben (*Crithmo-Daucion halophili*)
Limonium ovalifolium (Poir.) Kuntze (*Limonio ovalifolii-Frankenion laevis*)
Limonium papillatum (Webb & Berthel.) Kuntze var. *callibotyrum* (*Traganion moquini*)
Limonium plurisquamatum Erben (*Crithmo-Daucion halophili*)
Limonium virgatum (Willd.) Fourr. (*Crithmo-Limonietea*)
Limonium vulgare Mill. (*Glauco-Puccinellietalia*)
Linaria algarviana Chav. (*Hymenocarpo hamosi-Malcolmion trilobae*)
Linaria amethystea (Vent.) Hoffmanns & Link (*Scleranthion annui*)
Linaria bipunctata (L.) Chaz. subsp. *glutinosa* (Hoffmanns. & Link) D. A. Sutton (*Linario polygalifoliae-Vulpion alopecuroris*)
Linaria caesia subsp. *decumbens* (see *Linaria polygalifolia*)
Linaria elegans Cav. (*Molineriellion laevis*)
Linaria ficalhoana Rouy (*Linarion pedunculatae*)
Linaria glabrescens (see *Linaria saxatilis* subsp. *glabrescens*)
Linaria haenseleri Boiss & Reut. (*Brachypodion distachyi*)
Linaria hirta (L.) Moench (*Roemerion hybridae*)
Linaria lamarckii Rouy (*Helichryson picardii*)
Linaria micrantha (Cav.) Hoffmanns. & Link (*Brachypodion distachyi*)
Linaria munbyana Boiss. & Reut. subsp. *pygmaea* (Samp.) Rivas Mart. (*Linarion pedunculatae*)
Linaria navarroi (see *Linaria polygalifolia*)
Linaria pedunculata (L.) Chaz. (*Linarion pedunculatae*)
Linaria polygalifolia Hoffmanns. & Link (*Helichryson picardii*)
Linaria pygmaea (see *Linaria munbyana* subsp. *pygmaea*)
Linaria ricardoi Cout. (*Arnoseridenion minimae*)
Linaria saxatilis (L.) Chaz. subsp. *glabrescens* (Lange) M. Lainz (*Linario saxatilis-Senecionion carpetani*)
Linaria saxatilis (L.) Chaz. subsp. *saxatilis* (*Tuberarietalia guttatae*)
Linaria simplex (Willd.) DC. (*Brachypodion distachyi*)
Linaria spartea (L.) Chaz. (*Tuberarietalia guttatae*)
Linaria supina (L.) Mill. (*Thlaspietalia rotundifoliae*)
Linaria triornithophora (L.) Willd. (*Linarion triornithophorae*)
Linaria viscosa (L.) Chaz. (*Linario polygalifoliae-Vulpion alopecuroris*)
Linum angustifolium Huds. (*Molinio-Arrhenatheretea*)
Linum bienne Mill. (*Stipo-Agrostietea castellanae*)
Linum catharticum L. (*Festuco-Brometea*)
Linum narbonense L. (*Lygeo-Stipetalia*)
Linum spicatum (see *Linum strictum* var. *spicatum*)
Linum strictum L. var. *spicatum* Pers. (*Brachypodietalia distachyi*)
Linum strictum L. var. *strictum* (*Brachypodietalia distachyi*)
Linum tenue Desf. (*Molinio arundinacea-Holoschoenion vulgaris*)
Linum trigynum L. (*Tuberarietalia guttatae*)
Lithodora lusitanica (Samp.) Holub. (*Ulici argentei-Cistion ladaniferi*)
Lithodora prostrata (Loisel) Griseb. (*Calluno-Ulicetea*)
Lithospermum officinale L. (*Trifolio medii-Geranietalia sanguinei*)
Littorella uniflora (L.) Asch. (*Littorelletalia*)
Lobelia urens L. (*Molinetalia caeruleae*)

- Lobularia canariensis** (DC.) Borgen subsp. **rosula-venti** (Svent.) Borgen (*Traganion moquini*)
- Loeflingia baetica** Lag. var. **baetica** (*Hymenocarpus hamosi-Malcolmion trilobae*)
- Loeflingia baetica** Lag. var. **micrantha** (Boiss. & Reuter) Samp. (*Hymenocarpus hamosi-Malcolmion trilobae*)
- Loeflingia baetica** Lag. var. **tavaresiana** (Samp. ex Nobre) Rivas Mart. (*Hymenocarpus hamosi-Malcolmion trilobae*)
- Loeflingia hispanica** L. (*Corynephorus articulatae-Malcolmion trilobae*)
- Loeflingia micrantha* (see *Loeflingia baetica* var. *micrantha*)
- Loeflingia tavaresiana* (see *Loeflingia baetica* var. *tavaresiana*)
- Logfia gallica** (L.) Coss. & Germ. (*Tuberarietalia guttatae*)
- Logfia minima** (Sm.) Dumort. (*Tuberarietalia guttatae*)
- Lolium aristatum** (Willd.) Lag. (*Ornithopus pinnatae-Gaudinon coarctatae*)
- Lolium multiflorum** Lam. (*Plantaginetales majoris*)
- Lolium perenne** L. (*Plantaginetales majoris*)
- Lolium rigidum** Gaudin (*Thero-Brometalia*)
- Lonicera etrusca** G. Santi var. **etrusca** L. (*Quercetea ilicis*)
- Lonicera etrusca** Santi var. **glabrata** Lowe (*Sibthorpio peregrinae-Clethrion arborea*)
- Lonicera glabrata* (see *Lonicera etrusca* var. *glabrata*)
- Lonicera hispanica* (see *Lonicera periclymenum* subsp. *hispanica*)
- Lonicera implexa** Aiton (*Quercetea ilicis*)
- Lonicera periclymenum** L. subsp. **periclymenum** (*Quercetalia roboris*)
- Lonicera periclymenum** L. subsp. **hispanica** (Boiss. & Reut.) Nyman (*Pruno-Rubion ulmifolii*)
- Lotus angustissimus** L. (*Isoetion*)
- Lotus arenarius** Brot. (*Hymenocarpus hamosi-Malcolmion patulae*)
- Lotus argyroides** R.P. Murray (*Soncho ustulati-Artemision argenteae*)
- Lotus azoricus** P.W. Ball (*Tolpido succulentae-Agrostion congestiflorae*)
- Lotus carpetanus* (see *Lotus corniculatus* subsp. *carpetanus*)
- Lotus castellanus** Boiss. & Reuter (*Malcolmietalia*)
- Lotus conimbricensis** Brot. (*Tuberarietalia guttatae*)
- Lotus corniculatus** L. subsp. **carpetanus** (Laicata) Rivas Mart. (*Cistion laurifolii*)
- Lotus corniculatus** L. subsp. **corniculatus** (*Molinio-Arrhenatheretea*)
- Lotus creticus** L. (*Euphorbio paraliae-Ammophiletea australis*)
- Lotus edulis** L. (*Thero-Brometalia*)
- Lotus floridus* (see *Lotus glaucus* subsp. *floridus*)
- Lotus glaber** Mill. (*Plantaginetales majoris*)
- Lotus glaucus** Aiton subsp. **floridus** (Lowe) R. Jardim & M. Seq. (*Euphorbio paraliae-Lotion floridis*)
- Lotus glaucus** Aiton subsp. **glaucus** (*Euphorbio paraliae-Lotion floridis*)
- Lotus glaucus** Aiton subsp. **salvagensis** (R.P. Murray) Sadral & D.D. Sokolff (*Traganion moquini*)
- Lotus hispidus** Desf. ex DC. in Lam. & DC. (*Malcolmietalia*)
- Lotus lancerottensis** Webb & Berthel (*Traganion moquini*)
- Lotus loweanus** Webb & Berthel. (*Helichryson obconico-devium*)
- Lotus macranthus** Lowe (*Soncho ustulati-Artemision argenteae*)
- Lotus ornithopodioides** L. (*Thero-Brometalia*)
- Lotus parviflorus** Desf. (*Agrostion pourretii*)
- Lotus pedunculatus** Cav. (*Molinietalia caeruleae*)
- Lotus salvagensis* (see *Lotus glaucus* subsp. *salvagensis*)
- Lotus subbiflorus* (see *Lotus hispidus*)
- Ludwigia palustris** (L.) Elliott (*Nano-Cyperion*)
- Lupinus angustifolius** L. (*Thero-Brometalia*)
- Lupinus luteus** L. (*Thero-Brometalia*)
- Lupinus micranthus** Guss. (*Astragalo sesamei-Poion bulbosae*)
- Luzula baetica* (see *Luzula forsteri* subsp. *baetica*)
- Luzula campestris** (L.) DC. subsp. **campestris** (*Brometalia erecta*)
- Luzula campestris** (L.) DC. subsp. **carpetana** Rivas Mart. (*Campanulo herminii-Nardion strictae*)
- Luzula carpetana* (see *Luzula campestris* subsp. *carpetana*)
- Luzula cespitosa** J. Gay (*Teesdaliopsio-Luzulion caespitosae*)
- Luzula congesta* (see *Luzula multiflora* subsp. *congesta*)
- Luzula forsteri** (Sm.) DC. subsp. **baetica** P. Monts. (*Quercion broteroi*)
- Luzula forsteri** (Sm.) DC. subsp. **forsteri** (*Quercetalia roboris*)
- Luzula henriquesii** Degen (*Quercetalia roboris*)
- Luzula lactea** Link ex E.H.F. Mey. (*Ericenion aragonensis*)
- Luzula multiflora** (Retz.) Lej. subsp. **congesta** (Thuill.) Hyl. (*Violion caninae*)
- Luzula multiflora** (Retz.) Lej. subsp. **multiflora** (*Nardetalia strictae*)
- Luzula purpureo-splendens** Seub. (*Tolpido azoricae-Holcetea rigidi*)
- Luzula seubertii** Lowe (*Sibthorpio peregrinae-Clethrion arborea*)
- Lychnis flos-cuculi** L. (*Molinietalia caeruleae*)
- Lycium barbarum** L. (*Pegano-Salsoletea*)
- Lycium europaeum** L. (*Pegano-Salsoletea*)
- Lycium intricatum** Boiss. (*Pegano-Salsoletea*)
- Lycopodiella inundata** (L.) Holub (*Rhynchosporion albae*)
- Lycopodium clavatum** L. (*Lycopodio clavati-Juniperetum nanae*)
- Lycopus europaeus** L. (*Magno-Carici elatae-Phragmitetea australis*)
- Lysimachia azorica** Hoenem. ex Hook (*Tolpido azoricae-Holcetea rigidi*)
- Lysimachia ephemera** L. (*Molinio arundinacea-Holoschoenion vulgaris*)
- Lysimachia nemorum** L. (*Fagetalia sylvaticae*)
- Lysimachia vulgaris** L. (*Filipendulion ulmariae*)
- Lythrum borysthenicum** (Schränk) Litv. (*Isoetion*)
- Lythrum hyssopifolia** L. (*Isoeto-Nano-Juncetea*)
- Lythrum junceum** Banks & Sol (*Paspalo-Polypogonion viridis*)
- Lythrum portula** (L.) D.A. Webb (*Isoeto-Nano-Juncetea*)
- Lythrum salicaria** L. (*Magno-Carici elatae-Phragmitetea australis*)
- Lythrum thymifolia** L. (*Isoeto-Nano-Juncetea*)
- Lythrum tribracteatum** Spreng. (*Nano-Cyperetalia*)
- Magydaris panacifolia** (Vahl) Lange (*Balloto-Conion maculati*)
- Malcolmia gracilima* (see *Malcolmia triloba* subsp. *gracilima*)
- Malcolmia lacera* (see *Malcolmia triloba* subsp. *triloba*)
- Malcolmia littorea** (L.) Br. (*Crucianellalia maritima*)
- Malcolmia patula* (see *Malcolmia triloba* subsp. *patula*)
- Malcolmia ramosissima** (Desf.) Thell. (*Cutandietalia maritima*)
- Malcolmia triloba** (L.) Spreng. subsp. **gracilima** (Samp.) Franco (*Hymenocarpus hamosi-Malcolmion trilobae*)
- Malcolmia triloba** (L.) Spreng. subsp. **patula** (Lag. ex DC.) Rivas Mart. & G. Navarro (*Corynephorus articulatae-Malcolmion patulae*)
- Malcolmia triloba** (L.) Spreng. subsp. **triloba** (*Hymenocarpus hamosi-Malcolmion trilobae*)
- Malope trifida** Cav. (*Cerintho majoris-Fedion cornucopiae*)
- Malus sylvestris** (L.) Mill. (*Populetales albae*)
- Malva colmeiroi** Willk. (*Linarion triornithophorae*)
- Malva hispanica** L. (*Thero-Brometalia*)
- Malva neglecta** Wallr. (*Sisymbrium officinalis*)
- Malva nicaeensis** All. (*Chenopodion muralis*)
- Malva parviflora** L. (*Malvenion parviflorae*)

- Malva sylvestris** L. (*Sisymbrietalia officinalis*)
Malva tournefortiana L. (*Agrostietalia castellanae*)
Mantisalca salmantica (L.) Briq. & Cavill. (*Brachypodietalia phoenicoidis*)
Marcetella maderensis (Bornem.) Svent. (*Myrico fayoi-Ericion arboreae*)
Marrubium vulgare L. (*Artemisietea vulgaris*)
Marsilea batardae Launert (*Menthion cervinae*)
Marsilea quadrifolia L. (*Littorelletalia*)
Marsupella emarginata (Ehrh.) Durmot. (*Montio-Cardaminetalia*)
Matricaria aurea Loefl. (*Polycarpion tetraphylli*)
Matricaria discoidea DC. (*Matricario-Polygonion arenastris*)
Matricaria maritima L. (*Brassicion oleraceae*)
Matricaria recutita L. (*Stellarietea mediae*)
Matthiola incana (L.) R.Br. (*Parietarietalia*)
Matthiola maderensis Lowe (*Sinapidendro angustifolii-Aeonion glutinosi*)
Matthiola parviflora (Schousb.) R.Br. (*Thero-Brometalia*)
Matthiola sinuata (L.) Br. (*Crucianelletalia maritima*)
Maytenus umbellata (R.Br.) Mabb. (*Mayteno umbellatae-Oleion maderensis*)
Medicago arabica (L.) Huds. (*Trifolio fragiferi-Cynodontion*)
Medicago falcata L. (*Festuco-Brometea*)
Medicago intertexta (L.) Mill. (*Astragalo sesamei-Poion bulbosae*)
Medicago littoralis Rohde ex Loisel. (*Tuberarietea guttatae*)
Medicago marina L. (*Euphorbio paraliae-Ammophiletea arundinaceae*)
Medicago minima (L.) L. (*Tuberarietea guttatae*)
Medicago murex Willd. (*Echio plantaginei-Galactition tomentosae*)
Medicago orbicularis (L.) Bartal. (*Thero-Brometalia*)
Medicago polymorpha L. (*Sisymbrietalia officinalis*)
Medicago rigidula (L.) All. (*Thero-Brometalia*)
Medicago sativa L. subsp. **sativa** (*Brachypodietalia phoenicoidis*)
Medicago truncatula Gaetener (*Thero-Brometalia*)
Melampyrum pratense L. (*Trifolio medii-Geranietea sanguinei*)
Melanoselinum decipiens (Schrad. & Wendl.) Hoffm. (*Euphorbion melliferae*)
Melica arrecta (see *Melica minuta* subsp. *arrecta*)
Melica ciliata L. subsp. **magnolii** (Gren. & Godr.) K. Richt. (*Brachypodietalia phoenicoidis*)
Melica minuta L. subsp. **arrecta** (G. Kunz) Breistr. (*Quercetalia ilicis*)
Melica minuta L. subsp. **minuta** (*Asplenietalia petrarchae*)
Melica uniflora Retz (*Fagetalia sylvaticae*)
Melilotus albus Medicus (Dauco-Melilotion)
Melilotus elegans Salzm. ex Ser. in DC. (*Echio plantaginei-Galactition tomentosae*)
Melilotus indicus (L.) All. (*Holoschoenetalia vulgaris*)
Melilotus italicus (L.) Lam. (*Echio plantaginei-Galactition tomentosae*)
Melilotus officinalis (L.) Pall. (*Dauco-Melilotion*)
Melilotus segetalis (Brot.) Ser. subsp. **segetalis** (*Stellarietea mediae*)
Melilotus siculus (Turra) B.D. Jacks. (*Juncetalia maritimi*)
Melilotus spicatus (Sm.) Breistr. (*Thero-Brometalia*)
Melilotus sulcatus Desf. (*Thero-Brometalia*)
Melitis melissophyllum L. (*Quercu-Fagetea*)
Mentha aquatica L. (*Phragmitetalia*)
Mentha cervina L. (*Menthion cervinae*)
Mentha longifolia (L.) Huds. (*Potentillo anserinae*)
Mentha pulegium L. (*Isoeto-Nano-Juncetea*)
Mentha suaveolens Ehrh. (*Potentillo anserinae*)
Menyanthes trifoliata L. (*Scheuchzerio palustris-Caricetea nigrae*)
Mercurialis ambigua L. f. (*Stellarietea mediae*)
Mercurialis annua L. (*Stellarietea mediae*)
Mercurialis elliptica Poir. in Lam. (*Parietarion lusitanico-mauritanicae*)
Mercurialis perennis L. (*Quercu-Fagetea*)
Mercurialis tomentosa L. (*Salsolo vermiculatae-Peganetalia harmalae*)
Merendera filifolia Cambess. (*Plantaginion serrariae*)
Mesembryanthemum crystallinum L. (*Mesembryanthemion crystallini*)
Mesembryanthemum nodiflorum L. (*Mesembryanthemion crystallini*)
Mibora minima (L.) Desv. (*Tuberarietea guttatae*)
Micromeria cacuminicola (see *Micromeria varia* subsp. *thymoides* var. *cacuminicola*)
Micromeria graeca var. *micrantha* (see *Satureja graeca* var. *micrantha*)
Micromeria juliana (L.) Lange (*Parietario-Galion muralis*)
Micromeria varia Benth subsp. **thymoides** (Sol. ex Lowe) P. Pérez var. **thymoides** (*Soncho ustulati-Artemision argenteae*)
Micromeria varia Benth subsp. **thymoides** Sol. ex Lowe var. **cacuminicola** (P. Pérez) Rivas. Mart. (*Sinapidendro angustifolii-Aeonion glutinosi*)
Micropus supinus L. (*Brachypodietalia distachyi*)
Micropyrum patens (Brot.) Pilger (*Molineriellion laevis*)
Micropyrum tenellum (L.) Link (*Tuberarietalia guttatae*)
Minuartia hybrida (Vill.) Schischk. subsp. **hybrida** (*Tuberarietea guttatae*)
Minuartia recurva (All.) Schinz & Thell. subsp. **juressi** (Willd. ex Schlecht) Mattf. (*Festucetalia curvifoliae*)
Misopates orontium (L.) Rafin. (*Solano nigri-Polygonetalia convolvuli*)
Moehringia pentandra J. Gay (*Quercetalia ilicis*)
Moehringia trinervia (L.) Clairrv. (*Fagetalia*)
Moenchia erecta (L.) P. Gaertn., B. Mey & Soherb. (*Tuberarietalia guttatae*)
Molineriella australis (see *Molineriella minuta* subsp. *australis*)
Molineriella laevis (Brot.) Rouy (*Tuberarietalia guttatae*)
Molineriella minuta (Brot.) Rouy subsp. **australis** (Paunero) Rivas Mart. (*Tuberarion guttatae*)
Molineriella minuta (Brot.) Rouy subsp. **minuta** (*Tuberarion guttatae*)
Molinia arundinacea (see *Molinia caerulea* subsp. *arundinacea*)
Molinia caerulea (L.) Moench subsp. **arundinacea** (Schrank) Soják (*Molinio arundinacea-Holoschoenion vulgaris*)
Molinia caerulea (L.) Moench subsp. **caerulea** (*Molinetalia caeruleae*)
Mollugo cervina (L.) Ser. (*Diplotaxion erucoidis*)
Monanthes lowei P. Pérez & Acebes (*Aichryso laxi-Monanthon laxiflorae*)
Monizia edulis Lowe (*Sinapidendro angustifoliae-Aeonion glutinosi*)
Monotropa hypopitys L. (*Fagetalia sylvaticae*)
Montia fontana L. subsp. **amporitana** Senne (*Montio-Cardaminetalia*)
Murbeckiella boryi (Boiss.) Rothm. subsp. **herminii** Rivas Mart. (*Saxifragion willkommianae*)
Murbeckiella herminii (see *Murbeckiella boryi* subsp. *herminii*)
Murbeckiella sousae Rothm. (*Murbeckiello sousae-Silenetum acutifoliae*)
Muscari comosum (L.) Mill. (*Stellarietea mediae*)
Musschia aurea (L.f) Dumort. (*Sinapidendro angustifolii-Aeonion glutinosi*)
Musschia wollastonii Lowe (*Euphorbion melliferae*)
Myosotis arvensis (L.) Hill (*Solano nigri-Polygonetalia convolvuli*)
Myosotis azorica Wats. (*Festucion francoi*)
Myosotis caespitosa C. F. Schultz (*Glycerio-Sparganion*)

- Myosotis canariensis* (see *Myosotis discolor* subsp. *canariensis*)
- Myosotis debilis** Pomel (*Mentha cervinae*)
- Myosotis discolor** Pers. subsp. **canariensis** (Pit.) Grau (*Geranio purpurei-Torilidion neglectae*)
- Myosotis discolor** Pers. subsp. **discolor** (*Arnoseridenion minimae*)
- Myosotis lusitanica** Schuster (*Eleocharition multicaulis*)
- Myosotis maritima** Hochst. ex Steud. (*Euphorbio azoricae-Festucion petraeae*)
- Myosotis ramosissima** Rachel in subsp. **ramosissima** (*Geranio pusilli-Anthriscion caucalidis*)
- Myosotis retusifolia** Rocha Afonso (*Isoetion*)
- Myosotis stolonifera** (DC) J. Gay ex Leresche & Levier (*Myosotidion stoloniferae*)
- Myosotis sylvatica** (Ehrh.) Hoffm. (*Epilobietea angustifoliae*)
- Myosoton aquaticum** (L.) Moench (*Senecionion fluviatilis*)
- Myrica faya** Aiton (*Pruno hixae-Lauretea novocanariensis*)
- Myrica gale** L. (*Alnetea glutinosae*)
- Myriolimon diffusum** (Pourr.) Lledó, Erben & Crespo (*Limonion lanceolato-algarvensis*)
- Myriolimon ferulaceum** (L.) Lledó, Erben & Crespo (*Arthrocnemion macrostachyi*)
- Myriophyllum alterniflorum** DC. (*Littorelletalia*)
- Myriophyllum spicatum** L. (*Potametea*)
- Myriophyllum verticillatum** L. (*Nymphaeion albae*)
- Myrrhoides nodosa** (L.) Cannon (*Galio-Alliarion petiolatae*)
- Myrsine retusa** Aiton (*Lauro azoricae-Juniperetea brevifoliae*)
- Myrtus communis** L. (*Pistacio lentisci-Rhamnetalia alaterni*)
- Najas marina** L. (*Zannichellion pedicellatae*)
- Narcissus bulbocodium** L. subsp. **nivalis** (Graells) Cout. (*Campanulo herminii-Nardion strictae*)
- Narcissus bulbocodium** L. subsp. **obesus** Salisb.) Maire (*Brachypodion phoenicoidis*)
- Narcissus calcicola** Mendonça (*Asplenion petrarchae*)
- Narcissus confusus** (see *Narcissus pseudonarcissus* subsp. *confusus*)
- Narcissus cyclamineus** DC. (*Pulmonario longifoliae-Quercion roboris*)
- Narcissus henriquesii** (see *Narcissus jonquilla* var. *henriquesii*)
- Narcissus jonquilla** L. var. **henriquesii** Samp. (*Festucion duriotaganae*)
- Narcissus nivalis** (see *Narcissus bulbocodium* subsp. *nivalis*)
- Narcissus obesus** (see *Narcissus bulbocodium* subsp. *obesus*)
- Narcissus pallidulus** (see *Narcissus triandrus* subsp. *pallidulus*)
- Narcissus pseudonarcissus** L. subsp. **confusus** (Pugsley) A. Fernandes (*Campanulo herminii-Nardion strictae*)
- Narcissus rupicola** Dufour (*Rumici indurati-Dianthion lusitani*)
- Narcissus serotinus** L. (*Poetalia bulbosae*)
- Narcissus triandrus** L. subsp. **pallidulus** (Graells) Rivas Goday ex Fern. Casas (*Lavanduletalia stoechadis*)
- Narcissus willkommii** (Samp.) A. Fernandes (*Agrostion castellanae*)
- Nardia compressa** (Hook.) Gray (*Montio-Cardaminetalia*)
- Nardus stricta** L. (*Nardetalia strictae*)
- Narthecium ossifragum** (L.) Huds. (*Trichophorenion germanici*)
- Neatostema apulum** (L.) I.M. Johnst. (*Brachypodietalia distachyi*)
- Neckera crispa** Hedwg. (*Polypodion cambrici*)
- Neckera pumila** Hedwg. (*Polypodion cambrici*)
- Neotinea maculata** (Desf.) Stearn. (*Quercetea ilicis*)
- Neottia nidus-avis** (L.) Rich. (*Fagetalia sylvaticae*)
- Nepeta coerulea** Aiton subsp. **sanabrensis** (Losa) Uebera & Valdés (*Linarion triornithophorae*)
- Nepeta latifolia** DC. (*Arction lappae*)
- Nepeta tuberosa** L. subsp. **tuberosa** (*Brachypodietalia phoenicoidis*)
- Nerium oleander** L. (*Nerio-Tamaricetea*)
- Neslia apiculata** Fish, C.A. Mey. & Av'r-Lall. (*Centaureetalia cyani*)
- Nicotiana glauca** Graham (*Nicotiano glauci-Ricinion communis*)
- Nigella atlantica** (Murb.) Rivas Mart. (*Roemerion hybridae*)
- Nigella damascena** L. (*Centaureetalia cyani*)
- Nigella gallica** Jord. (*Centaureetalia cyani*)
- Nigella papillosa** G. López (*Ridolfion segetum*)
- Nitella batrachosperma** (Recbh.) A. Braun (*Nitelletalia flexilis*)
- Nitella capillaris** (Krock.) J. Gr. & Bullock-Webster (*Nitelletalia flexilis*)
- Nitella flexilis** (L.) Agardh (*Nitellion flexilis*)
- Nitella gracilis** (Smith) C. Agardh (*Nitellion flexilis*)
- Nitella hyalina** (DC.) Agardh (*Nitellion flexilis*)
- Nitella mucronata** (*Nitelletalia flexilis*)
- Nitella opaca** (Bruz.) Agardh (*Nitelletalia flexilis*)
- Nitella syncarpa** (Thuill.) Chev. (*Nitellion syncarpo-tenuissimae*)
- Nitella tenuissima** (Desv.) Kutz (*Nitellion syncarpo-tenuissimae*)
- Nitella translucens** (Pers.) Agardh (*Nitelletalia flexilis*)
- Nonea vesicaria** (L.) Rchb. (*Thero-Brometalia*)
- Normania triphylla** (Lowe) Lowe (*Sibthorpio peregrinae-Clethron arboreae*)
- Notholaena marantae** (L.) Desv. subsp. **marantae** (*Cheilanthes maranto-maderensis*)
- Notholaena marantae** (L.) Desv. subsp. **subcordata** (Cav.) Kunk. (*Cheilanthon pulchellae*)
- Notholaena subcordata** (see *Notholaena marantae* subsp. *subcordata*)
- Notobasis syriaca** (L.) Cass. (*Onopordion castellani*)
- Nuphar lutea** (L.) Sm. (*Nymphaeion albae*)
- Nymphaea alba** L. (*Nymphaeion albae*)
- Ocotea foetens** (Aiton) Benth. & Hook.f. (*Pruno hixae-Lauretea novocanariensis*)
- Odontites holliana** (Lowe) Benth. (*Geranio pusilli-Anthriscion caucalidis*)
- Odontites verna** (Bellardi) Dumort. (*Scleranthion annui*)
- Oenanthe crocata** L. (*Phalaridenion arundinaceae*)
- Oenanthe divaricata** (R. Br.) Mabb. (*Deschampsion argenteae*)
- Oenanthe fistulosa** L. (*Magno-Carici elatae-Phragmitetea australis*)
- Oenanthe globulosa** L. (*Glycerio-Sparganion*)
- Oenanthe lachenalii** G. Gmel. (*Molinio-Arrhenatheretea*)
- Oenanthe pimpinelloides** L. (*Holoschoenetalia vulgaris*)
- Oenothera affinis** Camb. (*Elytrigietalia repentis*)
- Oenothera biennis** L. (*Elytrigietalia repentis*)
- Oenothera glazioviana** Micheli (*Elytrigietalia repentis*)
- Olea europaea** L. var. **sylvestris** (Mill.) Rouy ex Hegi (*Quercetea ilicis*)
- Olea maderensis** (Lowe) Rivas Mart. & Del Arco (*Mayteno umbellatae-Oleion maderensis*)
- Omphalodes kuzinskyanae** Willd. (*Omphalodo kuzinskyanae-Evacietum lusitanicae*)
- Omphalodes linifolia** (L.) Moench (*Brachypodion distachyi*)
- Omphalodes nitida** Hoffmanns. & Link (*Linarion triornithophorae*)
- Onobrychis humilis** (L.) G. López (*Periballio-Trifolion subterranei*)
- Onobrychis viciifolia** Scop (*Brachypodietalia erecti*)
- Ononis baetica** Clemente (*Hymenocarpus hamosi-Malcolmion trilobae*)
- Ononis breviflora** (see *Ononis viscosa* subsp. *breviflora*)
- Ononis broteroana** DC. (*Hymenocarpus hamosi-Malcolmion trilobae*)

- Ononis cintrana** Brot. (*Tuberarion guttatae*)
Ononis cossoniana Boiss. & Reut. (*Linarion pedunculatae*)
Ononis dentata Sol. ex Lowe (*Hymenocarpus hamosi-Malcolmion trilobae*)
Ononis diffusa Ten. (*Malcolmietalia*)
Ononis hackelii Lange (*Hymenocarpus hamosi-Malcolmion trilobae*)
Ononis pinnata Brot. (*Linarion polygalifoliae-Vulpion alopecuroris*)
Ononis pubescens L. (*Brachypodietalia distachyi*)
Ononis pusilla L. (*Rosmarinetalia officinalis*)
Ononis ramosissima Desf. (*Crucianelletalia maritima*)
Ononis reclinata L. (*Brachypodietalia distachyi*)
Ononis spinosa L. subsp. **spinosa** (*Brachypodietalia erecti*)
Ononis variegata L. (*Cutandietalia maritimae*)
Ononis viscosa L. subsp. **breviflora** (DC.) Nyman (*Brachypodietalia distachyi*)
Onopordum acanthium L. subsp. **acanthium** (*Onopordenea acanthii*)
Onopordum illyricum L. (*Onopordetalia acanthii*)
Onopordum macrocanthum Schous. (*Onopordion castellani*)
Onopordum nervosum Boiss. subsp. **nervosum** (*Onopordion castellani*)
Ophioglossum azoricum C. Presl. (*Nardetea strictae*)
Ophioglossum lusitanicum L. (*Isoetetalia*)
Ophrys apifera Huds. (*Festuco-Brometea*)
Ophrys bombyliflora Link in Schrad. (*Teucricio pseudochamaepityos-Brachypodion retusi*)
Ophrys drys Maire (*Lygeo-Stipetalia*)
Ophrys fusca Link in Schrad. (*Brachypodietalia phoenicoidis*)
Ophrys lutea Cav. (*Lygeo-Stipetalia*)
Ophrys scolopax Cav. (*Brachypodietalia phoenicoidis*)
Ophrys speculum Link (*Brachypodietalia phoenicoidis*)
Ophrys tenthredinifera Willd. (*Teucricio pseudochamaepityos-Brachypodion retusi*)
Ophrys vernixia Brot. (*Lygeo-Stipetea*)
Orchis champagneuxii (see *Orchis morio* subsp. *champagneuxii*)
Orchis conica Willd. (*Brachypodietalia phoenicoidis*)
Orchis coriophora L. subsp. **coriophora** (*Molinio-Arrhenatheretea*)
Orchis coriophora L. subsp. **fragrans** (Pollini) K. Richt. (*Brachypodion phoenicoidis*)
Orchis coriophora L. subsp. **martrinii** (Timb.-Lagr.) Nyman (*Molinio-Arrhenatheretea*)
Orchis fragrans (see *Orchis coriophora* subsp. *fragrans*)
Orchis italica Poir. in Lam. (*Brachypodietalia phoenicoidis*)
Orchis langei K. Richt. (*Quercu-Fagetea*)
Orchis laxiflora Lam. (*Molinio-Arrhenatheretea*)
Orchis martrinii (see *Orchis coriophora* subsp. *martrinii*)
Orchis mascula (L.) L. subsp. **mascula** (*Brometalia erecti*)
Orchis mascula (L.) L. subsp. **olbiensis** (Reut. ex Gren.) Asch. & Graebn. (*Cisto-Lavanduletea*)
Orchis morio L. subsp. **champagneuxii** (Barn.) Camus (*Cisto-Lavanduletea*)
Orchis morio L. subsp. **morio** (*Brometalia erecti*)
Orchis morio L. subsp. **picta** (Loisel.) Arcang. (*Cisto-Lavanduletea*)
Orchis olbiensis (see *Orchis mascula* subsp. *olbiensis*)
Orchis picta (see *Orchis morio* subsp. *picta*)
Orchis scopulorum Summerh. (*Deschampsio maderensis-Parafestucion albidae*)
Origanum macrostachyum (see *Origanum virens* var. *macrostachyum*)
Origanum virens Hoffmanns. & Link var. **macrostachyum** (Hoffmanns. & Link) Cout. (*Origanion virentis*)
Origanum virens Hoffmanns. & Link var. **virens** (*Origanion virentis*)
Origanum vulgare L. (*Trifolio medii-Geranietea sanguinei*)
Ornithogalum baeticum (see *Ornithogalum orthophyllum* subsp. *baeticum*)
Ornithogalum broteroi Lainz (*Sedion anglici*)
Ornithogalum concinnum (Salisb.) Cout. (*Jasiono sessiliflorae-Koelerietalia crassipedis*)
Ornithogalum narbonense L. (*Lygeo-Stipetalia*)
Ornithogalum orthophyllum Ten subsp. **baeticum** (Boiss.) Zahar. (*Poetea bulbosae*)
Ornithogalum pyrenaicum L. (*Fagetalia sylvaticae*)
Ornithopus compressus L. (*Tuberarietalia guttatae*)
Ornithopus isthmocarpus Coss. (*Malcolmietalia*)
Ornithopus perpusillus L. (*Tuberarietalia guttatae*)
Ornithopus pinnatus (Mill.) Druce (*Tuberarion guttatae*)
Ornithopus sativus Brot. (*Malcolmietalia*)
Orobanche gracilis Sm. (*Festuco-Brometea*)
Orobanche latisquama (F.W. Schultz) Batt. (*Rosmarinetalia officinalis*)
Orobanche rapum-genistae Thuill. (*Cytisetalia scopario-striati*)
Ortega hispanica Loef. ex L. (*Hieracio castellani-Plantaginion radicatae*)
Osmunda regalis L. (*Populetalia albae*)
Osyris alba L. (*Pistacio lentisci-Rhamnetalia alaterni*)
Osyris quadripartita Decne (*Pistacio lentisci-Rhamnetalia alaterni*)
Otanthus maritimus (L.) Hoffmann. & Link (*Ammophiletalia arundinaceae*)
Oxalis acetosella L. (*Quercu-Fagetea*)
Oxalis articulata Savigny in Lam. (*Urtico piluliferae-Silybion mariani*)
Oxalis corniculata L. (*Stellarietea mediae*)
Oxalis latifolia Kunth (*Polygono-Chenopodion polyspermi*)
Oxalis pes-caprae L. (*Fumarion wirtgenii-agrariae*)
Paedia broteroi Boiss. & Reut. (*Quercion broteroi*)
Palhinhaea cernua (L.) Vasc. & Franco (*Daboecion azoricae*)
Pancreatium maritimum L. (*Euphorbio paraliae-Ammophiletea arundinaceae*)
Panicum repens L. (*Nerio-Tamaricetea*)
Papaver argemone L. (*Scleranthion annui*)
Papaver dubium L. (*Centaureetalia cyani*)
Papaver hybridum L. (*Stellarietea mediae*)
Papaver pinnatifidum Moris (*Roemerion hybridae*)
Papaver rhoeas L. (*Centaureetalia cyani*)
Papaver somniferum L. subsp. **setigerum** (DC.) Arcang. (*Stellarietea mediae*)
Paradisea lusitanica (Cout.) Samp. (*Bromo ramosi-Eupatorion cannabini*)
Parafestuca albida (Lowe) Alexeev (*Deschampsio maderensis-Parafestucion albidae*)
Parapholis filiformis (Roth) C.E. Hubb. (*Frankenietalia pulverulentae*)
Parapholis incurva (L.) C.E. Hubb. (*Saginetea maritimae*)
Parapholis strigosa (Dumort.) C.E. Hubb. (*Saginetea maritimae*)
Parentiella latifolia (L.) Caruel in Parl. (*Poetalia bulbosae*)
Parietaria debilis Forster f. (*Geranio purpurei-Torilidion neglectae*)
Parietaria judaica L. (*Parietarietalia*)
Parietaria lusitanica L. (*Parietarion lusitanico-mauritanicae*)
Parietaria mauritanica Durieu (*Parietarion lusitanico-mauritanicae*)
Parnassia palustris L. (*Scheuchzerio palustris-Caricetea nigrae*)
Paronychia argentea Lam. (*Poetalia bulbosae*)
Paronychia cymosa (L.) DC. (*Tuberarion guttatae*)
Paronychia echinulata Charter (*Tuberarion guttatae*)
Paronychia polygonifolia (Vill.) DC. (*Androsacetalia alpinae*)
Paspalum dilatatum Poir. in Lam. (*Paspalo distichi-Polypogonion viridis*)
Paspalum distichum L. (*Paspalo distichi-Polypogonion viridis*)

- Paspalum paspalodes* (see *Paspalum distichum*)
Paspalum vaginatum Sw. (*Spergulario-Paspalenion vaginati*)
Patellifolia patellaris (Moq.) A. J. Scott, Ford-Lloyd & J. T. Williams (*Chenopodio-Stellarietanea*)
Patellifolia procumbens (C. Sm. ex Hornem) A. J. Scott, Ford-Lloyd & J. T. Williams (*Mesembryanthemion crystallini*)
Pedicularis lusitanica (see *Pedicularis sylvatica* subsp. *lusitanica*)
Pedicularis palustris L. subsp. **palustris** (*Scheuchzerio palustris-Caricetea nigrae*)
Pedicularis sylvatica L. subsp. **lusitanica** (Hoffmanns. & Link) Cout. (*Stauracanthion boivinii*)
Pedicularis sylvatica L. subsp. **sylvatica** (*Nardetalia strictae*)
Pellia endiviifolia (Dicks.) Dumort. (*Adiantetalia capilli-venensis*)
Pellia epiphylla (L.) Corda (*Montio-Cardaminetalia*)
Pennisetum setaceum (Forssk.) Chiov. (*Hyparrhenion sinicae*)
Pentaglottis sempervirens (L.) Tausch ex L.H. Bailey (*Alliarionion petiolatae*)
Periballia involucreta (Cav.) Janka (*Molineriellion laevis*)
Pericallis aurita (L'Her.) B. Nord. (*Ranunculo cortusifolii-Geranion canariensis*)
Pericallis malvifolia (L'Her.) B. Nord. (*Pericallion malvifoliae*)
Periploca laevigata Aiton (*Kleinio-Euphorbietea canariensis*)
Persea indica (L.) K. Spreng. (*Pruno hixae-Lauretalia novocanariensis*)
Petrorhagia nanteuillii (Burnat) P.W. Ball & Heywood (*Tube-riaritea guttatae*)
Petrorhagia saxifraga (L.) Link (*Jasiono sessiliflorae-Koele-rietalia crassipedis*)
Peucedanum lancifolium Lange (*Salici atrocineriae-Alnenion glutinosae*)
Peucedanum lowei (Coss.) Menezes (*Deschampsion argenteae*)
Phagnalon bennetii (see *Phagnalon loweii*)
Phagnalon loweii DC. (*Soncho ustulati-Artemision argenteae*)
Phagnalon rupestre (L.) DC. (*Asplenietalia petrarchae*)
Phagnalon saxatile (L.) Cass. subsp. **saxatile** (*Lygeo-Stipetea*)
Phalacrocarpon hoffmannseggii (Samp.) Lainz (*Festucion merinoi*)
Phalacrocarpon oppositifolium (Brot.) Willk. (*Festucion merinoi*)
Phalaris aquatica L. (*Holoschoenetalia vulgaris*)
Phalaris arundinacea L. (*Phalaridenion arundinaceae*)
Phalaris brachystachys Link in Schrad. (*Thero-Brometalia*)
Phalaris canariensis L. (*Thero-Brometalia*)
Phalaris coerulescens Desf. subsp. **coerulescens** (*Gaudinio verticolae-Hordeion bulbosi*)
Phalaris coerulescens Desf. subsp. **lusitanica** Rocha Afonso & Franco (*Gaudinio verticolae-Hordeion bulbosi*)
Phalaris lusitanica (see *Phalaris coerulescens* subsp. *lusitanica*)
Phalaris minor Retz (*Thero-Brometalia*)
Phalaris paradoxa L. (*Ridolfion segeti*)
Phegopteris connectilis (Michaux) Watt (*Polystichetalia lonchitidis*)
Phillyrea angustifolia L. (*Pistacio lentisci-Rhamnetalia alaterni*)
Phillyrea latifolia L. subsp. **latifolia** (*Quercetalia ilicis*)
Phillyrea latifolia L. subsp. **media** (L.) Fourn. (*Quercetea ilicis*)
Phillyrea media (see *Phillyrea latifolia* subsp. *media*)
Philonotis fontana (Hedw.) Brid. (*Montio-Cardaminetalia*)
Philonotis seriata Mitt. (*Cardamino amarae-Montion fontanae*)
Philonotis tomentella Molendo (*Cardamino amarae-Montion fontanae*)
Phleum arenarium L. (*Cutandietalia maritimae*)
Phleum bertolonii (see *Phleum pratense* subsp. *bertolonii*)
Phleum phleoides (L.) Karsten (*Festuco-Brometea*)
Phleum pratense L. subsp. **bertolonii** (DC.) Bornm. (*Molinio-Arrhenatheretea*)
- Phleum pratense** L. subsp. **pratense** (*Cynosurion cristati*)
Phlomis lychnitis L. (*Teucro pseudochamaepityos-Brachypodion retusi*)
Phlomis purpurea L. (*Asparago albi-Rhamnion oleoidis*)
Phragmites australis (Cav.) Trin. ex Steud. (*Magno-Carici-elatae-Phragmitetea australis*)
Phyllanthus tenellus Roxb. (*Apio leptophyllae-Oxalidetum pes-caprae*)
Phyllis nobla L. (*Pruno hixae-Lauretea novocanariensis*)
Phyllitis scolopendrium (L.) Newman (*Pulmonario longifoliae-Quercion roboris*)
Phymatoceros bulbiculosus (Brot.) Prosk (*Isoetion*)
Physcomitrium pyriforme (Hedw.) Hamp. (*Nano-Cyperetalia*)
Physospermum cornubiense (L.) DC. (*Quercion pyrenaicae*)
Picconia azorica (Tutin) Knobl. (*Myrico fayae-Pittosporion undulati*)
Picconia excelsa (Aiton) DC. (*Visneo mocanerae-Apollonion barbujaanae*)
Picris algarbiensis Franco (*Stachyo lusitanicae-Cheirolophenion sempervirentis*)
Picris echioides L. (*Artemisienea vulgaris*)
Picris hieracioides L. subsp. **longifolia** (Boiss. & Reuter) P.D. Sell (*Linarion triornithophorae*)
Picris spinifera Franco (*Stachyo lusitanicae-Cheirolophenion sempervirentis*)
Pilularia globulifera L. (*Eleocharition multicaulis*)
Pilularia minuta Durieu in Bory & Durieu (*Isoetion*)
Pimpinella villosa Schousb. (*Malcolmietalia*)
Pinguicula lusitanica L. (*Anagallido-Juncion bulbosi*)
Pinguicula vulgaris L. (*Scheuchzerio palustris-Caricetea nigrae*)
Pinus halepensis Mill. (*Pistacio lentisci-Rhamnetalia alaterni*)
Pinus pinaster Aiton subsp. **atlantica** Villar (*Pistacio lentisci-Rhamnetalia alaterni*)
Pinus sylvestris L. var. **iberica** Svob. (*Junipero sabiniae-Pinetea sylvestris*)
Piptatherum coerulescens (Desf.) P. Beauv. (*Parietarietalia*)
Piptatherum miliaceum (L.) Coss. subsp. **miliaceum** (*Bromo-Piptatherion miliacei*)
Piptatherum miliaceum (L.) Coss. subsp. **thomasi** (Duby) Freitag (*Bromo-Piptatherion miliacei*)
Piptatherum paradoxum (L.) P. Beauv. (*Quercetalia ilicis*)
Piptatherum thomasi (see *Piptatherum miliaceum* subsp. *thomasi*)
Pistacia lentiscus L. (*Pistacio lentisci-Rhamnetalia alaterni*)
Pistacia terebinthus L. (*Pistacio lentisci-Rhamnetalia alaterni*)
Pittosporum coriaceum Dryand. ex Aiton (*Sibthorpio peregrinae-Clethrion arboreae*)
Pittosporum undulatum Vent. (*Myrico fayae-Pittosporion undulati*)
Plagiochila spinulosa (Dick) Dumort. (*Anomodonto-Polypodieta*)
Plantago acanthophylla (see *Plantago radicata* subsp. *acanthophylla*)
Plantago afra L. (*Thero-Brometalia*)
Plantago albicans L. (*Astragalo sesamei-Poion bulbosae*)
Plantago almogravensis Franco (*Crithmo-Daucion halophili*)
Plantago arborescens Poir. subsp. **costae** (Menezes) M. Seq. & R. Jardim (*Bystropogono punctati-Telinion maderensis*)
Plantago bellardii All. (*Tube-riariention guttatae*)
Plantago coronopus L. subsp. **coronopus** (*Polygono arenastri-Poetalia annuae*)
Plantago coronopus L. subsp. **occidentalis** (Pigler) Franco (*Crithmo-Daucion halophili*)
Plantago costae (see *Plantago arborescens* subsp. *costae*)
Plantago lagopus L. (*Hordeion leporini*)
Plantago lanceolata L. (*Molinio-Arrhenatheretea*)
Plantago leiopetala Lowe (*Sinapidendro angustifolii-Aeonion glutinosi*)

- Plantago loeflingii** L. (*Astragalo sesamei-Poion bulbosae*)
Plantago macrorhiza Poir. (*Crithmo-Limonietea*)
Plantago maderensis Decne. (*Mayteno umbellatae-Oleion maderensis*)
Plantago major L. subsp. **major** (*Plantaginietalia majoris*)
Plantago malato-belizii Lawalree (*Bystropogono punctati-Telinion maderensis*)
Plantago maritima L. (*Juncetea maritimi*)
Plantago monticola (see *Plantago radicata* subsp. *monticola*)
Plantago occidentalis (see *Plantago coronopus* subsp. *occidentalis*)
Plantago radicata Hoffmanns. & Link subsp. **acanthophylla** (Decne.) Franco (*Hieracio castellani-Plantaginion radicatae*)
Plantago radicata Hoffmanns. & Link subsp. **monticola** Franco (*Hieracio castellani-Plantaginion radicatae*)
Plantago radicata Hoffmanns. & Link subsp. **radicata** (*Festucetea indigestae*)
Plantago sempervirens Crantz (*Helichryso stoechadis-Santolinietalia squarrosae*)
Plantago serraria L. (*Plantaginion serrariae*)
Platanthera bifolia (L.) Rich. (*Quercu-Fagetea*)
Platanthera micrantha (Hochst. ex Seub.) Schlecht. (*Lauro azoricae-Juniperetea brevifoliae*)
Platycapnos spicata (L.) Berhn. subsp. **spicata** (*Diplotaxion erucoidis*)
Plumbago europaea L. (*Pegano-Salsoletea*)
Poa angustifolia L. (*Elytrigietalia repentis*)
Poa annua L. (*Polygono arenastri-Poetalia annuae*)
Poa bulbosa L. var. **bulbosa** (*Poetalia bulbosae*)
Poa bulbosa L. var. **vivipara** Koeler (*Poetalia bulbosae*)
Poa infirma Humb., Bonpl. & Kunth (*Polygono arenastri-Poetalia annuae*)
Poa nemoralis L. (*Quercu-Fagetea*)
Poa pratensis L. (*Molinio-Arrhenatheretea*)
Poa supina Schrad. (*Poion supinae*)
Poa trivialis L. subsp. **sylvicola** (Guss.) H. Lindb. (*Molinieta lia caeruleae*)
Poa trivialis L. subsp. **trivialis** (*Molinio-Arrhenatheretea*)
Pohlia wahlenbergii (F. Weber & D. Mohr) A. L. Andrews (*Montio-Cardaminietalia*)
Polycarpon alsinifolium (Biv.) DC. (*Cutandietalia maritimae*)
Polycarpon diphyllosum Cav. L. (*Cutandietalia maritimae*)
Polycarpon tetraphyllum (L.) L. (*Polygono-Poetea annuae*)
Polygala microphylla L. (*Ericion umbellatae*)
Polygala monspeliaca L. (*Brachypodietalia distachyi*)
Polygala serpyllifolia J.A.C. Hossé (*Violion caninae*)
Polygala vulgaris L. (*Violion caninae*)
Polygonatum odoratum (Miller) Druce (*Quercu-Fagetea*)
Polygonum amphibium L. (*Nymphaeion albae*)
Polygonum arenastrum Boreau (*Polygono arenastri-Poetalia annuae*)
Polygonum aviculare L. (*Polygono arenastri-Poetalia annuae*)
Polygonum bellardii All. (*Stellarietea mediae*)
Polygonum bistorta L. (*Calthion palustris*)
Polygonum equisetiforme Sibth. & Sm. (*Nerio-Tamaricetea*)
Polygonum hydropiper L. (*Bidentetalia tripartitae*)
Polygonum lapathifolium L. (*Bidentetalia tripartitae*)
Polygonum maritimum L. (*Euphorbio paraliae-Ammophiletea arundinaceae*)
Polygonum minus Huds. (*Bidention tripartitae*)
Polygonum persicaria L. (*Solano nigri-Polygonetalia convolvuli*)
Polygonum salicifolium Brouss. ex Willd. (*Magno-Caricion elatae*)
Polypodium australe (see *Polypodium cambricum*)
Polypodium azoricum (Vasc.) R. Fern. (*Hymenophyllion tunbrigensis*)
Polypodium cambricum L. (*Polypodion cambrici*)
Polypodium interjectum Shivas (*Anomodonto-Polypodietalia*)
Polypodium macaronesicum Bobrov (*Anomodonto-Polypodietalia*)
Polypodium serratum (see *Polypodium cambricum*)
Polypogon maritimus Willd. (*Hordeion marini*)
Polypogon viridis (Gouan) Breistr. (*Paspalo distichi-Polypogonion viridis*)
Polystichum drepanum (Sw.) C. Presl (*Sibthorpio peregrinae-Clethrion arboreae*)
Polystichum falcinellum (Sw.) C. Presl (*Polysticho falcinellii-Ericion canariensis*)
Polystichum setiferum (Forssk.) Woynar (*Populetalia albae*)
Polystichum x maderensis J.Y. Johnson (*Polysticho falcinellii-Ericion canariensis*)
Populus alba L. (*Populetalia albae*)
Populus nigra L. (*Salici purpureae-Populetea nigrae*)
Populus tremula L. (*Betulo pendulae-Populetalia tremulae*)
Porella obtusata (L.) Pfeiff. (*Polypodion cambrici*)
Porella platyphylla (L.) Pfeiff. (*Anomodonto-Polypodietalia*)
Portulaca oleracea L. (*Chenopodion muralis*)
Potamogeton crispus L. (*Potametea*)
Potamogeton gramineus L. (*Potamion*)
Potamogeton lucens L. (*Potametalia*)
Potamogeton natans L. (*Nymphaeion albae*)
Potamogeton nodosus Poir. (*Ranunculion fluitantis*)
Potamogeton perfoliatus L. (*Potametalia*)
Potamogeton trichoides Cham. & Schlecht. (*Potamion*)
Potamogetum pectinatus L. (*Potametea*)
Potamogetum polygonifolium Pourr. (*Littorelletalia*)
Potentilla anserina L. (*Plantaginietalia majoris*)
Potentilla erecta (L.) Raeusch. var. **erecta** (*Nardetalia strictae*)
Potentilla erecta (L.) Raeusch. var. **herminii** (Ficalho) Cout. (*Genistion micrantho-anglicae*)
Potentilla herminii (see *Potentilla erecta* var. *herminii*)
Potentilla montana Brot. (*Potentillo montanae-Brachypodion rupestris*)
Potentilla neumanniana Rchb. (*Brometalia erecti*)
Potentilla reptans L. (*Plantaginietalia majoris*)
Potentilla rupestris L. (*Sedo albi-Scleranthetea biennis*)
Potentilla sterilis (L.) Garcke (*Fagetalia*)
Prasium majus L. (*Pistacio lentisci-Rhamnetalia alaterni*)
Prasium medium Lowe (*Mayteno umbellatae-Oleion maderensis*)
Primula acaulis (L.) L. (*Quercu-Fagetea*)
Pritzelago alpina (L.) Kunze subsp. **auerswaldii** (Willk.) Greuter & Burdet (*Asplenietea trichomanes*)
Prunella grandiflora (L.) Scholler subsp. **grandiflora** (*Brometalia erecti*)
Prunella grandiflora (L.) Scholler subsp. **pyrenaica** (Gren. & Godron) A. & O. Bolòs (*Linarion triornithophorae*)
Prunella laciniata (L.) L. (*Festuco-Brometea*)
Prunella pyrenaica (see *Prunella grandiflora* subsp. *pyrenaica*)
Prunella vulgaris L. (*Molinio-Arrhenatheretea*)
Prunella x intermedia Link (*Stachyo lusitanicae-Cheirolophenion sempervirentis*)
Prunus avium L. (*Fagetalia sylvaticae*)
Prunus azorica (Hort. ex Mouill.) Rivas Mart., Lousã, Fern. Prieto, Dias, J.C. Costa & Aguiar (*Dryopterido azoricae-Laurion azoricae*)
Prunus hixa Willd. (*Pruno hixae-Lauretalia novocanariensis*)
Prunus insititia L. (*Rhamno-Prunetea*)
Prunus insititioides (see *Prunus spinosa* subsp. *insititioides*)
Prunus lusitanica L. (*Fraxino angustifoliae-Ulmenion minoris*)
Prunus mahaleb L. (*Prunetalia spinosae*)
Prunus novocanariensis (Hort. ex Mouill.) Rivas Mart., Lousã, Fern. Prieto, Dias, J.C. Costa & Aguiar
Prunus padus L. (*Populetalia albae*)
Prunus spinosa L. subsp. **insititioides** (Ficalho & Cout.) Franco (*Rosenion carioti-pouzinii*)

- Prunus spinosa** L. subsp. **spinosa** (*Rhamno-Prunetea*)
Pseudarrhenatherum longifolium (Thore) Rouy (*Daboecion cantabricae*)
Pseudarrhenatherum pallens (Link) J. Holub (*Hyparrhenion sinaicae*)
Pseudognaphalium luteo-album (L.) Hilliard & Burt (Nano-Cyperetalia)
Pseudorlaya minuscula (Pau) Lainz (*Linarion pedunculatae*)
Pseudorlaya pumila (L.) Grande (*Cutandietalia maritimae*)
Psilurus incurvus (Gouan) Schinz & Thell. (*Tuberarietalia guttatae*)
Psoralea americanum (see *Cullen americanum*)
Psoralea bituminosa (see *Bituminaria bituminosa*)
Pteridium aquilinum (L.) Kuntz var. **aquilinum** (*Cytisetes scopario striati*)
Pteris incompleta Cav. (*Pruno hixae-Lauretalia novocanariensis*)
Pteris vittata L. (*Adiantion capilli-veneris*)
Pterocephalus diandrus (Lag.) Lag. (*Tuberarion guttatae*)
Pterogonium gracile (Hedw.) Sm. (*Bartramio strictae-Polypodium cambrici*)
Pterospartum cantabricum (Spach) Willk. (*Daboecion cantabricae*)
Pterospartum lasianthum (Spach) Willk. (*Ericion umbellatae*)
Pterospartum tridentatum (L.) Willk. (*Ericenion umbellatae*)
Puccinellia distans (L.) Parl. (*Glauco-Puccinellietalia*)
Puccinellia iberica H. Lindb. (*Sarcocornienion perennis*)
Puccinellia maritima (Huds.) Parl. (*Glauco-Puccinellietalia*)
Puccinellia rupestris (With.) Fernald & Weath. (*Juncetea maritimi*)
Puccinellia tenuifolia (Boiss. & Reut.) H. Lindb. (*Juncetalia maritimi*)
Pulicaria dysenterica (L.) Bernh. var. **dysenterica** (*Calystegietalia sepium*)
Pulicaria dysenterica (L.) Bernh. var. **ramosissima** Lec. & Lam. (*Holoschoenetalia vulgaris*)
Pulicaria odora (L.) Rchb. (*Quercetea ilicis*)
Pulicaria paludosa Link (*Agrostion pourretii*)
Pulicaria ramosissima (see *Pulicaria dysenterica* var. *ramosissima*)
Pulicaria vulgaris Gaertn. (*Bidentetea tripartitae*)
Pulmonaria longifolia (Bast.) Boreau (*Pulmonario longifoliae-Quercion roboris*)
Pyrus bourgaeana Decne (*Quercion broteroi*)
Pyrus cordata Desv. (*Frangulo alni-Pyrion cordatae*)
Pyrus pyrastrer Aiton (*Populetalia albae*)
Quercus alpestris (see *Quercus faginea* subsp. *alpestris*)
Quercus broteroana (see *Quercus robur* subsp. *broteroana*)
Quercus broteroi (see *Quercus faginea* subsp. *broteroi*)
Quercus canariensis Willd. (*Quercetalia ilicis*)
Quercus coccifera L. subsp. **coccifera** (*Pistacio lentiscii-Rhamnetalia alaterni*)
Quercus coccifera L. subsp. **rivas-martinezii** Capelo & J.C. Costa (*Quercenion rivasmartinezii-suberis*)
Quercus estremadurensis (see *Quercus robur* subsp. *estremadurensis*)
Quercus faginea Lam. subsp. **alpestris** (Boiss.) Maire (*Aceri granatensis-Quercion fagineae*)
Quercus faginea Lam. subsp. **broteroi** (Cout.) A. Camus (*Quercion broteroi*)
Quercus faginea Lam. subsp. **faginea** (*Aceri granatensis-Quercion fagineae*)
Quercus hybrida Brot. (see *Quercus faginea* subsp. *broteroi*)
Quercus lusitanica Lam. (*Quercion lusitanicae*)
Quercus pyrenaica Willd. (*Quercion pyrenaicae*)
Quercus rivas-martinezii (see *Quercus coccifera* subsp. *rivas-martinezii*)
Quercus robur L. subsp. **broteroana** O. Schwartz (*Quercenion robori-pyrenaicae*)
Quercus robur L. subsp. **estremadurensis** (O. Schwartz) A. Camus (*Quercion broteroi*)
Quercus robur L. subsp. **robur** (*Quercio-Fagetea*)
Quercus rotundifolia Lam. (*Quercetalia ilicis*)
Quercus suber L. (*Quercetalia ilicis*)
Quercus x andeganvensis Hy nothosubsp. **subandeganvensis** (A. Camus) Vila-Viçosa, F.M. Vásquez, Meireles & Pinto-Gomes (*Quercion broteroi*)
Quercus x aïrensis Franco & Vasc. (*Quercetalia ilicis*)
Quercus x andeganvensis Hy (*Pulmonario longifoliae-Quercion roboris*)
Quercus x andeganvensis Hy nothosubsp. **henriquesii** (Franco & Vasc.) Rivas Martínez & Sáenz (*Quercenion robori-pyrenaicae*)
Quercus x celtica F. M. Vázquez et al. (*Quercion lusitanicae*)
Quercus x coutinhoi Samp. (*Pulmonario longifoliae-Quercion roboris*)
Quercus x coutinhoi Samp. nothosubsp. **beturica** F.M. Vázquez et al. (*Quercion broteroi*)
Quercus x coutinhoi Samp. nothosubsp. **duriensis** Monteiro-Henriques, J.C. Costa, A. Bellu, T. Vasconcelos & Aguiar comb. & stat. nov. (*Aceri granatensis-Quercion fagineae*)
Quercus x duriensis (see *Quercus x coutinhoi* nothosubsp. *duriensis*)
Quercus x henriquesii (see *Quercus x andeganvensis* nothosubsp. *henriquesii*)
Quercus x marianica C. Vicioso (*Quercenion broteroi*)
Quercus x mixta Villalobos ex Colmeiro (*Quercetalia ilicis*)
Quercus x neomairei A. Camus (*Quercion pyrenaicae*)
Quercus x subandeganvensis (see *Quercus x andeganvensis* nothosubsp. *subandeganvensis*)
Radiola linoides Roth (*Cicendion*)
Ranunculus abnormis Cutanda & Willk. (*Campanulo herminii-Nardion strictae*)
Ranunculus aleae (see *Ranunculus bulbosus* subsp. *aleae*)
Ranunculus arvensis L. (*Centaureetalia cyani*)
Ranunculus bulbifer (see *Ranunculus bulbosus* subsp. *bulbifer*)
Ranunculus bulbosus L. subsp. **bulbifer** (Jord.) Neves (*Brometalia erecti*)
Ranunculus bulbosus L. subsp. **aleae** (Willk.) Rouy & Foucaud (*Molinio arundinacea-Holoschoenion vulgaris*)
Ranunculus bulbosus L. subsp. **cacuminalis** (G. López) Muñoz Garm. (*Campanulo-Nardion strictae*)
Ranunculus bullatus L. (*Poetalia bulbosae*)
Ranunculus bupleuroides Brot. subsp. **bupleuroides** (*Ericenion umbellatae*)
Ranunculus cacuminalis (see *Ranunculus bulbosus* subsp. *cacuminalis*)
Ranunculus carpetanus (see *Ranunculus ollissiponensis* subsp. *carpetanus*)
Ranunculus cortusifolius Willd. (*Pericallion malvifoliae*)
Ranunculus cortusifolius Willd. subsp. **major** (Lowe) Rivas Mart., Capelo, J.C. Costa, Lousã, **Ranunculus cortusifolius** Willd. var. **minor** Lowe (*Polysticho falcinelli-Ericion canariensis*)
Ranunculus ficaria L. subsp. **ficaria** (*Populetalia albae*)
Ranunculus ficaria L. subsp. **ficariiformis** (F.W. Schult.) Rouy & Foucaud (*Populetalia albae*)
Ranunculus ficariiformis (see *Ranunculus ficaria* subsp. *ficariiformis*)
Ranunculus flammula L. (*Molinietalia caeruleae*)
Ranunculus gramineus L. (*Agrostietalia castellanae*)
Ranunculus hederaceus L. (*Ranunculion omiophyllo-hederacei*)
Ranunculus longipes Lange & Cutanda (*Cicendion*)
Ranunculus macrophyllus Desf. (*Molinio arundinacea-Holoschoenion vulgaris*)
Ranunculus major (see *Ranunculus curtisifolius* subsp. *major*)
Ranunculus minor (see *Ranunculus curtisifolius* var. *minor*)
Ranunculus muricatus L. (*Isoeto-Nano-Juncetea*)

- Ranunculus nigrescens** Freyn in Willk. & Lange (*Festucion merinoi*)
- Ranunculus nodiflorus** L. (*Menthion cervinae*)
- Ranunculus ollissiponensis** Pers. subsp. **carpetanus** (Boiss. & Reut.) Rivas Mart. (*Quercenion pyrenaicae*)
- Ranunculus ollissiponensis** Pers. subsp. **ollissiponensis** (*Ori-ganion virentis*)
- Ranunculus oleulecos** Lloyd (*Littorellion uniflorae*)
- Ranunculus omiophyllus** Ten. (*Ranunculion omiophyllo-hederacei*)
- Ranunculus ophioglossifolius** Vill. (*Glycerio-Sparganion*)
- Ranunculus paludosus** Poir. (*Poetalia bulbosae*)
- Ranunculus parviflorus** L. (*Cardaminetea hirsutae*)
- Ranunculus peltatus** Schrank (*Ranunculion aquatilis*)
- Ranunculus penicillatus** (Dumort.) Bab. (*Ranunculion flui-tantis*)
- Ranunculus pseudofluitans** (Syme) Newbould ex Backer & Foggitt (*Ranunculion fluitantis*)
- Ranunculus repens** L. (*Plantaginetalia majoris*)
- Ranunculus saniculifolius** Viv. (*Ranunculion aquatilis*)
- Ranunculus sceleratus** L. (*Bidentetalia tripartitae*)
- Ranunculus trichophyllus** Chaix (*Ranunculion aquatilis*)
- Ranunculus trilobus** Desf. (*Cypero micheliani-Ranunculetum trilobi*)
- Ranunculus tripartitus** DC. (*Ranunculion aquatilis*)
- Raphanus raphanistrum** L. (*Stellarienea mediae*)
- Rapistrum linnaeanum* (see *Rapistrum rugosum* subsp. *linnaeanum*)
- Rapistrum rugosum** (L.) All. subsp. **linnaeanum** Rouy & Fouc. (*Centaureetalia cyani*)
- Rapistrum rugosum** (L.) All. subsp. **rugosum** (*Centaureeta-lia cyani*)
- Reboulia hemisphaerica** (L.) Raddi (*Bartramio strictae-Poly-podion cambrici*)
- Reichardia gaditana** (Will.) Cout. (*Linario polygalifoliae-Vulpion alopecuoris*)
- Reichardia intermedia** (Sch. Bip.) Cout. (*Echio plantaginei-Galactition tomentosae*)
- Reichardia picroides** (L.) Roth (*Thero-Brometalia*)
- Reseda alba** L. subsp. **alba** (*Hordeion leporini*)
- Reseda barrelieri** Bertol. ex Müll. Arg. in DC. subsp. **barre-lieri** (*Carthametalia lanati*)
- Reseda gredensis** (Cutanda & Willk.) Müll Arg. in DC. (*Lina-rio saxatilis-Senecionion carpetani*)
- Reseda lutea** L. subsp. **lutea** (*Artemisietea vulgaris*)
- Reseda luteola** L. (*Onopordenea acanthi*)
- Reseda media** Lag. (*Sesamoidion suffruticosa*)
- Reseda phyteuma** L. (*Solano-Polygonetalia convolvuli*)
- Reseda virgata** Boiss. & Reut. (*Hieracio castellani-Plantagi-nion radicatae*)
- Retama monosperma** (L.) Boiss. (*Retamion monospermae*)
- Retama sphaerocarpa** (L.) Boiss. (*Cytisetetea-scopario striati*)
- Rhagadiolus edulis** Gaertn. (*Geranio purpurei-Cardamineta-lia hirsutae*)
- Rhagadiolus stellatus** (L.) Gaertn. subsp. **stellatus** (*Chenopo-dio-Stellarienea*)
- Rhamnus alaternus** L. subsp. **alaternus** f. **alaternus** (*Quer-cetea ilicis*)
- Rhamnus alaternus** L. subsp. **alaternus** f. **neoparvifolia** Rivas-Martínez & J.M. Pizarro (*Pistacio lentisci-Rhamneta-lia alaterni*)
- Rhamnus catharticus** L. (*Prunetalia spinosae*)
- Rhamnus glandulosa** Aiton (*Pruno hixae-Lauretea novocana-riensis*)
- Rhamnus laderoi* (see *Rhamnus lycioides* subsp. *laderoi*)
- Rhamnus lycioides** L. subsp. **laderoi** Rivas Mart. & Pizarro (*Pistacio lentisci-Rhamneta-lia alaterni*)
- Rhamnus oleoides** L. (*Asparago albi-Rhamnion oleoidis*)
- Rhinanthus minor** L. (*Molinio-Arrhenatheretea*)
- Rhododendron ponticum** L. (*Arbuto unedonis-Laurion nobilis*)
- Rhynchospora alba** (L.) Vahl (*Rhynchosporion albae*)
- Rhynchospora modesti-lucennoi** Castrov. (*Eleocharition mul-ticaulis*)
- Riccia beyrichiana** Hampe ex Lehm. (*Isoetion*)
- Riccia bifurca** Hoffm. (*Isoetion*)
- Riccia ciliifera** Link ex Lindenb. (*Isoetion*)
- Riccia crystallina** L. (*Nano-Cyperetalia*)
- Ricinia communis** L. (*Nicotiano glauci-Ricinion communis*)
- Ridolfia segetum** Moris (*Ridolfion segeti*)
- Romulea bulbocodium** (L.) Sebastiani & Mauri subsp. **bulbo-codium** (*Poetea bulbosae*)
- Romulea gaditana* (see *Romulea ramiflora* subsp. *gaditana*)
- Romulea ramiflora** Ten. subsp. **gaditana** (G. Kuntz) Marais (*Malcolmietalia*)
- Romulea ramiflora** Ten. subsp. **ramiflora** (*Poetalia bulbosae*)
- Rorippa amphibia** (L.) Besser (*Magno-Carici elatae-Phrag-mitetea australis*)
- Rorippa nasturtium-aquaticum** (L.) Hayek (*Rorippion nas-turtii-aquatici*)
- Rorippa palustris** (L.) Besser (*Bidentetalia tripartitae*)
- Rorippa sylvestris** (L.) Besser (*Agrostion stoloniferae*)
- Rosa agrestis** Savi (*Prunetalia spinosae*)
- Rosa andegavensis** Bastard (*Pruno-Rubion ulmifolii*)
- Rosa arvensis** Huds. (*Quercu-Fagetea*)
- Rosa canina** L. (*Rhamno-Prunetea*)
- Rosa corymbifera** Borkh. (*Prunetalia spinosae*)
- Rosa deseglisei** Boeau (*Rosenion carioti-pouzinii*)
- Rosa mandonii** Desegl. (*Sibthorpio peregrinae-Clethrion arboreae*)
- Rosa micrantha** Borrer ex Sm. (*Pruno-Rubion ulmifolii*)
- Rosa nitidula** Besser (*Prunetalia spinosae*)
- Rosa pouzinii** Tratt. (*Pruno-Rubion ulmifolii*)
- Rosa sempervirens** L. (*Quercetalia ilicis*)
- Rosa squarrosa** (A. Rau) Borreau (*Prunetalia spinosae*)
- Rosa stylosa** Desv. (*Prunetalia spinosae*)
- Rosa tomentosa** Sm. (*Prunetalia spinosae*)
- Rosa villosa** L. (*Prunetalia spinosae*)
- Rosa vosiagiaca** Desp. (*Prunetalia spinosae*)
- Rosmarinus officinalis** L. (*Rosmarinetea officinalis*)
- Rosmarinus palaui** (Bolòs & Molin.) Rivas-Mart. & M.J. Costa (*Rosmarinetalia officinalis*)
- Rostraria azorica** Henderson (*Ornithopo pinnatae-Gaudinion coarctatae*)
- Rostraria cristata** (L.) Tzvelev (*Hordeion leporini*)
- Rotala indica** (Willk.) Kohne (*Oryzo sativae-Echinochloion oryzoides*)
- Rubia agostinhoi** Dans. & P. Silva (*Quercu rotundifoliae-Oleion sylvestris*)
- Rubia fruticosa** Aiton subsp. **fruticosa** (*Rhamno crenulatae-Oleetea cerasiformis*)
- Rubia fruticosa** Aiton subsp. **melanocarpa** (Bornm.) Bram-well (*Kleinio-Euphorbietea canariensis*)
- Rubia longifolia* (see *Rubia peregrina* subsp. *longifolia*)
- Rubia melanocarpa* (see *Rubia fruticosa* Aiton subsp. *melano-carpa*)
- Rubia peregrina** L. subsp. **longifolia** (Poir.) O. Bolòs (*Quer-cetea ilicis*)
- Rubia peregrina** L. subsp. **peregrina** (*Quercetea ilicis*)
- Rubia tinctorum** L. (*Balloto-Conion maculati*)
- Rubus bollei** Focke (*Rubio periclymeni-Rubion ulmifolii*)
- Rubus brigantinus** Samp. (*Lonicero periclymeni-Rubenion ulmifolii*)
- Rubus caesius** L. (*Rhamno-Prunetea*)
- Rubus canescens** DC. (*Prunetalia spinosae*)
- Rubus castellarnau** Pau (*Rosenion carioti-pouzinii*)
- Rubus cintranus* (see *Rubus henriquesii* subsp. *cintranus*)
- Rubus corylifolius* (see *Rubus lainzii*)
- Rubus grandifolius** Lowe (*Sibthorpio peregrinae-Clethrion arboreae*)
- Rubus henriquesii** Samp. subsp. **cintranus** (*Rosenion carioti-pouzinii*)

- Rubus henriquesii** Samp. subsp. **henriquesii** (Cout.) Franco (*Lonicero periclymeni-Rubion ulmifolii*)
- Rubus hochstetterum** Seub. (*Ericetalia azoricae*)
- Rubus lainzii** H.E. Weber (*Prunetalia spinosae*)
- Rubus radula** Weihe ex Boenn Kalt (*Prunetalia spinosae*)
- Rubus sampaioanus** Sudre ex Samp. (*Frangulo alni-Pyrion cordatae*)
- Rubus ulmifolius** Schott (*Pruno-Rubion ulmifolii*)
- Rubus vigoii** Roselló, Peris & Stübing (*Prunetalia spinosae*)
- Rumex acetosa** L. subsp. **acetosa** (*Molinio-Arrhenatheretea*)
- Rumex acetosella** L. (*Sedo albi-Scleranthea biennis*)
- Rumex angiocarpus** Murb. L. (*Agrostietalia castellanae*)
- Rumex azoricus** Rech. f. (*Tolpido azoricae-Holcetea rigidi*)
- Rumex bucephalophorus** L. subsp. **bucephalophorus** (*Tuberarietalia guttatae*)
- Rumex bucephalophorus** L. subsp. **canariensis** (Steinh.) Rech.f. (*Tuberarion guttatae*)
- Rumex bucephalophorus** L. subsp. **fruticescens** Bornm. (*Deschampsio maderensis-Parafestucion albidae*)
- Rumex bucephalophorus** L. subsp. **gallicus** (Steinh.) Rech. f. (*Tuberarietalia guttatae*)
- Rumex bucephalophorus** L. subsp. **hispanicus** (Steinh.) Rech. f. (*Malcolmietalia*)
- Rumex canariensis* (see *Rumex bucephalophorus* subsp. *canariensis*)
- Rumex conglomeratus** Murray (*Plantaginetalia majoris*)
- Rumex crispus** L. (*Plantaginetalia majoris*)
- Rumex fruticescens* (see *Rumex bucephalophorus* subsp. *fruticescens*)
- Rumex gallicus* (see *Rumex bucephalophorus* subsp. *gallicus*)
- Rumex hispanicus* (see *Rumex bucephalophorus* subsp. *hispanicus*)
- Rumex induratus** Boiss. & Reut. (*Phagnalo saxatilis-Rumicetalia indurati*)
- Rumex intermedius** D.C. subsp. **lusitanicus** Franco (*Calendulo lusitanicae-Antirrhinion linkiani*)
- Rumex lusitanicus* (see *Rumex intermedius* subsp. *lusitanicus*)
- Rumex maderensis** Lowe (*Ranunculo cortusifolii-Geranion canariensis*)
- Rumex obtusifolius** L. (*Plantaginetalia majoris*)
- Rumex papillaris** Boiss. & Reut. (*Agrostietalia castellanae*)
- Rumex pulcher** L. subsp. **pulcher** (*Sisymbrietalia officinalis*)
- Rumex pulcher** L. subsp. **woodsii** (De Not.) Arcang. (*Hordeion leporini*)
- Rumex roseus** L. (*Malcolmietalia*)
- Rumex suffruticosus** J. Gay ex Willk. (*Linario saxatilis-Senecionion carpetani*)
- Rumex woodsii* (see *Rumex pulcher* subsp. *woodsii*)
- Ruppia cirrhosa** (Petagna) Grande (*Ruppion maritimae*)
- Ruppia maritima** L. (*Ruppion maritimae*)
- Ruscus aculeatus** L. (*Quercetalia ilicis*)
- Ruscus streptophyllus** Yeo (*Sibthorpio peregrinae-Clethron arboreae*)
- Ruta angustifolia** Pers. (*Pegano-Salsoletea*)
- Ruta chalepensis** L. (*Rosmarinetalia officinalis*)
- Ruta montana** (L.) L. (*Helichryso stoechadis-Santolinetalia squarrosae*)
- Saccogyna viticulosa** (L.) Dumort. (*Hymenophyllion tunbrigensis*)
- Sagina apetala** Ard. (*Polygono arenastri-Poetalia annuae*)
- Sagina maritima** G. Don (*Saginetea maritimae*)
- Sagina nodosa** (L.) Fenzl (*Saginion maritimae*)
- Sagina procumbens** L. (*Saginion procumbentis*)
- Sagittaria sagittifolia** L. (*Phragmitetalia*)
- Salicornia fragilis** P.W. Ball & Tutin (*Salicornion dolichostachyo-fragilis*)
- Salicornia patula** Duval-Juve (*Salicornion trilobae*)
- Salicornia ramosissima** J. Woods (*Salicornion europaeo-ramosissima*)
- Salix alba** L. (*Salicetalia purpureae*)
- Salix arenaria* (see *Salix repens* subsp. *arenaria*)
- Salix argentea* (see *Salix repens* subsp. *arenaria*)
- Salix atrocinerea** Brot. (*Populetales albae*)
- Salix australis* (see *Salix salviifolia* Brot. *australis*)
- Salix canariense** Ch.P.Sm. ex Link (*Salicion canariensis*)
- Salix caprea** L. (*Betulo pendulae-Populetales tremulae*)
- Salix discolor* (see *Salix triandra* subsp. *discolor*)
- Salix fragilis** L. (*Salicetalia purpureae*)
- Salix lambertiana* (see *Salix purpurea* subsp. *lambertiana*)
- Salix neotricha** Goerz (*Populenion albae*)
- Salix pedicellata** Desf. (*Salicetalia purpureae*)
- Salix purpurea** L. subsp. **lambertiana** (Sm.) A. Neumann ex Rech. fil. (*Salicetalia purpureae*)
- Salix repens** L. subsp. **arenaria** (L.) Hiitonen (*Salicetalia arenariae*)
- Salix repens** L. subsp. **repens** (*Scheuchzerio palustris-Caricetea nigrae*)
- Salix salviifolia** Brot. subsp. **australis** Franco (*Salicion salviifoliae*)
- Salix salviifolia** Brot. subsp. **salviifolia** (*Salicion salviifoliae*)
- Salix triandra** L. subsp. **discolor** (Koch) Arcangeli (*Salicetalia purpureae*)
- Salix x multidentata** T.E. Díaz & Llamas (*Salicetalia purpureae*)
- Salix x pseudosalviifolia** T.E. Díaz & Llamas (*Salicion salviifoliae*)
- Salix x rubens** Schrank. (*Salicetalia purpureae*)
- Salix x secalliana** Pau & C. Vicioso (*Salicion salviifoliae*)
- Salpichroa organifolia** (Lam.) Baillon (*Nicotiano glauci-Ricinion communis*)
- Salsola kali** L. subsp. **kali** (*Cakiletea maritimae*)
- Salsola soda** L. (*Thero-Suaedion*)
- Salsola vermiculata** L. subsp. **vermiculata** (*Salsolo vermiculatae-Peganetalia harmalae*)
- Salvia aethiopis** L. (*Artemisietalia vulgaris*)
- Salvia argentea** L. (*Carthametalia lanati*)
- Salvia sclareoides** Brot. (*Brachypodion phoenicoidis*)
- Salvia verbenaca** L. subsp. **verbenaca** (*Artemisietea vulgaris*)
- Salvia viridis** L. (*Cerintho majoris-Fedion cornucopiae*)
- Sambucus ebulus** L. (*Balloto-Conion maculati*)
- Sambucus lanceolata** R. Br. (*Sibthorpio peregrinae-Clethron arboreae*)
- Sambucus nigra** L. (*Rhamno-Prunetea*)
- Sanguisorba ancistroides** (Desf.) Ces. (*Asplenietalia petrarachae*)
- Sanguisorba hybrida** (L.) Font Quer (*Quercenion broteroi*)
- Sanguisorba minor** Scop. subsp. **minor** (*Festuco-Brometea*)
- Sanguisorba rupicola** (Boiss. & Reut.) A. Braun & C.D. Bouché (*Asplenietea trichomanes*)
- Sanguisorba verrucosa** (Link ex G. Don) Ces. (*Stipo-Agrostietea castellanae*)
- Sanicula azorica** Guthnick ex Seub. (*Dryopterido azoricae-Laurion azoricae*)
- Sanicula europaea** L. (*Quercu-Fagetea*)
- Santolina impressa** Hoffmann. & Link (*Artemisio glutinosae-Santolinion rosmarinifoliae*)
- Santolina rosmarinifolia** L. subsp. **rosmarinifolia** (*Artemisio glutinosae-Santolinion rosmarinifoliae*)
- Santolina rosmarinifolia** L. subsp. **semidentata** (Hoffmanns. & Link) Valdés Berm. (*Artemisio glutinosae-Santolinion rosmarinifoliae*)
- Santolina semidentata* (see *Santolina rosmarinifolia* subsp. *semidentata*)
- Saponaria officinalis** L. (*Salici purpureae-Populetea nigrae*)
- Sarcocornia alpini** (Lag.) Rivas Mart. (*Sarcocornion alpini*)
- Sarcocornia fruticosa** (L.) A.J. Scott (*Sarcocornion fruticosae*)
- Sarcocornia perennis** (Mill.) A.J. Scott subsp. (*Sarcocornion perennis*)

- Satureja graeca** L. var. **micrantha** (Brot.) Briq. (*Saturejo-Thymbrion capitatae*)
- Saxifraga cintrana** Willk. (*Calendulo lusitanicae-Antirrhinion linkiani*)
- Saxifraga continentalis* (see *Saxifraga fragosoi*)
- Saxifraga fragosoi** Sennen (*Saxifragion fragosoi*)
- Saxifraga granulata** L. (*Phagnalo saxatilis-Rumicetalia indurati*)
- Saxifraga lepismigenae** Planellas (*Caricion remotae*)
- Saxifraga maderensis** D. Don var. **maderensis** (*Sinapidendro angustifolii-Aeonion glutinosi*)
- Saxifraga maderensis** D. Don var. **pickeringii** (C. Simón) D.A. Webb & Press (*Sinapidendro angustifolii-Aeonion glutinosi*)
- Saxifraga portosanctana** Boiss. (*Davallio canariensis-Saxifragetum portosanctanae*)
- Saxifraga spathularis** Brot. (*Quercetalia roboris*)
- Saxifraga tridactylites** L. (*Brachypodietalia distachyi*)
- Scabiosa atropurpurea** L. (*Bromo-Piptatherion miliacei*)
- Scabiosa columbaria** L. subsp. **columbaria** (*Festuco-Brometea*)
- Scabiosa nitens** Roem. & Schult. (*Tolpido azoricae-Holcetea rigidi*)
- Scabiosa stellata** L. subsp. **simplex** (Desf.) Coult.
- Scabiosa stellata** L. subsp. **stellata** (*Brachypodietalia distachyi*)
- Scandix australis** L. (*Brachypodietalia distachyi*)
- Scandix pecten-veneris** L. (*Centaureetalia cyani*)
- Scapania undulata** (L.) Dumort. (*Montio-Cardaminetalia*)
- Schizogyne sericea** (L.f.) DC. (*Forsskaoleo angustifoliae-Rumicetalia lunariae*)
- Schoenoplectus lacustris** (L.) Palla (*Phragmitetalia*)
- Schoenoplectus litoralis** (Schrader) Palla (*Bolboschoenion compacti*)
- Schoenoplectus mucronatus** (L.) Palla (*Oryzo sativae-Echinochloion oryzoides*)
- Schoenoplectus pungens** (Vahl) Palla (*Magno-Carici elatae-Phragmitetea australis*)
- Schoenoplectus supinus** (L.) Palla (*Oryzetea sativae*)
- Schoenoplectus tabernaemontani** (C.C. Gmelin) Palla (*Phragmitetalia*)
- Schoenus nigricans** L. (*Molinio-Arrhenatheretea*)
- Scilla autumnalis** L. (*Poetea bulbosae*)
- Scilla madeirensis** Menezes var. **madeirensis** (*Mayteno umbellatae-Oleion maderensis*)
- Scilla madeirensis** Menezes var. **meliiodora** Svent. (*Kleinio-Euphorbietea canariensis*)
- Scilla meliiodora* (see *Scilla madeirensis* var. *meliiodora*)
- Scilla monophyllos** Link (*Quercu rotundifoliae-Oleion sylvestris*)
- Scilla odorata** Link (*Hymenocarpo hamosi-Malcolmion trilobae*)
- Scilla verna** Huds. (*Nardetea strictae*)
- Scirpoides holoschoenus** (L.) Soják subsp. **australis** (Murray) Soják (*Brizo-Holoschoenenion*)
- Scirpoides holoschoenus** (L.) Soják subsp. **holoschoenus** (*Holoschoenetalia vulgaris*)
- Scirpus fluitans* (see *Eleogiton fluitans*)
- Scirpus holoschoenus* subsp. *australis* (see *Scirpoides holoschoenus* subsp. *australis*)
- Scirpus holoschoenus* subsp. *holoschoenus* (see *Scirpoides holoschoenus* subsp. *holoschoenus*)
- Scirpus lacustris* (see *Schoenoplectus lacustris*)
- Scirpus litoralis* (see *Schoenoplectus litoralis*)
- Scirpus maritimus* var. *compactus* (see *Bolboschoenus maritimus* var. *compactus*)
- Scirpus maritimus* var. *maritimus* (see *Bolboschoenus maritimus* var. *maritimus*)
- Scirpus mucronatus* (see *Schoenoplectus mucronatus*)
- Scirpus pungens* (see *Schoenoplectus pungens*)
- Scirpus tabernaemontani* (see *Schoenoplectus tabernaemontani*)
- Scleranthus annuus** L. (*Scleranthion annui*)
- Scleranthus delortii** Gren. in F.W. Schultz (*Tuberarion guttatae*)
- Scleranthus perennis** L. (*Sedo albi-Scleranthetea biennis*)
- Scleranthus polycarpus** L. (*Tuberarietea guttatae*)
- Scleranthus verticillatus** Tausch. (*Tuberarietea guttatae*)
- Scolymus hispanicus** L. (*Carthametalia lanati*)
- Scolymus maculatus** L. (*Onopordion castellani*)
- Scorpiurus muricatus** L. (*Tuberarietea guttatae*)
- Scorpiurus vermiculatus** L. (*Poetalia bulbosae*)
- Scorzonera angustifolia** (*Brachypodietalia phoenicoidis*)
- Scorzonera crispatula* (see *Scorzonera hispanica* subsp. *crispatula*)
- Scorzonera fistulosa** Brot. (*Juncion acutiflori*)
- Scorzonera hispanica** L. subsp. **crispatula** (Boiss.) Nyman (*Rosmarinetalia officinalis*)
- Scorzonera humilis** L. (*Calluno-Ulicetea*)
- Scorzonera laciniata** L. (*Thero-Brometalia*)
- Scorzonera transtagana** Cout. (*Quercion lusitanicae*)
- Scrophularia auriculata** Loefl. ex L. (*Calystegietalia sepium*)
- Scrophularia balbisii** Hoernem. subsp. **balbisii** (*Bromo ramosi-Eupatorion cannabini*)
- Scrophularia canina** L. subsp. **canina** (*Andryaetalia ragusinae*)
- Scrophularia frutescens** L. (*Crucianelletalia maritimae*)
- Scrophularia grandiflora** DC. (*Smyrnienion olusatri*)
- Scrophularia herminii** Hoffmans & Link (*Arction lappae*)
- Scrophularia hirta** Lowe (*Salicion canariensis*)
- Scrophularia montana* (see *Scrophularia schousboei* subsp. *montana*)
- Scrophularia peregrina** L. (*Smyrnienion olusatri*)
- Scrophularia racemosa** Lowe (*Salicion canariensis*)
- Scrophularia schousboei** Lange subsp. **schousboei** (*Rumici-Dianthion lusitani*)
- Scrophularia schousboei** Lange subsp. **montana** Franco (*Hieracio-Plantaginion radicatae*)
- Scrophularia scorodonia** L. (*Osmundo-Alnion*)
- Scrophularia sublyrata** Brot. (*Brassicion oleraceae*)
- Scrophularia valdesii** Ortega Oliv. & Devesa (*Rumici-Dianthion lusitani*)
- Scutellaria galericulata** L. (*Alnetea glutinosae*)
- Scutellaria minor** Huds. (*Juncion acutiflori*)
- Securinega tinctoria* (see *Flueggea tinctoria*)
- Sedum acre** L. (*Sedo albi-Scleranthetea biennis*)
- Sedum album** L. (*Sedo albi-Scleranthetea biennis*)
- Sedum amplexicaule** DC. (*Sedo albi-Scleranthetea biennis*)
- Sedum andegavense** (DC.) Desv. (*Sedion pedicellato-andegavensis*)
- Sedum anglicum** Hudson subsp. **anglicum** (*Sedion anglici*)
- Sedum anglicum** Hudson subsp. **pyrenaicum** (Lange) Lainz (*Sedion pyrenaici*)
- Sedum arenarium** Brot. (*Sedion pedicellato-andegavensis*)
- Sedum brevifolium** DC. (*Sedo albi-Scleranthetea biennis*)
- Sedum brissemoretii** Raym.-Hamet (*Sinapidendro angustifolii-Aeonion glutinosi*)
- Sedum caespitosum** (Cav.) DC. (*Sedion caespitosi*)
- Sedum farinosum** Lowe (*Sinapidendro angustifolii-Aeonion glutinosi*)
- Sedum forsterianum** Sm. (*Quercu-Fagetea*)
- Sedum fusiforme** Lowe (*Sinapidendro angustifolii-Aeonion glutinosi*)
- Sedum hirsutum** All. subsp. **hirsutum** (*Phagnalo saxatilis-Rumicetalia indurati*)
- Sedum maireanum** Sennen (*Cicendion*)
- Sedum mucizonia** (Ortega) Raym.-Hamet (*Phagnalo-Rumicetalia indurati*)
- Sedum nudum** Aiton (*Sinapidendro angustifolii-Aeonion glutinosi*)

- Sedum pedicellatum** Boiss. & Reut. (*Sedion pedicellato-andegavensis*)
Sedum pedicellatum subsp. *lusitanicum* (see *Sedum willkommianum*)
- Sedum pruinaum** Brot. (*Sedion anglici*)
Sedum pyrenaicum (see *Sedum anglicum* subsp. *pyrenaicum*)
- Sedum rubens** L. (*Tuberarietea guttatae*)
- Sedum sediforme** (Jacq.) Pau (*Sedion micrantho-sediformis*)
- Sedum tenuifolium** (Sibth & Sm.) Strobl (*Sedo albi-Scleranthetea biennis*)
- Sedum willkommianum** R. Fern. (*Sedion pedicellato-andegavensis*)
- Selaginella azorica** Spring (*Thelypterido pozoi-Woodwardion radicantis*)
- Selaginella denticulata** (L.) Spring (*Anomodonto-Polypodietalia*)
- Selaginella kraussiana** (G. Kunze) A. Br. (*Selaginello denticulatae-Anogrammion leptophyllae*)
- Selinum broteri** Hoffmann. & Link (*Selino broteri-Molinietum caeruleae*)
- Semele androgyna** (L.) Kunth (*Visneo mocanerae-Apollonion barbujanae*)
- Senecio aquaticus** Hill (*Molinietalia caeruleae*)
Senecio caespitosus (see *Senecio pyrenaicus* subsp. *caespitosus*)
Senecio foliosus (see *Senecio jacobea* var. *foliosus*)
- Senecio gallicus** Vill. in Chaix. (*Thero-Brometalia*)
- Senecio incrassatus** Lowe (*Mesembryanthemion crystallini*)
- Senecio jacobea** L. (*Molinio-Arrhenatheretea*)
- Senecio jacobea** L. var. **foliosus** (Salzm. ex DC.) Cout. (*Senecio foliosae-Phalaridetum coerulescentis*)
- Senecio lividus** L. (*Chenopodio-Stellarienea*)
- Senecio lopezii** Boiss. (*Quercion broteroi*)
- Senecio minutus** (Cav.) DC. (*Tuberarion guttatae*)
- Senecio pyrenaicus** L. subsp. **caespitosus** (Brot.) Franco (*Linario saxatilis-Senecionion carpetani*)
- Senecio sylvaticus** L. (*Carici piluliferae-Epilobion angustifolii*)
- Senecio vulgaris** L. (*Stellarietea mediae*)
- Serapias cordigera** L. (*Juncion acutiflori*)
- Serapias lingua** L. (*Agrostietalia castellanae*)
- Serapias parviflora** Parl. (*Agrostietalia castellanae*)
- Serapias vomeracea** (Burm.) Briq. (*Brizo-Holoschoenenion*)
- Serratula alcalae** Cosson subsp. **aristata** Franco (*Quercion lusitanicae*)
Serratula algarbiensis (see *Serratula monardii* var. *algarbiensis*)
Serratula aristata (see *Serratula alcalae* subsp. *aristata*)
- Serratula baetica** Boiss. & DC. subsp. **lusitanica** Cantó (*Saturejo-Thymbrion capitatae*)
- Serratula estremadurensis** Franco (*Ulici densi-Thymion sylvestris*)
- Serratula flavescens** (L.) Poir. subsp. **leucantha** (Cav.) Cantó & M.J. Costa (*Rosmarinetalia officinalis*)
Serratula leucantha (see *Serratula flavescens* subsp. *leucantha*)
Serratula lusitanica (see *Serratula baetica* subsp. *lusitanica*)
- Serratula monardii** Dufour var. **algarbiensis** Cantó (*Quercion lusitanicae*)
- Serratula monardii** Dufour var. **monardii** (*Quercion lusitanicae*)
- Serratula pinnatifida** (Cav.) Poir. (*Rosmarinetalia officinalis*)
Serratula seoanei (see *Serratula tinctoria* var. *seoanei*)
- Serratula tinctoria** L. var. **seoanei** (Willk.) Lainz (*Violion caninae*)
- Sesamoides latifolia* (see *Sesamoides suffruticosa* subsp. *latifolia*)
- Sesamoides purpurascens** (L.) G. López (*Jasiono sessiliflorae-Koelerietalia crassipedis*)
- Sesamoides spathulifolia** (Relevière ex Boreau) Rothm. (*Corynephorion maritimi*)
- Sesamoides suffruticosa** (Lange) Kuntz subsp. **latifolia** (Merino) Rivas Mart. (*Crithmo-Armerion maritimae*)
- Sesamoides suffruticosa** (Lange) Kuntz subsp. **suffruticosa** (*Sesamoidion suffruticosae*)
- Seseli peixoteanum** Samp. (*Armerion eriophyllae*)
- Seseli tortuosum** L. (*Crucianelletalia maritimae*)
- Setaria pumila** (Poir.) Roem. & Schult. (*Polygono-Chenopodion polyspermi*)
- Setaria verticillata** (L.) P. Beauv. (*Solano nigri-Polygonetalia convolvuli*)
- Setaria viridis** (L.) P. Beauv. (*Solano nigri-Polygonetalia convolvuli*)
- Sherardia arvensis** L. (*Centaureetalia cyani*)
- Sibthorpia europaea** L. (*Caricion remotae*)
- Sibthorpia peregrina** L. (*Sibthorpio peregrinae-Clethrion arboreae*)
- Sideritis algarbiensis** Obón & Rivera subsp. **algarbiensis** (*Eryngio-Ulicenion erinacei*)
- Sideritis algarbiensis** Obón & Rivera subsp. **lusitanica** (Font Quer) Rivas Mart., T.E. Díaz & Fern. Gonz. (*Saturejo-Thymbrion capitatae*)
- Sideritis bubanii** Font Quer (*Sideritido incanae-Salvion lavandulifoliae*)
- Sideritis candicans** Aiton var. **candicans** (*Bystropogono punctatitelinion maderensis*)
- Sideritis candicans** Aiton var. **multiflora** (Bornm.) Mend.-Heur (*Mayteno umbellatae-Oleion maderensis*)
Sideritis chamaedrifolia Hoffmann. & Link (see *Sideritis hirsuta* subsp. *hirtula*)
Sideritis hirsuta var. *hirtula* (see *Sideritis hirsuta* subsp. *hirtula*)
- Sideritis hirsuta** L. subsp. **hirtula** (Brot.) P. Silva (*Ulici densi-Thymion sylvestris*)
- Sideritis hirsuta** L. subsp. **hirsuta** (*Helichryso stoechadis-Santolinetalia squarrosae*)
Sideritis hirtula (see *Sideritis hirsuta* subsp. *hirtula*)
Sideritis lusitanica (see *Sideritis algarbiensis* subsp. *lusitanica*)
Sideritis multiflora (see *Sideritis candicans* var. *multiflora*)
- Sideritis romana** L. (*Brachypodietalia distachyi*)
- Sideroxylon mirmulans** R. Br. (*Visneo mocanerae-Apollonion barbujanae*)
- Silene acutifolia** Link ex Rohrb. (*Saxifragion willkommiana*)
- Silene boryi** Boiss. subsp. **duriensis** (Samp.) Cout. (*Xero-Aphyllanthenion*)
- Silene ciliata** Pourr. subsp. **elegans** (Link ex Brot.) Rivas Mart. (*Festucetalia curvifoliae*)
- Silene colorata** Poir. (*Tuberarietea guttatae*)
- Silene conica** L. (*Tuberarietea guttatae*)
- Silene coutinhoi** Rothm. & P. Silva (*Linaron triornithophorae*)
- Silene dioica** (L.) Clairv. (*Galio-Alliarion petiolatae*)
Silene duriensis (see *Silene boryi* subsp. *duriensis*)
Silene elegans (see *Silene ciliata* subsp. *elegans*)
- Silene foetida** Link subsp. **foetida** (*Linario saxatilis-Senecionion carpetani*)
- Silene fuscata** Link ex Brot. (*Echio plantaginei-Galactition tomentosae*)
- Silene gallica** L. (*Thero-Brometalia*)
- Silene gracilis** DC. (*Hymenocarpo hamosi-Malcolmion trilobae*)
- Silene inaperta** L. subsp. **inaperta** (*Andryaetalia ragusinae*)
- Silene laeta** (Aiton) Godron (*Juncion acutiflori*)
- Silene latifolia** Poir. (*Trifolio medii-Geranietea sanguinei*)
- Silene legionensis** Lag. (*Hieracio-Plantaginion radicatae*)
- Silene littorea** Brot. subsp. **littorea** (*Linaron pedunculatae*)
- Silene longicaulis** Pourr. ex Lag. (*Linario polygalifoliae-Vulpion alopecuroris*)
- Silene longicilia** (Brot.) Otth in DC. (*Calendulo lusitanicae-Antirrhinion linkiani*)
- Silene marizii** Samp. (*Rumici-Dianthion lusitani*)

- Silene mellifera** Boiss. & Reuter subsp. **mellifera** (*Origanion virentis*)
- Silene micropetala** Lag. (*Malcolmietalia*)
- Silene muscipula** L. (*Centaureetalia cyani*)
- Silene nicaeensis** All. (*Cutandietalia maritimae*)
- Silene nocturna** L. (*Centaureetalia cyani*)
- Silene nutans** L. (*Trifolio medii-Geranietea sanguinei*)
- Silene obtusifolia** Willd. (*Crithmo-Daucion halophili*)
- Silene portensis** L. (*Tuberarietalia guttatae*)
- Silene psammitis** Link ex Spreng. subsp. **psammitis** (*Tuberarietalia guttatae*)
- Silene ramosissima** Desf. L. (*Cutandietalia maritimae*)
- Silene rothmaleri** P. Silva (*Astragalion tragacanthae*)
- Silene rubella** L. (*Centaureetalia cyani*)
- Silene scabriflora** Brot. subsp. **scabriflora** (*Tuberarietalia guttatae*)
- Silene scabriflora** Brot. subsp. **tuberculata** (Ball) Talavera (*Echio plantaginei-Galactition tomentosae*)
- Silene sclerocarpa** Dufour (*Malcolmietalia*)
- Silene stricta** L. (*Ridolfion segeti*)
- Silene tuberculata* (see *Silene scabriflora* subsp. *tuberculata*)
- Silene uniflora** Roth subsp. **uniflora** (*Crithmo-Armerion maritimae*)
- Silene x montistellensis** Ladero, Rivas Mart., A. Amor, M.T. Santos, M.T. Alonso (*Rumici indurati-Dianthion lusitani*)
- Silybum marianum** (L.) Gaetn. (*Urtico piluliferae-Silybion mariani*)
- Simethis mattiazzi** (Vand.) Sacc. (*Calluno-Ulicetia*)
- Sinapidendron angustifolium** (DC.) Lowe (*Sinapidendron angustifolii-Aeonion glutinosi*)
- Sinapidendron frutescens** (Sol. in Aiton) Lowe var. **frutescens** (*Sinapidendron angustifolii-Aeonion glutinosi*)
- Sinapidendron frutescens** (Sol. in Aiton) Lowe var. **succulentum** Lowe (*Helichryson obconico-devium*)
- Sinapidendron gymnocalyx** (Lowe) Rustan (*Sinapidendron angustifolii-Aeonion glutinosi*)
- Sinapidendron rupestre** Lowe (*Sinapidendron angustifolii-Aeonion glutinosi*)
- Sinapidendron succulentum* (see *Sinapidendron frutescens* var. *succulentum*)
- Sinapis arvensis** L. (*Stellarietia mediae*)
- Sisymbrella aspera** (L.) Spach (*Menthion cervinae*)
- Sisymbrium contortum** Cav. (*Alyso granatensis-Brassicion barrelieri*)
- Sisymbrium crassifolium** Cav. (*Roemerion hybridae*)
- Sisymbrium erysimoides** Desf. (*Malvenion parviflorae*)
- Sisymbrium irio** L. (*Chenopodietalia muralis*)
- Sisymbrium officinale** (L.) Scop. (*Sisymbrietalia officinalis*)
- Sisymbrium orientale** (L.) Scop. (*Chenopodietalia muralis*)
- Sisymbrium runcinatum** Lag. ex DC. (*Malvenion parviflorae*)
- Smilax altissima* (see *Smilax aspera* var. *altissima*)
- Smilax aspera** L. var. **aspera** (*Quercetia ilicis*)
- Smilax aspera** L. var. **altissima** Moris & De Not (*Quercu rotundifoliae-Oleion sylvestris*)
- Smilax canariensis** Willd. (*Pruno hixae-Lauretea novocanariensis*)
- Smilax divaricata** Sol. ex H.C. Watson (*Lauro azoricae-Juniperetia brevifoliae*)
- Smilax pendulina** Lowe (*Visneo mocanerae-Apollonion barbujanae*)
- Smyrniolum olusatrum** L. (*Smyrniolum olusatrum*)
- Smyrniolum perfoliatum** L. (*Galio-Alliarion petiolatae*)
- Solanum dulcamara** L. (*Salici purpureae-Populetea nigrae*)
- Solanum linnaeanum** Hepper & P.M. Jaeger (*Salsolo vermiculatae-Peganetalia harmalae*)
- Solanum luteum** Mill. (*Diplotaxion eruroidis*)
- Solanum mauritanium** Scop. (*Ageratinio adenophorae-Ipomaeion acuminatae*)
- Solanum nigrum** L. (*Stellarietia mediae*)
- Solanum villosum** Mill. (*Diplotaxion eruroidis*)
- Solenopsis laurentia** (L.) C. Persl (*Isoetion*)
- Solidago azorica** (see *Solidago sempervirens* subsp. *azorica*)
- Solidago fallit-tirones** (see *Solidago virgaurea* subsp. *fallit-tirones*)
- Solidago sempervirens** L. subsp. **azorica** (Hochst. ex Seub.) Semple (*Euphorbio azoricae-Festucion petraeae*)
- Solidago virgaurea** L. subsp. **fallit-tirones** (Font Quer) Rivas Mart., Fern. Gonz. & Sánchez Mata (*Linario saxatilis-Senecionion carpetani*)
- Solidago virgaurea** L. subsp. **virgaurea** (*Quercu-Fagetia*)
- Sonchus aquatilis** Pourr. (*Molinio arundinacea-Holoschoenion vulgaris*)
- Sonchus asper** (L.) Hill. subsp. **asper** (*Stellarietia mediae*)
- Sonchus fruticosus** L.f. (*Euphorbion melliferae*)
- Sonchus maderensis* (see *Sonchus ustulatus* subsp. *maderensis*)
- Sonchus maritimus** L. (*Juncetalia maritimi*)
- Sonchus oleraceus** L. (*Stellarietia mediae*)
- Sonchus pinnatus** Aiton (*Euphorbion melliferae*)
- Sonchus tenerrimus** L. (*Parietarietalia*)
- Sonchus ustulatus** Lowe subsp. **maderensis** Aldrige (*Sinapidendron angustifolii-Aeonion glutinosi*)
- Sonchus ustulatus** Lowe subsp. **ustulatus** (*Sinapidendron angustifolii-Aeonion glutinosi*)
- Sorbus aria** (L.) Crantz (*Quercetalia pubescenti-petraeae*)
- Sorbus aucuparia** L. (*Betulo pendulae-Populetea tremulae*)
- Sorbus latifolia** (Lam.) Pers. (*Quercetalia pubescenti-petraeae*)
- Sorbus maderensis** (Lowe) Dode (*Polysticho falcinelli-Ericion canariensis*)
- Sorbus terminalis** (L.) Crantz (*Quercetalia pubescenti-petraeae*)
- Southbya tophacea** (Spruce) Spruce (*Adiantetalia capilli-veneris*)
- Sparganium angustifolium** Michaux (*Littorelletalia*)
- Sparganium emersum** Rehmann (*Phragmition communis*)
- Sparganium erectum** L. subsp. **erectum** (*Magno-Carici elatae-Phragmitetia australis*)
- Sparganium erectum** L. subsp. **microcarpum** (Newman) Domino (*Glycerio-Sparganion*)
- Sparganium erectum** L. subsp. **neglectum** (Beeby) K. Richt. (*Glycerio-Sparganion*)
- Sparganium microcarpum* (see *Sparganium erectum* subsp. *microcarpum*)
- Sparganium neglectum* (see *Sparganium erectum* subsp. *neglectum*)
- Spartina densiflora** Brongr. (*Spartinetia maritimae*)
- Spartina maritima** (Curtis) Fernald (*Spartinetia maritimae*)
- Spartina versicolor** Fabre (*Juncetalia maritimi*)
- Spergula arvensis** L. (*Scleranthion annui*)
- Spergula morisonii** Bureau (*Thero-Airion*)
- Spergularia australis** (Samp.) Prain in B.D. Jackson (*Crithmo-Daucion halophili*)
- Spergularia azorica** Willk. (*Euphorbio azoricae-Festucion petraeae*)
- Spergularia bocconeii** (Scheele) Graeben. (*Saginetia maritimae*)
- Spergularia capillacea** (Kindb) Willk. in Willk & Lange (*Poion supinae*)
- Spergularia fallax** Lowe (*Mesembryanthemion crystallini*)
- Spergularia marina** (L.) Besser (*Saginetia maritimae*)
- Spergularia media** (L.) C. Presl. (*Juncetia maritimi*)
- Spergularia purpurea** (Pers.) G. Don f. (*Polycarpion tetraphylli*)
- Spergularia rubra** (L.) J. Presl & K. Presl var. **rubra** (*Polygono arenastri-Poetalia annuae*)
- Spergularia rupicola** Lebel ex Le Jolis (*Crithmo-Armerion maritimae*)
- Spergularia segetalis** (L.) G. Don (*Scleranthion annui*)
- Sphagnum angustifolium** (Russ.) C.E.O. Jensen (*Erico tetralicis-Sphagnetalia papilloso*)
- Sphagnum auriculatum** Schimp. (*Sphagno-Utricularion*)
- Sphagnum capillifolium** (Ehrh) Hedw. (*Erico tetralicis-Sphagnetalia papilloso*)

- Sphagnum centrale** C.E.O. Jansen (*Oxycocco-Sphagnetea*)
Sphagnum compactum DC. (*Erico tetralicis-Sphagnetalia papillo-*
pilosii)
Sphagnum cuspidatum Hoffm. (*Rhynchosporion albae*)
Sphagnum denticulatum Brid. (*Alnetea glutinosae*)
Sphagnum flexuosum Dozy & Molk. (*Caricetalia nigrae*)
Sphagnum inundatum Russow (*Scheuchzerio palustris-Cari-*
cetea nigrae)
Sphagnum molle Sull. (*Erico tetralicis-Sphagnetalia papillo-*
si)
Sphagnum papillosum Lind. (*Oxycocco-Sphagnetea*)
Sphagnum platyphyllum (Braitwh.) Warnst. (*Scheuchzerio*
palustris-Caricetea nigrae)
Sphagnum rubellum Wilson (*Erico tetralicis-Sphagnetalia*
papillo-)
Sphagnum russowii Warnest. (*Erico tetralicis-Sphagnetalia*
papillo-)
Sphagnum squarrosum Crome (*Alnetea glutinosae*)
Sphagnum subnitens Russow & Warnst. (*Erico tetralicis-*
Sphagnetalia papillo-)
Sphagnum subsecudum Ness. var. **subsecudum** (*Erico tetra-*
licis-Sphagnetalia papillo-)
Sphagnum tenellum (Brid) Brid. (*Erico tetralicis-Sphagneta-*
lia papillo-)
Sphenopus divaricatus (Gouan) Rchb. (*Frankenion pulveru-*
lentae)
Spiranthes aestivalis (Poir) Rich. (*Scheuchzerio palustris-*
Caricetea nigrae)
Spiranthes spiralis (L.) Chevall. (*Festuco-Brometea*)
Spirodela polyrhiza (L.) Schleid. (*Lemnetalia minoris*)
Sporobolus arenarius (Gouan) Duval-Juve (*Sporobolion*
arenarii)
Sporobolus indicus (L.) R.Br. (*Plantaginetalia majoris*)
Stachys algeriensis (see *Stachys officinalis* subsp. *algeriensis*)
Stachys arvensis (L.) L. (*Solano nigri-Polygonetalia convol-*
vuli)
Stachys germanica L. subsp. **lusitanica** (Hoffmanns. & Link)
 Cout. (*Stachyo lusitanicae-Cheirolophenion sempervirentis*)
Stachys lusitanica (see *Stachys germanica* subsp. *lusitanica*)
Stachys ocymastrum (L.) Briq. (*Stellarietea media*)
Stachys officinalis (L.) Trevisan subsp. **algeriensis** (De Noé)
 Franco (*Stachyo lusitanicae-Cheirolophenion semperviren-*
tis)
Stachys officinalis (L.) Trevisan subsp. **officinalis** (*Querc-*
Fagetea)
Stachys palustris L. (*Filipendulion ulmariae*)
Stachys sylvatica L. (*Tilio platyphylli-Acerion pseudoplatani*)
Stachelina dubia L. (*Rosmarinetea officinalis*)
Stauracanthus boivinii (Webb) Samp. (*Stauracanthion boivi-*
nii)
Stauracanthus genistoides (Brot.) Samp. (*Coremation albi*)
Stauracanthus spectabilis Webb subsp. **spectabilis** (*Corema-*
tion albi)
Stauracanthus spectabilis Webb subsp. **vicentinus** (Daveau
 ex Cout.) T.E. Díaz, Rivas Mart. & Fern. Gonz. (*Stauracan-*
thion boivinii)
Stauracanthus vicentinus (see *Stauracanthus spectabilis* subsp.
vicentinus)
Stegogramma pozoi (see *Thelypteris pozoi*)
Stellaria alsine Grimm. (*Montio-Cardaminetalia*)
Stellaria graminea L. (*Nardetalia strictae*)
Stellaria holostea L. (*Querc-Fagetea*)
Stellaria media (L.) Vill. (*Stellarietea mediae*)
Stellaria neglecta Weihe (*Galio-Urticetea*)
Stenogramma pozoi (Lag.) Iwatsuki (*Populetales albae*)
Stipa bromoides (L.) Dörfler (*Brachypodietalia phoenicoidis*)
Stipa capensis Thunb. (*Taeniathero-Aegilopion geniculatae*)
Stipa gigantea (see *Celtica gigantea* subsp. *gigantea*)
Stipa lagascae Rhoem. & Schultz (*Agrostio castellanae-Celti-*
cion giganteae)
Stipa offneri Breistr. (*Lygeo-Stipetalia*)
Stipa tenacissima Loeff. ex L. (*Stipion tenacissimae*)
Suaeda albescens Lázaro Ibiza (*Thero-Suaedion*)
Suaeda maritima (see *Suaeda albescens*)
Suaeda spicata (Willd.) Moq. (*Thero-Suaedion*)
Suaeda splendens (Pourr.) Gren. & Godr. (*Thero-Suaedion*)
Suaeda vera Forssk. ex J.F. Gmel. (*Suaedion verae*)
Succisa pratensis Moench (*Molinietalia caeruleae*)
Taeniatherum caput-medusae (L.) Nevski (*Taeniathero-*
Aegilopion geniculatae)
Tamarix africana Poir. var. **africana** (*Nerio-Tamaricetea*)
Tamarix africana Poir. var. **fluminensis** (Maire) Baum (*Ta-*
maricion africanae)
Tamarix canariensis Willd. (*Nerio-Tamaricetea*)
Tamarix gallica L. (*Tamaricion africanae*)
Tamarix mascatensis Bunge L. (*Nerio-Tamaricetea*)
Tamus communis L. (*Rhamno-Prunetea*)
Tamus edulis Lowe (*Rhamno crenulatae-Oleetalia cerasifor-*
mis)
Tanacetum annuum L. (*Diplotaxion eruroidis*)
Tanacetum corymbosum (L.) Sch. Bip. (*Trifolio medii-Gera-*
nietea sanguinei)
Tanacetum microphyllum DC. (*Diplotaxion eruroidis*)
Tanacetum parthenium (L.) Sch. Bip. (*Artemisienea vulga-*
ris)
Tanacetum vulgare L. (*Artemisietalia vulgaris*)
Taraxacum obovatum (Wild.) DC. (*Poetalia bulbosa*)
Taraxacum officinale Weber (*Arrhenatheretalia elatioris*)
Targionia hypophylla L. (*Bartramio strictae-Polypodium*
cambrici)
Taxus baccata L. (*Querc-Fagetea*)
Teesdalia coronopifolia (J.P. Bergeret) Thell. (*Tuberarion*
guttatae)
Teesdalia nudicaulis (L.) R. Br. (*Tuberarietalia guttatae*)
Teesdaliopsis conferta (Lag.) Rothm. (*Teesdaliopsis-Luzulion*
caespitosae)
Teline maderensis Webb & Berthel. var. **maderensis** (*Bystro-*
pogono punctati-Telinion maderensis)
Teucrium abutiloides L'Hér. (*Sibthorpio peregrinae-Cle-*
thron arboreae)
Teucrium algarbiensis (Cout.) Cout. (*Saturejo-Thymbri-*
on capitatae)
Teucrium betonicum L'Hér. (*Sibthorpio peregrinae-Clethron*
arboreae)
Teucrium capitatum L. (*Rosmarinetalia officinalis*)
Teucrium chamaedrys L. subsp. **chamaedrys** (*Festuco-Bro-*
metea)
Teucrium francoi M. Seq., Capelo, J.C. Costa & R. Jardim
 (*Ranunculo cortusifolii-Geranion canariensis*)
Teucrium fruticans L. (*Pistacio lentisci-Rhamnetalia alater-*
ni)
Teucrium haenseleri Boiss. (*Rosmarinetalia officinalis*)
Teucrium heterophyllum L'Hér. (*Rhamno crenulatae-Olee-*
talia cerasiformis)
Teucrium lusitanicum Schreber (*Saturejo-Thymbri-*
on capita-
tae)
Teucrium pseudochamaepitys L. (*Teucrio pseudochamaepi-*
tyos-Brachypodium retusi)
Teucrium salviastrum Shreb. (*Cytisicion multiflori*)
Teucrium scordium L. subsp. **scordioides** (Schreb.) Maire &
 Petitmenglin (*Agrostion stoloniferae*)
Teucrium scorodonia L. subsp. **scorodonia** (*Quercetalia*
roboris)
Teucrium spinosum L. (*Diplotaxion eruroidis*)
Teucrium vicentinum Rouy (*Eryngio-Ulicenion erinacei*)
Thalictrum minus L. subsp. **majus** (Crantz) Rouy & Foucaud
 (*Trifolio medii-Geranietea sanguinei*)
Thalictrum speciosissimum L. in Loeff. (*Molinio arundina-*
cea-Holoschoenion vulgaris)

- Thamnobryum alopecurum** (Hedw.) Gangulee (*Adiantum capilli-veneris*)
- Thapsia dissecta** (Bois.) Arán & G. Mateo (*Lygeo-Stipetalia*)
- Thapsia maxima** Mill. (*Paeonio broteroi-Quercenion rotundifoliae*)
- Thapsia meridionalis* (see *Thapsia nitida* subsp. *meridionalis*)
- Thapsia minor** Hoffmanns. & Link (*Agrostion castellanae*)
- Thapsia nitida** Laicata subsp. **meridionalis** (*Asparago albi-Rhamnion oleoides*)
- Thapsia nitida** Laicata subsp. **nitida** (*Quercenion broteroi*)
- Thapsia transtagana** Brot. (*Flueggeion tinctoriae*)
- Thapsia villosa** L. (*Agrostietalia castellanae*)
- Theligonum cynocrambe** L. (*Parietation lusitanico-mauritanicae*)
- Thelypteris palustris** Schott (*Alnetea glutinosa*)
- Thelypteris pozoi** (Lag.) Morton (*Thelypterido pozoi-Woodwardion radicans*)
- Thesium humifusum** DC. (*Rosmarineta officinalis*)
- Thesium humile** Vahl (*Thero-Brometalia*)
- Thesium divaricatum** Jan ex Mert. & Koch (*Rosmarineta officinalis*)
- Thlaspi perfoliatum** L. (*Stellarieta mediae*)
- Thuidium tamariscinum** (Hedwg.) Schimp. (*Anomodonto-Polypodieta*)
- Thymbra capitata** (L.) Cav. (*Saturejo-Thymbrion capitatae*)
- Thymelaea broteriana** Cout. (*Ericion umbellatae*)
- Thymelaea coridifolia** (Lam.) Endl. subsp. **dendrobryum** (Rothm.) M. Lainz (*Genistion micrantho-anglica*)
- Thymelaea dendrobryum* (see *Thymelaea coridifolia* subsp. *dendrobryum*)
- Thymelaea passerina** (L.) Coss. & Germ. (*Brachypodion distachyi*)
- Thymelaea procumbens** A. Fern. & R. Fern. (*Ericion umbellatae*)
- Thymelaea ruizii** Loscos (*Rosmarineta officinalis*)
- Thymelaea villosa** (L.) Endl. (*Ericenion umbellatae*)
- Thymus albicans** Hoffmanns & Link subsp. **albicans** (*Coremation albi*)
- Thymus albicans** Hoffmanns & Link subsp. **donyanae** (R. Morales) Rivas Mart. (*Coremation albi*)
- Thymus caespititius** Brot. (*Sedion anglici*)
- Thymus camphoratus** Hoffmanns & Link subsp. **camphoratus** (*Coremation albi*)
- Thymus camphoratus** Hoffmanns & Link subsp. **congestus** Pinto-Gomes, Vasquez, Paiva Ferreira, Ramos & Doncel (*Lavandulo luisieri-Cistenion albidii*)
- Thymus capitellatus** Hoffmanns & Link (*Coremation albi*)
- Thymus carnosus** Boiss. (*Helichryson picardii*)
- Thymus congestus* (see *Thymus camphoratus* subsp. *congestus*)
- Thymus donyanae* (see *Thymus albicans* subsp. *donyanae*)
- Thymus lotocephalus** G. López & R. Moráles (*Saturejo-Thymbrion capitatae*)
- Thymus lusitanicus** Boiss. (*Ericenion umbellatae*)
- Thymus mastichina** (L.) L. (*Helichryso stoechadis-Santolinetalia squarrosae*)
- Thymus micans** Lowe (*Thymenion micans*)
- Thymus pulegioides** L. (*Festuco-Brometea*)
- Thymus sylvestris** Hoffmanns. & Link (*Ulici densi-Thymion sylvestris*)
- Thymus villosus** L. (*Ericenion umbellatae*)
- Tolpis azorica** (Nutt.) P. Silva (*Tolpido azoricae-Holcetea rigidi*)
- Tolpis barbata** (L.) Gaertn. (*Tuberarietalia guttatae*)
- Tolpis macrorhiza** (Lowe) Lowe (*Sinapidendro angustifolii-Aeonion glutinosi*)
- Tolpis succulenta** (Dryand. in Aiton) Lowe (*Tolpido succulentae-Agrostion congestiflorae*)
- Tolpis umbellata** Bertold. (*Tuberarion guttatae*)
- Tolypella glomerata** (Desv.) Leonh. (*Charion vulgaris*)
- Tolypella prolifera** (Ziz ex A. Braun) Leonh. (*Nitellion syn-carpo-tenuissimae*)
- Torilis arvensis** (Hudson) Link subsp. **neglecta** Thell. (*Cardaminetea hirsutae*)
- Torilis elongata** Hoffmanns. & Link (*Geranio pusilli-Anthriscion caucalidis*)
- Torilis japonica** (Houtt.) DC. (*Galio-Alliarion petiolatae*)
- Torilis leptophylla** (L.) Reeb. f. (*Cardamino hirsutae-Geranietea purpurei*)
- Torilis neglecta* (see *Torilis arvensis* subsp. *neglecta*)
- Torilis nodosa** (L.) Gaertn. (*Cardaminetea hirsutae*)
- Tortella tortuosa** (Hedwg.) Limp. (*Polypodion cambrici*)
- Trachelium caeruleum** L. (*Cymbalario-Asplenion*)
- Tradescantia fluminensis** Velloso (*Smyrniunion olusatri*)
- Tragopogon crocifolius** L. (*Brachypodietalia phoenicoidis*)
- Tragopogon dubius** Scop. (*Brachypodion phoenicoidis*)
- Tribulus terrestris** L. (*Chenopodion muralis*)
- Trichocolea tomentella** (Ehrh.) Dumort. (*Montio-Cardaminetalia*)
- Trichophorum caespitosum** (L.) Hartm. subsp. **germanicum** (Palla) Hegi (*Trichophorenion germanici*)
- Trifolium angustifolium** L. (*Thero-Brometalia*)
- Trifolium arvense** L. (*Tuberarietalia guttatae*)
- Trifolium bocconeii** Savi (*Periballio-Trifolion subterranei*)
- Trifolium campestre** L. (*Tuberarietalia guttatae*)
- Trifolium cernuum** Brot. (*Agrostion castellanae*)
- Trifolium cherleri** L. (*Thero-Brometalia*)
- Trifolium dubium** Sibth. (*Arrhenatheretalia elatioris*)
- Trifolium fragiferum** L. (*Trifolio fragiferi-Cynodontion*)
- Trifolium gemellum** Pourr. ex Willd. (*Periballio-Trifolion subterranei*)
- Trifolium glomeratum** L. (*Periballio-Trifolion subterranei*)
- Trifolium hirtum** All. (*Thero-Brometalia*)
- Trifolium lappaceum** L. (*Holoschoenetalia vulgaris*)
- Trifolium medium** L. (*Trifolio medii-Geranietea sanguinei*)
- Trifolium nevadensis* (see *Trifolium repens* subsp. *nevadensis*)
- Trifolium nigrescens** Viv. L. (*Poetalia bulbosae*)
- Trifolium occidentale** D.E. Coombe (*Crithmo-Armerion maritima*)
- Trifolium ochroleucon** Viv. (*Trifolio medii-Geranietea sanguinei*)
- Trifolium ornithopodioides** L. (*Cicendion*)
- Trifolium oxaloides* (see *Trifolium subterraneum* subsp. *oxaloides*)
- Trifolium phleoides** Willd. subsp. **willkommii** (Chab.) Muñoz Rodr. (*Molineriellion laevis*)
- Trifolium pratense** L. (*Molinio-Arrhenatheretea*)
- Trifolium repens** L. subsp. **nevadensis** (Boiss.) Coombe (*Campanulo herminii-Nardenalia strictae*)
- Trifolium repens** L. subsp. **repens** (*Cynosurion cristati*)
- Trifolium resupinatum** L. (*Molinio-Arrhenatheretea*)
- Trifolium retusum** L. (*Agrostion castellanae*)
- Trifolium scabrum** L. (*Astragalo sesamei-Poion bulbosae*)
- Trifolium squamosum** L. (*Juncenion maritimi*)
- Trifolium stellatum** L. (*Tuberarietalia guttatae*)
- Trifolium striatum** L. (*Tuberarietalia guttatae*)
- Trifolium strictum** L. (*Tuberarietalia guttatae*)
- Trifolium subterraneum** L. subsp. **oxaloides** Nyman (*Poetalia bulbosae*)
- Trifolium subterraneum** L. subsp. **subterraneum** (*Periballio-Trifolion subterranei*)
- Trifolium suffocatum** L. (*Poetalia bulbosae*)
- Trifolium sylvaticum** L. (*Tuberarietalia guttatae*)
- Trifolium tomentosum** L. (*Poetalia bulbosae*)
- Trifolium willkommii* (see *Trifolium phleoides* subsp. *willkommii*)
- Triglochin barrelieri* (see *Triglochin bulbosa* subsp. *barrelieri*)
- Triglochin bulbosa** L. subsp. **barrelieri** (Loisel.) Rouy (*Sarcocornietalia fruticosae*)
- Triglochin maritima** L. (*Juncetea maritimi*)
- Trigonella foenum-graecum** L. (*Thero-Brometalia*)
- Trigonella monspeliaca** L. (*Thero-Brometalia*)

- Trigonella polyceratia** L. (*Thero-Brometalia*)
Triplachne nitens (Guss.) Link L. (*Cutandietalia maritimae*)
Tripleurospermum perforatum (Mérat) M. Láinz (*Elytrigion athericae*)
Trisetum dufourei Boiss. (*Hymenocarpo hamosi-Malcolmion trilobae*)
Trisetum flavescens (L.) P. Beauv. (*Arrhenatheretalia elatioris*)
Trisetum hispidum Lange *Linario saxatilis-Senecionion carpetani*)
Trisetum ovatum (Cav.) Pers. (*Molineriellion laevis*)
Trisetum panicum (Lam.) Pers. (*Thero-Brometalia*)
Trisetum scabriusculum (Lag.) Coss. ex Willk. (*Brachypodion distachyi*)
Tropaeolum majus L. (*Nicotiano glauci-Ricinion communis*)
Tuberaria bupleurifolia (Lam.) Willk. (*Hymenocarpo hamosi-Malcolmion trilobae*)
Tuberaria globulariifolia (Lam.) Willk. (*Ericion umbellatae*)
Tuberaria guttata (L.) Fourr. (*Tuberarietalia guttatae*)
Tuberaria lignosa (Sweet) Samp. (*Calluno-Ulicetea*)
Tuberaria major (Willk.) P. Silva & Rozeira (*Stauracanthion boivinii*)
Tulipa sylvestris L. subsp. **australis** (Link) Pamp. (*Lygeo-Stipetalia*)
Turgenia latifolia (L.) Hoffm. (*Centaureetalia cyani*)
Typha angustifolia L. (*Phragmitenion communis*)
Typha domingensis (Pers.) Steud. (*Phragmitetalia*)
Typha latifolia L. (*Phragmitenion communis*)
Ulex airensis Espirito Santo, Cubas, Lousã, C. Pardo & J.C. Costa (*Lavandulo luisieri-Cistion albidi*)
Ulex argenteus Welw. ex Webb (*Ulici argentei-Cistion ladaniferi*)
Ulex australis Clemente subsp. **australis** (*Coremation albi*)
Ulex australis Clemente subsp. **welwitschianus** (Planche) Espirito Santo, Cubas, Lousã, C. Pardo & J.C. Costa (*Coremation albi*)
Ulex congestus (see *Ulex jussiaei* subsp. *congestus*)
Ulex densus Welw. ex Webb (*Ulici densi-Thymion sylvestris*)
Ulex erinaceus Welw. ex Webb (*Eryngio-Ulicenion erinacei*)
Ulex eriocladius C. Vicioso (*Ulici argentei-Cistion ladaniferi*)
Ulex europaeus L. subsp. **europaeus** (*Ulici europaei-Cytision striati*)
Ulex europaeus L. subsp. **latebracteatus** (Mariz) Rothm. (*Ulici europaei-Cytision striati*)
Ulex europaeus L. subsp. **latebracteatus** (Mariz) Rothm. f. **humilis** (Cout.) Cubas (*Dactylo maritimae-Ulicion maritimi*)
Ulex humilis (see *Ulex europaeus* subsp. *latebracteatus* f. *humilis*)
Ulex jussiaei Webb subsp. **congestus** Espirito Santo & Lousã (*Dactylo maritimae-Ulicion maritimi*)
Ulex jussiaei Webb subsp. **jussiaei** (*Ericenion umbellatae*)
Ulex latebracteatus (see *Ulex europaeus* subsp. *latebracteatus*)
Ulex lusitanicus (see **Ulex minor** var. **lusitanicus**)
Ulex micranthus Lange (*Ericenion umbellatae*)
Ulex minor Roth var. **lusitanicus** (Webb) C. Vicioso (*Genistion micrantho-anglicae*)
Ulex minor Roth var. **minor** (*Calluno-Ulicetea*)
Ulex subsericeus (Cout.) Rivas Mart., T.E. Díaz & Fern. Gonz. (*Coremation albi*)
Ulex welwitschianus (see *Ulex australis* subsp. *welwitschianus*)
Ulmus glabra Huds. (*Tilio platyphylli-Acerion pseudoplatani*)
Ulmus minor Mill. (*Fraxino angustifoliae-Ulmenion minoris*)
Umbilicus gaditanus Boiss. (*Parietarietalia*)
Umbilicus heylandianus Webb & Berthel. (*Parietarietalia*)
Umbilicus rupestris (Salisb.) Dandy (*Parietarietalia*)
Urospermum picroides (L.) Scop. ex F.W. Schmidt (*Thero-Brometalia*)
Urtica dioica L. (*Galio-Urticetea*)
Urtica membranacea Poir in Lam. (*Smyrnienion olusatris*)
Urtica morifolia Poir. (*Rubo bollei-Salicetalia canariensis*)
Urtica portosanctana Press (*Malvenion parviflorae*)
Urtica urens L. (*Chenopodietalia muralis*)
Utricularia australis R. Br. (*Utricularion*)
Utricularia gibba L. subsp. **exoleta** (R. Br.) P. Taylor (*Utricularion*)
Vaccaria hispanica (Mill.) Rausch. (*Centaureetalia cyani*)
Vaccinium cylindraceum J.E. Sm. (*Ericetalia azoricae*)
Vaccinium myrtilloides L. (*Quercetalia roboris*)
Vaccinium padifolium Sm. ex Rees (*Sibthorpio peregrinae-Clethrion arboreae*)
Vaccinium uliginosum L. subsp. **microphyllum** (Lange) Tolm. (*Cytision oromediterranei*)
Valantia hispida L. (*Brachypodietalia distachyi*)
Valantia muralis L. (*Geranio pusilli-Anthriscion caucalidis*)
Valeriana dioica L. (*Molinietalia caeruleae*)
Valeriana tuberosa L. (*Rosmarinetea officinalis*)
Valerianella coronata (L.) DC. (*Centaureetalia cyani*)
Valerianella dentata (L.) Pollich (*Tuberarietea guttatae*)
Valerianella discoidea (L.) Loisel. (*Brachypodietalia distachyi*)
Valerianella echinata (L.) DC. in Lam. & DC. (*Roemerion hybridae*)
Valerianella eriocarpa Desv. (*Brachypodietalia distachyi*)
Valerianella locusta (L.) Laterr. (*Stellarietea mediae*)
Valerianella microcarpa Loisel. (*Brachypodietalia distachyi*)
Valerianella pumila (L.) DC. (*Roemerion hybridae*)
Vandenboschia speciosa (Willd.) Kunkel (*Hymenophyllion tunbrigensis*)
Velezia rigida Loeffl. ex L. (*Brachypodion distachyi*)
Veratrum album L. (*Saxifrago spathularis-Betuletum celtibericae*)
Verbascum litigiosum Samp. (*Bromo-Piptatherion miliacei*)
Verbascum montanum (see *Verbascum thapsus* subsp. *montanum*)
Verbascum pulverulentum Vill. (*Onopordenea acanthii*)
Verbascum sinuatum L. (*Carthametalia lanati*)
Verbascum thapsus L. subsp. **montanum** (Schrud.) Bonnier & Layens (*Onopordetalia acanthii*)
Verbascum thapsus L. subsp. **thapsus** (*Epilobietea angustifoliae*)
Verbascum thapsus subsp. *crassifolium* (see *Verbascum thapsus* subsp. *montanum*)
Verbascum virgatum Stokes (*Onopordenea acanthii*)
Verbena officinalis L. (*Plantaginietalia majoris*)
Verbena supina L. (*Verbenion supinae*)
Veronica acinifolia L. (*Isoeto-Nano-Juncetea*)
Veronica agrestis L. (*Polygono-Chenopodion polyspermi*)
Veronica anagallis-aquatica L. (*Magno-Carici elatae-Phragmitetea australis*)
Veronica anagalloides Guss. (*Isoeto-Nano-Juncetea*)
Veronica arvensis L. (*Stellarietea mediae*)
Veronica beccabunga L. (*Rorippion nasturtii-aquatici*)
Veronica catenata Pennell (*Rorippion nasturtii-aquatici*)
Veronica chamaedrys L. (*Origanetalia vulgaris*)
Veronica cymbalaria Bodard (*Cardaminetea hirsutae*)
Veronica dabneyi Hochst (*Festucion francoi*)
Veronica hederifolia L. (*Polygono-Chenopodion polyspermi*)
Veronica humifusa (see *Veronica serpyllifolia* subsp. *humifusa*)
Veronica langei Lacaite (*Myosotidion stoloniferae*)
Veronica micrantha Hoffmann. & Link (*Quercetalia roboris*)
Veronica montana L. (*Fagetalia sylvaticae*)
Veronica officinalis L. (*Quercetalia roboris*)
Veronica persica Poir. (*Solano nigri-Polygonetalia convolvuli*)
Veronica polita Fr. (*Solano nigri-Polygonetalia convolvuli*)
Veronica scutellata L. (*Littorelletalia*)
Veronica serpyllifolia L. subsp. **humifusa** (Dicks.) Syme (*Poion supinae*)
Veronica serpyllifolia L. subsp. **serpyllifolia** (*Cynosurion cristati*)
Veronica triphyllos L. (*Scleranthion annui*)
Viburnum lantana L. (*Prunetalia spinosae*)

Viburnum opulus L. (*Prunetalia spinosae*)
Viburnum tinus L. (*Quercetalia ilicis*)
Viburnum tinus subsp. *subcordatum* (see *Viburnum treleasei*)
Viburnum treleasei Gand (*Ericetalia azoricae*)
Vicia angustifolia L. (*Stellarienea mediae*)
Vicia capreolata Lowe (*Geranio pusilli-Anthriscion caucalidis*)
Vicia costae A. Ansen (*Vicio costei-Echietum plantaginei*)
Vicia cracca L. (*Trifolio medii-Geranietea sanguinei*)
Vicia disperma DC. L. (*Tuberarietea guttatae*)
Vicia ferreirensis Goyder (*Vicio costei-Echietum plantaginei*)
Vicia hirsuta (L.) S.F. Gray (*Centaureetalia cyani*)
Vicia lathyroides L. (*Tuberarietea guttatae*)
Vicia orobus DC. (*Trifolio medii-Geranietea sanguinei*)
Vicia sativa L. (*Stellarienea mediae*)
Vicia sepium L. (*Trifolio medii-Geranietea sanguinei*)
Vicia tenuifolia Roth (*Trifolio medii-Geranietea sanguinei*)
Vicia villosa Roth (*Stellarienea mediae*)
Vinca difformis Pourr. (*Populetales albae*)
Vincetoxicum nigrum (L.) Moench (*Quercetalia ilicis*)
Viola arborescens L. (*Rosmarinetalia officinalis*)
Viola arvensis Murray subsp. **arvensis** (*Stellarietea mediae*)
Viola canina L. (*Violion caninae*)
Viola hirta L. (*Quercetalia pubescenti-petraeae*)
Viola juresii (see *Viola palustris* subsp. *juresii*)
Viola lactea Sm. (*Calluno-Ulicetea*)
Viola langeana Valentine (*Linario saxatilis-Senecionion carpetani*)
Viola palustris L. subsp. **juresii** (Link ex Wein) W. Becker ex Cout. (*Caricion fuscae*)
Viola palustris L. subsp. **palustris** (*Caricetalia nigrae*)
Viola paradoxa Lowe (*Ranunculo cortusifolii-Geranon canariensis*)
Viola riviniana Rchb. (*Quercu-Fagetalia*)
Visnea mocanera L.f. (*Visneo mocanerae-Apollonion barbu-janae*)
Vitex agnus-castus L. (*Rubo ulmifolii-Nerion oleandri*)
Vitis vinifera L. subsp. **sylvestris** (C.C. Gmel.) Hegi (*Salici purpureae-Populetales nigrae*)
Vulpia alopecurus (Schob.) Dumort. (*Linario polygalifoliae-Vulpion alopecuroris*)

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Vulpia ciliata Dumort (*Thero-Brometalia*)
Vulpia fasciculata (Forssk.) Fritsch (*Cutandietalia maritimae*)
Vulpia fontquerana Melderis & Stace (*Hymenocarpo hamosi-Malcolmion trilobae*)
Vulpia geniculata (L.) Link (*Echio plantaginei-Galactition tomentosae*)
Vulpia membranacea (L.) Dumort. (*Malcolmietalia*)
Vulpia muralis (Kunth) Nees (*Tuberarietalia guttatae*)
Vulpia myuros (L.) C.C. Gmel. (*Tuberarietalia guttatae*)
Wahlenbergia hederacea (L.) Rchb. (*Anagallido-Juncion bulbosi*)
Wahlenbergia lobelioides (L.f.) Link subsp. **lobelioides** (*Tuberarietalia guttatae*)
Warnstorfia exammulata (Schimp.) Loeske (*Scheuchzerio palustris-Caricetea nigrae*)
Withania frutescens (L.) Pauquy (*Salsolo vermiculatae-Peganelia harmalae*)
Wolffia arrhiza (L.) Horkel ex Wimmer (*Lemnetalia minoris*)
Woodwardia radicans (L.) Sm. (*Thelypterido pozoi-Woodwardion radicans*)
Xanthium italicum (see *Xanthium strumarium* subsp. *italicum*)
Xanthium spinosum L. (*Chenopodion muralis*)
Xanthium strumarium L. subsp. **italicum** (Moretti) D. Löve (*Bidentetalia tripartitae*)
Xanthium strumarium L. subsp. **strumarium** (*Solano nigri-Polygonetalia convolvuli*)
Xeranthemum cylindraceum Sibth. & Sm. (*Brachypodietalia distachyi*)
Xolantha bupleurifolia (see *Tuberaria bupleurifolia*)
Xolantha globulariifolia (see *Tuberaria globulariifolia*)
Xolantha guttata (see *Tuberaria guttata*)
Xolantha lignosa (see *Tuberaria lignosa*)
Xolantha major (see *Tuberaria major*)
Zannichellia palustris L. (*Potametalia*)
Zannichellia peltata Bertol (*Potametalia*)
Zostera marina L. (*Zosteretea marinae*)
Zostera noltii Hornem. (*Zosteretea marinae*)
Zygophyllum fontanesii Webb & Berthel. (*Polycarpaeo niveae-Traganetalia moquini*)

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<i>Solano mauritiani-Ipomaeetum acuminatae</i>	36	<i>Thero-Suaedetea</i>	18
<i>Solano nigri-Polygonetalia convolvuli</i>	30	<i>Thero-Suaedion</i>	18
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<i>Soncho acaulis-Aeonietalia</i>	22	<i>Thymo camphorati-Stauracanthetum spectabilis</i>	57
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<i>Soncho ustulati-Artemision argenteae</i>	72	<i>Thymo lotocephali-Coridothymetum capitati</i>	58
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<i>Spergulario marinae-Paspalium vaginatum</i>	50	<i>Tolypelletum proliferae</i>	2
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