

## Sintra Vegetation and Landscape

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Fig. 1 – Itinerary of the excursion

The field trip to Sintra region, as part of the 48<sup>th</sup> IAVS Symposium, aims to illustrate well-preserved and representative plant communities of Sintra municipality. It consists of two short field stops and a 3 km walk (Fig.1).

From a geological point of view, the study area has a matrix of sedimentary rocks, cut by intrusive and extrusive magmatic outcrops.

The older sedimentary rocks of the territory were formed during Superior Jurassic, in marine environment. They correspond mostly to limestone, sometimes with marly levels or dolomite. The Cretaceous deposition environment changed cyclically from marine to fluvial and lacustrine. Thus, there are several limestones, marls, clays and sandstones from this period.

Sintra mountain range is the result of

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an intrusive event occurred about 80 million years ago, called “Maciço Eruptivo de Sintra” (MES), i.e. Sintra Eruptive Massif. It consists of a syenite nucleus surrounded by a long granite ring, occasionally separated by a band of gabbros and diorite. By means of contact with rocks dating from the Jurassic period, the MES originated a border of contact metamorphism, forming glassy limestone, calcareous schist, etc.

The landscape of the westernmost half of the District is dominated by several small volcanoes of the “Complexo Vulcânico de Lisboa” (CVL) — Lisbon Volcanic Complex. These were formed during the Superior Cretaceous and the beginning of the Tertiary periods, expelling lava flows and pyroclastic materials in alternate fashion. The resulting basalt complex sits on top of the limestone of the Upper Cretaceous period (Turonian).

Also dating from the Tertiary period, some sites of conglomerates with elements of variable nature and size, and also limestone and clays of deposition in marine environment can be found.

Finally, there are some areas of sand and shingle of ancient beaches and fossil dunes from the Pleistocene, as well as mobile dunes from the Holocene.

The meteorological stations located in Sintra municipality are classified as Oceanic Pluvioserotinal Mediterranean Macrobioclimate. Most of the region falls into Upper Thermomediterranean thermotype, with the exception of the Sintra mountain range, which is classified in the Upper Mesomediterranean thermotype. As for the ombrotype, the majority of this territory is Lower Sub-humid, with the exception, once again, of the Sintra mountain, which belongs to the Upper sub-humid ombrotype, and of a small northern coastal area, which belongs to Dry Upper ombrotype.

Sintra municipality has been under intense human influence since historical times – which is shown by the countless roman, visigothic and medieval remains currently exhibited in the Museum of “São Miguel de Odrinhas”. This area was essentially rural until mid 20<sup>th</sup> century, with exception of the mountain, which has been for long a summer leisure destination for nobleman and the bourgeoisie. Parks and gardens with exotic ornamental vegetation, palaces and glass-houses are abundant in the mountain range. The Palace and the Park of Pena, built in the 19<sup>th</sup> century by D. Fernando II, dominate the mountain landscape and are an example of romantic architecture of Sintra.

During the second half of the 20<sup>th</sup> century, Sintra suffered an intense urban development as a result of the expansion of Lisbon suburbs.

Due to this development, natural vegetation was fragmented and confined to marginal positions in hedges, rocky grounds not suitable for agriculture and inaccessible areas.

Recently, agricultural set aside allowed natural vegetation to re-occupy some of areas formerly ploughed. Therefore, the lower stages of vegetation succession recover nowadays in significant areas. The mature stages – mainly climatophilous woodlands – are very rare and only small nuclei in areas less favorable to the urban expansion remain. As well as coastal areas, which still have well preserved natural vegetation.

This field trip is divided in two parts. In the morning we will visit an example of the most common vegetation series in the area, developing on limestone substrata. The places visited are included in the Olissiponean Super-District (Dividing Portuguese Sector) and Upper Thermomediterranean Lower Subhumid bioclimatic belts.

This vegetation mosaic corresponds to the potential and seral stages of the series ***Arisaro clusii-Quercus broteroi sigmetum*** (figure 3). It is a characteristic and endemic series of limestone territories of the Center West of mainland Portugal. The mature stage is a Portuguese oak woodland — *Arisaro clusii-Quercetum broteroi*.

This woodland frequently exhibits an herbaceous border, the community *Leucanthemo sylvatici-Cheirolophetum sempervirentis*, which also occupies small clearings in the woods where the sunlight is able to penetrate, as opposed to under closed crown cover where is shady and few plants thrive.

This series also includes a wild plum prickly high shrub hedge, *Rubus ulmifolii-Prunetum insitioidis*, an endemic community. Nowadays, well preserved *Quercus faginea* subsp. *broteroi* woodlands are rare and, therefore, it is uncommon to find wild plum hedges in their typical seral position. These communities have, however, a huge development as separation fences of agricultural fields, and therefore are very common in this territory.

In wetter and deeper soils, the wild plum community is replaced by a laurel hedge — *Vincetoxicum difformis-Lauretum nobilis*. This laurel thicket is not very common, appearing typically in hedges close to streams or near rocky and North faced rock walls, shady and often with small water springs.

The first seral stage of this oak woodland is a high scrub, also endemic to the Center West of Portugal, *Bupleuro fruticosae-Arbutetum unedonis*, dominated by strawberry trees and other tall shrubs, such as *Phillyrea latifolia*, *Viburnum tinus* and *Phillyrea angustifolia*.

The second substitution stage is a kermes oak thicket, *Melicope arrectae-Quercetum cocciferae*, a dense high shrub community dominated by kermes oak. This is a very common community in the study area. When the anthropic successional pressure (usually cutting or fire) in dry and rocky places ceases for enough time, this community may not evolve again to the terminal stage of the ecological succession, but instead to a wild olive tree woodland (*Olea europaea* var. *sylvestris*). This is a version of the kermes oak thicket, co-dominated by tall wild olive trees, forming part of secondary woodland. This woodland may eventually evolve to the following stages of succession or become permanent.

The next seral stage is a meadow of perennial grass dominated by *Brachypodium phoenicoides* — *Phlomis lycnitis-Brachypodietum phoenicoides*. Tall grasses dominate this community, allowing a complete covering of the soil all year round.

Finally, the endemic gorse thicket *Salvia sclareoides-Ulicetum densi* stands for the last perennial stage in the successional process in thin soils. This gorse thicket occurs frequently in a mosaic pattern with the two stages described above, associated to recurring but not very intense wildfires.

This series includes an annual plant community of *Helianthemetea guttati* vegetation class, as an extreme regression stage.

In the afternoon, a walk over sea-cliffs is planned. We will pass through several types of coastal vegetation, firstly on limestone cliffs, then on granite cliffs (figure 2). This walk begins in the Olissiponean Superdistrict and enters the Sintranean Superdistrict (both in the Dividing Portuguese Sector). The frontier between the Upper Thermomediterranean Lower Sub-humid belt and the Lower Mesomediterranean Upper Sub-humid belt will be crossed later in the day.

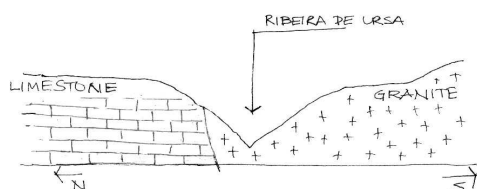


Fig. 2 – Schematic lithological profile of the local coastal cliffs

Sintra municipality exhibits two types of maritime cliffs, according to the type of rock in which they are cut. This fact is paramount to differentiate distinct complexes of plant communities.

However, the vegetation structure is similar in both cases. It is a fairly simple geo-complex formed by a microgeoseries with only one community and a geoseries with only

one series, of which the only climactic stage is a juniper community with kermes oak (*Quercus cocciferae-Juniperetum turbinatae*).

The microgeoseries is formed by a community of herbaceous perennial plants adapted to the extreme habitat conditions in the steep sea cliffs. This community develops on rocks, under the influence of strong salty winds (i.e. splashed by marine salt spray). On limestone (or sandstone) cliffs occurs a community of *Limonium* spp. — *Limonietum multiflori-virgati* (figure 4). On substrata other than limestone, namely syenite, granite or basalt, appears a community of roman carnations (*Armeria pseudarmeria*) and rock carrots (*Daucus halophilus*) — *Diantho cintrani-Daucetum halophilii*, endemic to Sintra (figure 5).

On the other hand, in the cliff platform, over thin soils, thrives the juniper / kermes oak series - *Quercus cocciferae-Juniperetum turbinatae sigmetum* that presents two successional *facies*. In limestone substrata, this series has as seral stages the gorse thicket *Salvio sclareoidis-Ulicetum densi*, variant of *Daphne maritima*, and a *Brachypodietum* meadow, *Phlomidio lychnitidis-Brachypodietum phoenicoides* (figure 3). In non-calcareous substrates a different successional *facies* is present, which has as first seral stage a maritime gorse thicket of *Ulex jussiaei*, *Daphno maritimi-Ulicetum congesti*, followed by a perennial grassland of *Stipa gigantea*, *Avenulo sulcatae-Stipetum giganteae* (figure 5).

Both successional *facies* have as regressive stages extreme communities, which are annual pioneers of the class *Saginetea maritima*.

**1<sup>st</sup> Stop: Cabeceiras da Ribeira de Cabrela (Alcolombal)**

This place has one of the few *Quercus faginea* subsp. *broteroi* woodland that can still be found in the District of Sintra (*Arisaro clusii-Quercetum broteroi*). The understory of oak woodland is nevertheless poorly preserved since it has been used for grazing. However, one can find the species associated to this mediterranean oak woodland, namely climbers — *Smilax aspera*, *Hedera maderensis* subsp. *iberica*, *Rubia peregrina*, *Rosa sempervirens*, *Lonicera implexa* — and shade-loving herbs or shrubs — *Viburnum tinus*, *Coronilla valentina* subsp. *glauca*, *Ruscus aculeatus*, *Iris foetidissima*, *Vinca difformis*.

It is also possible to observe some hedge communities, in mosaic pattern with the oak woodland: a laurel thicket (*Vinco difformis-Lauretum nobilis*), like the one next to the rock wall that limits the woodland, and a tall-forb community (*Leucanthemo silvatici-Cheirolophetum sempervirentis*).

Some of the seral stages of the oak woodland can also be found in a slope that was most likely burnt down a few years ago. Namely a perennial grassland — *Phlomido lychitidis-Brachypodietum phoenicoides* — can be seen in the lower portion of the slope, which nowadays is used for grazing. Also a dense kermes oak woodland — *Melico arrectae-Quercetum cocciferae* — in the upper part,

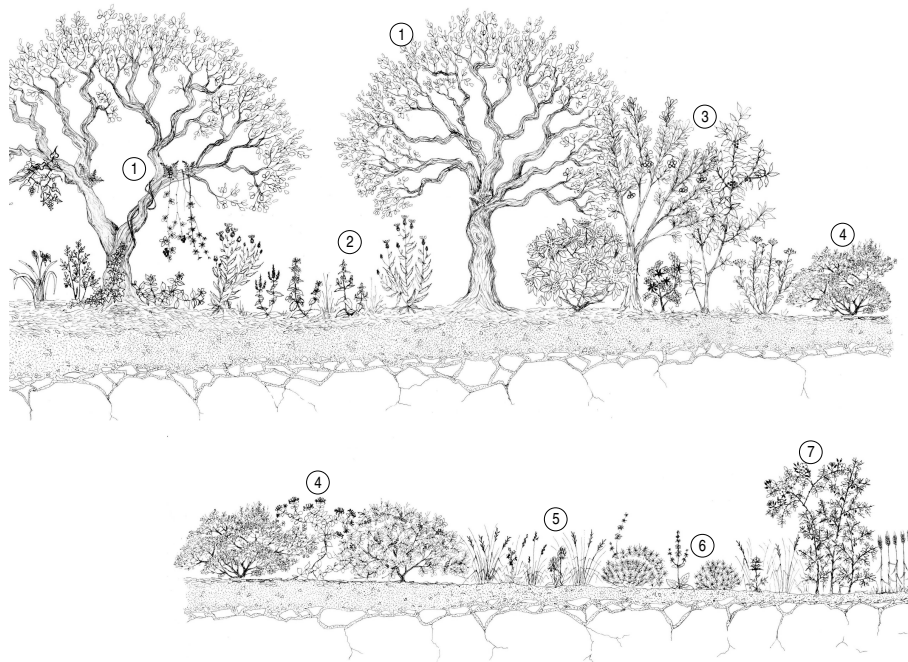


Fig. 3 – *Arisaro clusii-Quercus broteroi* *sigmetum*: 1 *Arisaro clusii-Quercetum broteroi*; 2 *Bupleuro ruticosae-Arbutetum unedonis*; 3 *Leucanthemo silvatici-Cheirolophetum sempervirentis*; 4 *Melico arrectae-Quercetum cocciferae*; 5 *Phlomido lychitidis-Brachypodietum phoenicoides*; 6 *Salvio sclareoides-Ulicetum densi*; 7 *Rubo ulmifolii-Prunetum insittioidis*

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dominated by *Quercus coccifera* and *Pistacia lentiscus* is present.

The path crosses a small stream with rocky banks and bed with some riverside vegetation, although poorly preserved. A community of tamarisk (*Polygono equisetiformis-Tamaricetum africanae*) develops in the rocky banks, where the characteristic habitat conditions of temporary streams of the driest Mediterranean territories are partially reproduced. Contacts with the alluvial terrace — in which the natural vegetation was destroyed and replaced by agricultural fields — traces of ash tree woodlands (*Ficario ranunculoidis-Fraxinetum angustifoliae*) or its most common seral stage — hygrophilous bramble thicket (*Lonicero hispanicae-Rubetum ulmifolii*) can be observed.

### **2<sup>nd</sup> Stop: Moinhos da Torre**

In this site, a community of *Salvia sclareoidis-Ulicetum densi*, gorse thicket dominated by *Ulex densus* — species endemic to Portugal – can be observed. The potential distribution area of these gorse thickets is limited to the limestone soils of the Dividing Portuguese Sector, but the majority of its current occurrence area is in Sintra region. This gorse thicket forms a mosaic pattern with the perennial grassland *Phlomidio lychitidis-Brachypodietum phoenicoides*.

### **3<sup>rd</sup> Stop: Walk between Adraga Beach and Roca Cape**

This walk begins in the limestone cliff next to Adraga beach, stretching through the abrasion platform, amongst communities of *Quercus cocciferae-Juniperetum turbinatae* dominated by *Juniperus turbinata*, *Quercus coccifera* and *Phillyrea angustifolia*. In the steep cliffs over the sea, communities of *Limonietum multiflori-virgati* can be observed.

Further ahead, a mosaic pattern of juniper community with gorse thicket of *Ulex densus* — *Salvia sclareoidis-Ulicetum densi*, variant of *Daphne maritima*, pillow-shaped communities few centimeters high, can be observed. Occasionally, in small patches of sand, one can also see communities of *Armeria welwitschii-Crucianelletum maritimae*, with *Helichrysum picardi*, *Armeria welwitschii* and *Ononis ramosissima*.

Nearly halfway through the walk, we start the descent to Ribeira da Ursa valley. This is a very small valley with steep slopes, cut in the cliff by a stream. Half way through the descent, the limestone changes into granite and correlative vegetation change also follows.

On the slope above the beach, one can see the communities *Diantho cintrani-Daucetum halophilii*, local endemic vegetation — *i.e.*, from the seacoast Sintranean Superdistrict. We emphasize the presence of *Dianthus cintranus* subsp. *cintranus*, *Armeria pseudarmeria*, *Limonium virgatum* and *Daucus halophilus*.

Climbing to Roca Cape, the seral stages of the juniper community in acid plutonic substrata can be observed: the gorse thicket of *Ulex jussiaei* — *Daphno maritimi-Ulicetum congesti* — and the perennial grassland *Avenulo sulcatae-Stipetum giganteae*.

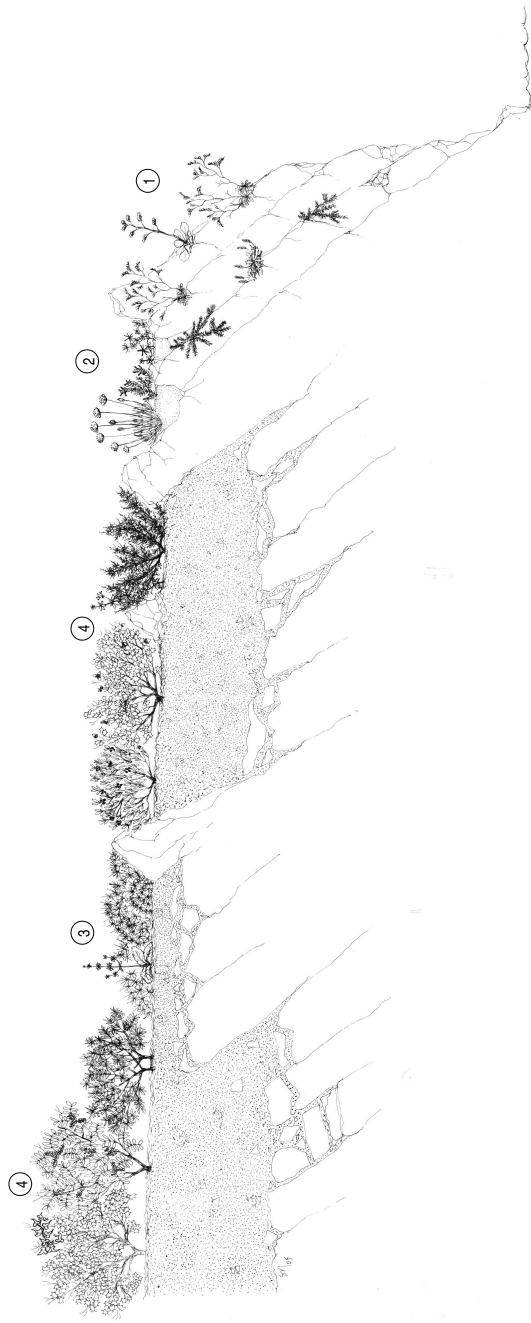
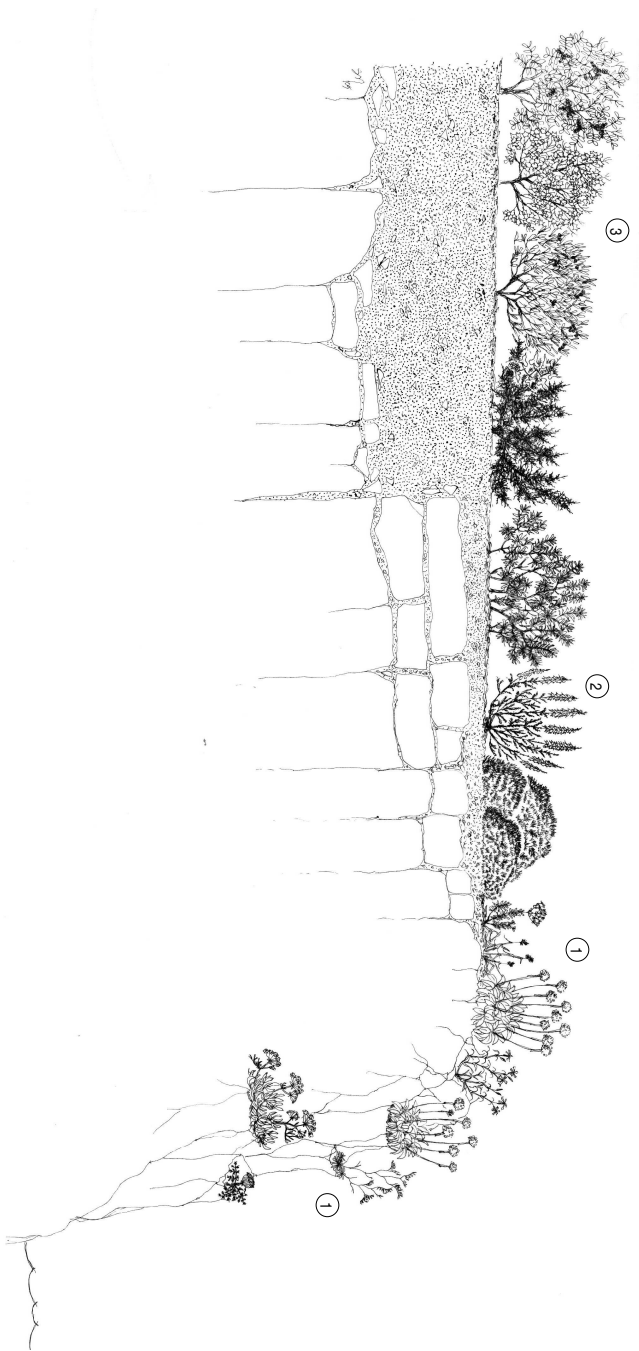


Fig. 4 – *Adraga limestone cliff*: 1 *Limonietum multiflori-virgati*; 2 *Armerio welwitschii-Crucianellietum maritimae*; 3 *Salvio sclareoidis-Ullictetum densi* variant of *Daphne maritimae*; 4 *Quercu cocciferae-Juniperetum turbinatae*

Fig. 5 – *Ursa granite cliff*: 1 *Dianthus citriniflorus*-*Daucum halophilum*; 2 *Daphne maritima*-*Ulex europaeus*; 3 *Quercus coccifera*-*Juniperus turbinata*





In the last stretch of the route, already on syenites, this vegetation is enriched by the presence of shrubby individuals of pyrenean oak (*Quercus pyrenaica*).

The walk ends close to Roca Cape, an outstanding 142 meter high headland above the Atlantic Ocean, in the most westerly place of Continental Europe.

**Synthetic tables and relevees of the most representative communities are presented below:**

Synthetic table of ***Arisaro clusii-Quercetum broteroi*** Br.-Bl., P. Silva & Rozeira 1956 (*Quercetea ilicis*, *Quercetalia ilicis*, *Quercion broteroi*, *Quercenion broteroi*) from LOUSÃ *et al.* (1994), 11 relevees: **Characteristics:** *Quercus faginea* subsp. *broteroi* V, *Smilax aspera* var. *altissima* V, *Rubia peregrina* var. *longifolia* V, *Ruscus aculeatus* IV, *Hedera maderensis* subsp. *iberica* IV, *Euphorbia characias* IV, *Arisarum vulgare* var. *clusii* III, *Laurus nobilis* III, *Rhamnus alaternus* III, *Asparagus aphyllus* III, *Rosa sempervirens* III, *Arbutus unedo* II, *Phillyrea latifolia* II, *Viburnum tinus* II, *Pistacia lentiscus* II, *Myrtus communis* II, *Coronilla glauca* II, *Jasminum fruticans* II, *Daphne gnidium* II, *Osyris alba* II, *Asplenium onopteris* II, *Iris foetidissima* II, *Luzula forsteri* subsp. *baetica* II, *Erica arborea* I, *Quercus coccifera* subsp. *rivasmartinezii* I, *Olea europaea* var. *sylvestris* I, *Paeonia broteroi* I, *Buplerum rigidum* subsp. *paniculatum* I, *Carex distachya* I, *Cephalanthera longifolia* I, *Quercus rotundifolia* +, *Quercus suber* +, *Pulicaria odora* +, *Lonicera implexa* +, *Melica minuta* subsp. *arrecta* +, *Sanguisorba hybrida* +, *Anemone palmata* +, *Asparagus acutifolius* +, *Hyacinthoides hispanica* +, *Selaginella denticulata* +; **Companions:** *Rubus ulmifolius* IV, *Crataegus monogyna* subsp. *brevispina* IV, *Lonicera peryclimenum* subsp. *hispanica* II, *Tamus communis* II, *Calamintha baetica* II, *Brachypodium sylvaticum* II, *Origanum virens* II, *Salvia sclareoides* II, *Dactylis hispanica* II, *Smirium perforatum* II, *Polypodium australe* II, *Asplenium trichomanes* II, *Sedum album* II, *Prunus spinosa* subsp. *isititioides* I, *Vinca difformis* I, *Teucrium scorodonia* I, *Cistus salvifolius* I, *Cheirolophus sempervirens* I, *Brachypodium phoenicoides* I, *Aristolochia paucinervis* I, *Agrimonia eupatoria* I, *Pteridium aquilinum* I, *Arum italicum* I, *Geranium purpureum* I, *Asplenium ceterach* I, *Ptenospartum tridentatum s.l.* +, *Genista triacanthos* +, *Piptatherum mileaceum* +, *Clinopodium vulgare* subsp. *arundanum* +, *Cistus crispus* +, *Digitalis purpurea* +, *Urginea maritima* +, *Ranunculus paludosus* +, *Geum sylvaticum* +, *Bituminaria bituminosa* +, *Smirium olusatrum* +, *Daucus crinitus* +, *Bellis perennis* +, *Allium roseum* +, *Phagnalon saxatile* +, *Plantago lanceolata* +.

Synthetic table of ***Melico arrectae-Quercetum cocciferae quercetosum cocciferae*** Br.-Bl., P. Silva & Rozeira 1956 (*Quercetea ilicis*, *Pistacio lentisci-Rhamnetalia alaterni*, *Asparago albi-Rhamnion oleoidis*) from COSTA *et al.* (2004), 19 relevees: **Characteristics:** *Quercus coccifera* V, *Rhamnus alaternus* V, *Daphne gnidium* V, *Smilax aspera* var. *aspera* V, *Lonicera implexa* V, *Rubia peregrina* var. *longifolia* V, *Melica minuta* subsp. *arrecta* V, *Pistacia lentiscus* IV, *Olea europaea* var. *sylvestris* IV, *Asparagus aphyllus* IV, *Arisarum vulgare* var. *clusii* IV, *Genista tournefortii* III, *Osyris alba* III, *Euphorbia characias* III, *Arbutus unedo* II, *Phillyrea angustifolia* II, *Myrtus communis* II, *Viburnum tinus* II, *Phillyrea*

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*latifolia* II, *Rhamnus oleoides* II, *Coronilla glauca* II, *Ruscus aculeatus* II, *Bupleurum rigidum* subsp. *paniculatum* II, *Hedera maderensis* subsp. *iberica* II, *Hyacinthoides hispanica* II, *Vinca difformis* II, *Anemone palmata* II, *Scilla monophyllos* II, *Carex hallerana* II, *Selaginella denticulata* II, *Laurus nobilis* I, *Bupleurum fruticosum* I, *Erica arborea* I, *Pulicaria odora* I, *Quercus lusitanica* +, *Delphinium pentaginum* +, *Asparagus acutifolius* +, *Carex distachya* +; **Companions:** *Brachypodium phoenicoides* V, *Urginea maritima* V, *Cistus salvifolius* V, *Rubus ulmifolius* IV, *Salvia sclareoides* IV, *Teucrium* *Origanum virens* IV, *Silene longicilia* IV, *Antirrhinum majus* subsp. *linkianum* IV, *Cheirolophus sempervirens* IV, *Dactylis hispanica* IV, *Bellis sylvestris* III, *Geranium purpureum* III, *Prunus spinosa* subsp. *insititoides* II, *Cytisus grandiflorus* II, *Ulex densus* II, *Ulex jussiaei* II, *Cistus crispus* II, *Cistus monspeliensis* II, *Tamus communis* II, *Erica scoparia* II, *scorodonia* subsp. *scorodonia* II, *Ruta chalepensis* II, *Asphodelus lusitanicus* II, *Aristolochia paucinervis* II, *Astragalus lusitanicus* II, *Lathyrus clymenum* II, *Thapsia villosa* II, *Crataegus monogyna* subsp. *brevispina* I, *Pteridium aquilinum* I, *Calendula suffruticosa* subsp. *lusitanica* I, *Clinopodium vulgare* I, *Stachys lusitanica* I, *Piptatherum miliaceum* I, *Barlia robertiana* I, *Arum italicum* I, *Agrimonia eupatoria* +, *Sedum sediforme* +, *Calluna vulgaris* +, *Ferula communis* +, *Smiranium olusatrum* +, *Lavatera olbia* +, *Bryonia dioica* +, *Lithodora prostrata* subsp. *lusitanica* +, *Lobularia maritima* +, *Cynara humilis* +, *Crepis versicaria* +.

Synthetic table of ***Bupleuro fruticosae-Arbutetum unedonis*** Capelo, J.C. Costa & Rivas-Martínez 2002 (*Arbutum unedonis-Laurion nobilis*, *Pistacio lentisci-Rhamnetalia alaterni*, *Quercetea ilicis*) from COSTA et al. (2002), 9 relevees: **Characteristics:** *Arbutus unedo* V, *Erica arborea* V, *Viburnum tinus* V, *Coronilla glauca* V, *Smilax aspera* var. *aspera* V, *Phillyrea angustifolia* V, *Pistacia lentiscus* V, *Asparagus aphyllus* V, *Bupleurum fruticosum* IV, *Rubia peregrina* var. *longifolia* IV, *Myrtus communis* IV, *Quercus coccifera* subsp. *coccifera* IV, *Phillyrea latifolia* IV, *Daphne gnidium* IV, *Rosa sempervirens* IV, *Rhamnus alaternus* IV, *Vicia difformis* IV, *Olea europea* var. *sylvestris* III, *Lonicera implexa* III, *Ruscus aculeatus* III, *Arisarum vulgare* var. *clusii* III, *Osyris alba* III, *Euphorbia characias* III, *Quercus faginea* subsp. *broteroi* II, *Rhamnus oleoides* II, *Lonicera etrusca* II, *Laurus nobilis* II, *Anemone palmata* II, *Bupleurum rigidum* subsp. *paniculatum* II, *Jasminum fruticans* II, *Genista tournefortii* II, *Juniperus turbinata* I; **Companions:** *Rubus ulmifolius* IV, *Teucrium scorodonia* IV, *Brachypodium phoenicoide* IV, *Crataegus monogyna* subsp. *brevispina* IV, *Tamus communis* III, *Erica scoparia* III, *Cistus monspeliensis* III, *Cistus salviifolius* III, *Calamintha baetica* III, *Cheirolophus sempervirens* III, *Pulicaria odora* III, *Geranium purpureum* III, *Prunus spinosa* subsp. *insititoides* II, *Lonicera peryclimenum* subsp. *hispanica* II, *Lavandula luisieri* II, *Picris spinifera* I, *Astragalus lusitanicus* I, *Cistus crispus* I, *Dactylis glomerata* subsp. *hispanica* I, *Cistus albidus* I, *Bryonia dioica* I, *Iris foetidissima* I, *Salvia sclareoides* I, *Geum sylvaticum* I.

Synthetic table of ***Vinco difformis-Lauretum nobilis*** Capelo & J.C. Costa in J.C. Costa, Lopes, Capelo & Lousã 2001 (*Arbutum unedonis-Laurion nobilis*, *Pistacio lentisci-Rhamnetalia alaterni*, *Quercetea ilicis*), from COSTA et al. (2002), 9 relevee: **Characteristics:** *Laurus nobilis* V, *Hedera maderensis* subsp. *iberica* V, *Smilax aspera* var. *aspera* V, *Rosa sempervirens* V, *Prunus spinosa*

subsp. *insititoides* V, *Vinca difformis* V, *Rubus ulmifolius* V, *Quercus faginea* subsp. *broteroi* IV, *Ruscus aculeatus* IV, *Rubia peregrina* var. *longifolia* IV, *Tamus communis* IV, *Arbutus unedo* III, *Viburnum tinus* III, *Osyris alba* III, *Rhamnus alaternus* III, *Quercus coccifera* III, *Euphorbia characias* III, *Lonicera peryclimenum* subsp. *hispanica* III, *Crataegus monogyna* subsp. *brevispina* III, *Ulmus minor* III, *Phillyrea latifolia* II, *Phillyrea angustifolia* II, *Pistacia lentiscus* II, *Olea europaea* var. *sylvestris* II, *Asparagus aphyllus* II, *Asplenium onopteris* II, *Luzula forsteri* subsp. *baetica* II, *Arisarum vulgare* var. *clusii*, II, *Castanea sativa* II, *Fraxinus angustifolia* II, *Corylus avellana* II, *Clematis vitalba* II, *Prunus lusitanica* I, *Bupleurum fruticosum* I, *Lonicera etrusca* I, *Melica minuta* subsp. *arrecta* I, *Hyacinthoides hispanica* I, *Quercus robur* I, *Prunus avium* I, *Rosa canina* I; **Companions:** *Cheirolophus sempervirens* IV, *Teucrium scorodonia* IV, *Origanum virens* III, *Iris foetidissima* III, *Brachypodium sylvaticum* III, *Bryonia dioica* III, *Salix atrocinerea* II, *Pteridium aquilinum* II, *Silene longicilia* II, *Lathyrus clymenum* II, *Piptatherum miliaceum* II, *Leucanthemum sylvaticum* I, *Polypodium vulgare* I, *Cistus salvifolius* I, *Rosmarinus officinalis* I.

Synthetic table of ***Leucanthemo sylvatici-Cheirolophetum sempervirentis*** J.C. Costa, Ladero, T.E Díaz, Lousã, Espírito Santo, Vasconcelos, Monteiro & Amor 1993 (*Trifolio-Geranietea, Melampyro-Holcetalia, Origanion virentis, Stachydo lusitanicae-Cheirolophenion sempervirentis*), from COSTA et al. (2001), 5 relevees: **Characteristics:** *Cheirolophus sempervirens* 5, *Teucrium scorodonia* 4, *Calamintha baetica* 4, *Leucanthemum sylvaticum* 3, *Clinopodium vulgare* subsp. *vulgare* 3, *Clinopodium vulgare* subsp. *arundanum* 3, *Brachypodium sylvaticum* 3, *Origanum virens* 3, *Sedum forsterianum* 2, *Silene latifolia* 2, *Stachys germanica* subsp. *lusitanica* 2, *Vinca difformis* 2, *Heleborus foetidus* 2, *Hypericum perforatum* 2, *Agrimonia eupatoria* 2, *Lathyrus sylvestris* 2, *Carduus broteroi* 1, *Geum sylvaticum* 1, *Picris spinifera* 1, *Primula vulgaris* 1; **Companions:** *Digitalis purpurea* 4, *Prunella vulgaris* 3, *Cistus salvifolius* 3, *Antirrhinum majus* subsp. *linkianum* 3, *Salvia sclareoides* 3, *Geranium purpureum* 3, *Rubia peregrina* var. *longifolia* 3, *Luzula forsteri* subsp. *baetica* 3, *Conyza bonariensis* 2, *Coronilla glauca* 2, *Bupleurum fruticosum* 2, *Myrtus communis* 2, *Erica arborea* 2, *Iris foetidissima* 2, *Bituminaria bituminosa* 2, *Rhagadilus stellatus* 2, *Silene longicilia* 2, *Aristolochia paucinervis* 2, *Arum italicum* 2, *Geranium rotundifolium* 2, *Carex hallerana* 2, *Bellis perennis* 2, *Sanguisorba rupicola* 2, *Brachypodium phoenicoides* 2, *Thapsia villosa* 2, *Calendula suffruticosa* subsp. *lusitanica* 2, *Euphorbia characias* 2, *Rosa sempervirens* 1, *Lapsana communis* 1, *Daucus carota* 1, *Andryala integrifolia* 1, *Centaurium erythraea* subsp. *grandiflorum* 1, *Biscutella lusitanica* 1, *Carex flacca* 1, *Dipsacus comosus* 1, *Sanguisorba hybrida* 1, *Piptatherum mileaceum* 1, *Myosotis baetica* 1, *Oenanthe crocata* 1, *Vicia sativa* 1.

Synthetic table of ***Salvio sclareoidis-Ulicetum densi*** Rivas-Martínez, Lousã, Díaz, Fernández-González & J.C. Costa 1990 ex Capelo, J.C. Costa, Lousã & Neto 1992 **variant of *Daphne maritima*** (*Rosmarinetea, Rosmarinetalia, Saturejo-Thymbrion capitatae, Serratulo estremadurensis-Thymenion sylvestris*), from COSTA et al. (2001), 8 relevees: **Characteristics:** *Ulex densus* V, *Eryngium dilatatum* V, *Salvia sclareoides* V, *Anthyllis vulneraria* subsp. *maura* IV, *Plantago serraria* var. *hispanica* IV, *Carex hallerana* IV, *Cistus monspeliensis* II, *Ruta chalepensis* II, *Rosmarinus officinalis* II, *Bartsia aspera* I, *Iberis linifolia* subsp. *microcarpa* I, *Daucus crinitus* I; **Differentials of variant *Daphne maritima*:** *Daphne gnidium* var. *maritima* V, *Dactylis marina* IV, *Calendula suffruticosa* subsp. *algarbiensis* IV,

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*Daucus halophilus* IV, *Carlina corymbosa* var. *major* IV, *Ononis natrx* subsp. *ramosissima* III, *Helichrysum decumbens* II; **Companions:** *Brachypodium phoenicoides* V, *Cistus salvifolius* V, *Asparagus aphyllus* V, *Rubia longifolia* IV, *Pulicaria odora* IV, *Urginea maritima* IV, *Scabiosa atropurpurea* III, *Echium tuberculatum* III, *Cynara humilis* III, *Quercus coccifera* II, *Erica scoparia* II, *Juniperus turbinata* II, *Plantago lanceolata* II, *Holcus lanatus* II,, *Schoenus nigricans* I, *Centaurium erithrea* subsp. *grandiflorum* I, *Smilax aspera* var. *aspera* I, *Convolvulus althaeoides* I, *Arisarum vulgare* I, *Lonicera implexa* I, *Romulea bulbocodium* I, *Rhamnus alaternus* I, *Allium roseum* I, *Lobularia maritima* I, *Allium ampeloprasum* I, *Cheirolophus sempervirens* I, *Pistacia lentiscus* I, *Phillyrea angustifolia* I.

Synthetic table of **Phlomido lychchitidis-Brachypodietum phoenicoides** Br.-Bl., P. Silva & Rozeira 1956 (*Festuco-Brometea ercti*, *Brachypodietalia phoenicoides*, *Brachypodion phoenicoides*) from CAPELO et al. (1993), 7 relevees: **Characteristics:** *Brachypodium phoenicoides* V, *Dactylis hispanica* V, *Eryngium dilatatum* V, *Daucus crinitus* V, *Urginea maritima* V, *Plantago serraria* var. *hispanica* IV, *Salvia sclareoides* IV, *Phlomis lychnitis* IV, *Sanguisorba spachiana* IV, *Convolvulus althaeoides* IV, *Asphodelus lusitanicus* IV, *Centaurium erythraea* subsp. *eythraea* IV, *Anthyllis vulneraria* subsp. *maura* IV, *Allium roseum* IV, *Orchis italica* IV, *Ophrys lutea* III, *Phagnalon saxatile* III, *Aceras anthropophorum* III, *Anacamptis pyramidalis* III, *Serapias parviflora* II, *Allium pallens* II, *Lathyrus amphicarpus* II, *Ophrys fusca* II, *Nepeta tuberosa* II, *Ajuga iva* II, *Mantisalca salmantica* II, *Phalaris caerulea* II, *Bituminaria bituminosa* II, *Bellis perennis* II, *Romulea bulbocodium* II, *Hypericum perforatum* II, *Orchis coriophora* subsp. *fragans* II, *Orchis tenthredinifera* subsp. *praecox* I, *Orchis mascula* I, *Spiranthes spiralis* I, *Orchis tenthredinifera* subsp. *tenthredinifera* *Gladiolus italicus* I, *Phleum partense* subsp. *bertolonii* I, *Bellis sylvestris* I, *Fritillaria lusitanica* I, *Orchis morio* I, *Ophrys apifera* I, *Ophrys sclopax* I; **Companions:** *Carex hallerana* V, *Pulicaria odora* IV, *Cynara hymilis* IV, *Plantago lanceolata* IV, *Brachypodium distachyon* III, *Bupleurum rigidum* subsp. *paniculatum* III, *Atractylis gummifera* III, *Scorpiurus vermiculatus* III, *Asparagus aphyllus* III, *Anagallis arvensis* III, *Pallenis spinosa* 3, *Trifolium angustifolium* III, *Euphorbia exigua* III, *Scabiosa atropurpurea* III, *Hyparrhenia sinaica* III, *Reichardia intermedia* III, *Astragalus hamosus* II, *Campanula rapunculus* II, *Leontodon longirostris* II, *Bromus lanceolatus* II, *Linum trigynum* II, *Onobrychis pedicularis* II, *Avena barbata* II, *Briza maxima* II, *Carlina corymbosa* II, *Calamintha baetica* II, *Centaurea pullata* II, *Clinopodium vulgare* II, *Origanum virens* II, *Ononis mitissima* II, *Medicago minima* II, *Sherardia arvensis* II, *Crucianella angustifolia* II, *Galium divaricatum* II, *Filago gallica* 1, *Plantago afra* I, *Stachys arvensis* I, *Carduncellus caeruleus* I, *Lathyrus clymenum* I, *Linum strictum* 1, *Agrostis stolonifera* I, *Cynodon dactylon* I, *Holcus lanatus* I, *Picris echioides* I, *Schoenus nigricans* I.

Synthetic table of **Quercococciferae-Juniperetum turbinatae** (Rivas-Martínez 1975) Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990 (*Quercetea ilicis*, *Pistacio lentisci-Rhamnetalia alaterni*, *Asparago albi-Rhamnion oleoidis*) from COSTA et al. (2001), 19 relevees: **Characteristics:** *Juniperus turbinata* V, *Daphne gnidium* var. *maritima* V, *Asparagus aphyllus* V, *Smilax aspera* var. *aspera* V, *Rubia peregrina* var. *longifolia* V, *Quercus coccifera* IV, *Rhamnus alaternus* IV, *Pistacia lentiscus* IV, *Phillyrea angustifolia* IV, *Olea europaea* var. *sylvestris* III, *Arisarum vulgare* var. *clusii* III, *Pulicaria odora* III, *Rhamnus oleoides* II, *Lonicera implexa* II, *Osyris alba* II, *Myrtus communis* II, *Euphorbia characias* II, *Bupleurum rigidum* subsp. *paniculatum* II, *Phillyrea media* I, *Coronilla glauca*

I, *Ruscus aculeatus* I, *Genista tournefortii* I, *Rosa sempervirens* I, *Melica minuta* subsp. *arrecta* I, *Hyacintoides hispanica* I, *Carex hallerana* I, *Asparagus acutifolius* +, *Scilla monophylla* +, *Carex distachya* +, *Sellaginella denticulata* +; **Companions:** *Cistus salvifolius* V, *Brachypodium phoenicoides* V, *Dactylis marina* IV, *Calendula suffruticosa* subsp. *algarbiensis* IV, *Cistus crispus* III, *Ulex densus* III, *Eryngium dilatatum* III, *Urginea maritima* III, *Sedum sediforme* III, *Daucus halophilus* III, *Ulex jussiaei* subsp. *congestus* II, *Lonicera periclymenum* subsp. *hispanica* II, *Cistus monspeliensis* II, *Carlina corymbosa* var. *major* II, *Anthyllis vulneraria* subsp. *maura* II, *Antirrhinum majus* subsp. *linkianum* II, *Cheiranthus sempervirens* II, *Thapsia villosa* II, *Helichrysum decumbens* II, *Armeria pseudarmeria* II, *Carpobrotus edulis* II, *Ditrichia viscosa* II, *Iberis linifolia* subsp. *microcarpa* II, *Plantago serraria* II, *Convolvulus altheoides* II, *Lobularia maritima* II, *Limonium virgatum* II, *Crithmum maritimum* II, *Echium tuberculatum* II, *Cynara humilis* II, *Euphorbia portlantica* I, *Bellis sylvestris* I, *Silene longicilia* I, *Erica scoparia* I, *Rubus ulmifolius* I, *Calluna vulgaris* I, *Halimium calycinum* I, *Armeria welwitschii* subsp. *cinerea* I, *Ulex congestus* x *densus* I, *Narcissus bulbucodium* subsp. *obesus* I, *Romulea bulbucodium* I, *Calamintha baetica* I, *Ulex europaeus* subsp. *latebracteatus* +, *Prunus spinosa* subsp. *insititoides* +, *Astragalus lusitanicus* +, *Iris subbiflora* +, *Rosmarinus officinalis* +, *Phagnalon saxatile* +, *Stipa gigantea* +, *Schoenus nigricans* +, *Holcus lanatus* +, *Plantago lanceolata* +, *Halimium calycinum* +, *Atriplex halimus* +, *Scabiosa atropurpurea* +, *Plantago lanceolata* +, *Suaeda vera* +.

Synthetic table of ***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 (*Calluno-Ulicetea*, *Ulietalia minorisi*, *Dactylo maritimae-Ulicion maritimi*) from COSTA et al. (2001), 16 relevees: **Characteristics:** *Ulex jussiaei* subsp. *congestus* V, *Daphne gnidium* var. *maritima* V, *Dactylis marina* V, *Carlina corymbosa* var. *major* IV, *Armeria pseudarmeria* III, *Calluna vulgaris* III, *Avenula sulcata* II, *Ulex europaeus* subsp. *latebracteatus* I, *Ulex minor* I, *Ulex latebracteatus* x *congestus* +, *Simethis mattiazii*; **Companions:** *Cistus salvifolius* V, *Daucus halophilus* V, *Euphorbia portlantica* V, *Calendula suffruticosa* subsp. *algarbiensis* V, *Carpobrotus edulis* IV, *Brachypodium phoenicoides* IV, *Cistus crispus* IV, *Urginea maritima* IV, *Stipa gigantea* III, *Thapsia villosa* III, *Dianthus cintranus* subsp. *cintranus* III, *Lobularia maritima* III, *Juniperus turbinata* II, *Lavandula luisieri* II, *Pulicaria odora* II, *Asparagus aphyllus* II, *Lithodora prostrata* subsp. *lusitanica* II, *Eryngium dilatatum* II, *Anagallis monelli* var. *microphylla* II, *Holcus lanatus* II, *Agrostis castellana* II, *Asphodelus lusitanicus* II, *Rubus ulmifolius* II, *Armeria welwitschii* subsp. *cinerea* II, *Crucianella maritima* II, *Quercus pyrenaica* I, *Helichrysum decumbens* I, *Pimpinella villosa* I, *Lathyrus clymenum* I, *Centaurea sphaerocephala* I, *Halimium calycinum* I, *Helichrysum picardi* I, *Cistus ladanifer* I, *Quercus coccifera* I, *Pteridium aquilinum* I, *Schoenus nigricans* I, *Coincya pseudeurocastrum* subsp. *cintrana* I, *Anthyllis vulneraria* subsp. *maura* I, *Bellis perennis* I, *Ionopsidium acaule* I, *Rhamnus alaternus* I, *Smilax aspera* var. *aspera* I, *Cuscuta kotschyana* I, *Anthyllis gerardi* +, *Elaeostelinum gummiferum* +, *Spergularia australis* +, *Arenaria montana* +, *Crithmum maritimum* +, *Seseli turtuosum* +, *Beta vulgaris* subsp. *maritima* +, *Ononis ramosissima* +, *Lotus creticus* +, *Aetheorhiza bulbosa* +, *Limonium virgatum* +, *Sedum sediforme* +, *Iberis welwitschii* +, *Scrophularia frutescens* +, *Carex hallerana* +.

Synthetic table of ***Salvio sclareoidis-Ulicetum densi ulicetosum densi*** Rivas-Martínez, Lousã, Díaz, Fernandez-González & J.C. Costa 1990 ex Capelo, J.C. Costa, Lousã & Neto 1992

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(*Rosmarinetea*, *Rosmarinetalia*, *Saturejo-Thymbrion capitatae*, *Serratulo estremadurensis-Thymenion sylvestris*.) from CAPELO et al. (2003), 24 relevees: **Characteristics:** *Ulex densus* V, *Salvia sclareoides* V, *Eryngium dilatatum* V, *Anthyllisvulneraria* subsp. *maura* IV, *Daucus crinitus* III, *Plantago serraria* var. *hispanica* II, *Bartsia aspera* I, *Serratula estremadurensis* I, *Carduncellus caeruleus* I, *Phagnalon rupestre* I, *Ruta chalepensis* I, *Staelhelina dubia* +, *Elaoselinum gummiferum* +, *Iberis linifolia* subsp. *microcarpa* r, *Valeriana tuberosa* r, *Cistus monspeliensis* r; **Companions:** *Brachypodium phoenicoides* V, *Asparagus aphyllus* V, *Bupleurum rigidum* subsp. *paniculatum* V, *Daphne gnidium* IV, *Carex hallerana* IV, *Olea europeae* var. *sylvestris* IV, *Quercus coccifera* IV, *Pulicaria odora* IV, *Centaureum grandiflorum* IV, *Rhamnus alaternus* III, *Dactylis hispanica* III, *Cistus crispus* III, *Atractylis gummifera* III, *Carlina corymbosa* III, *Pallenis spinosa* III, *Cistus salvifolius* III, *Urginea maritima* III, *Rhamnus oleoides* II, *Genista tournefortii* II, *Lonicera implexa* II, *Smilax aspera* var. *aspera* II, *Asphodelus lusitanicus* II, *Campanula rapunculus* II, *Allium pallens* II, *Cynara humilis* II, *Centaurea pullata* II, *Plantago lanceolata* II, *Origanum virens* II, *Calamintha baetica* II, *Lonicera etrusca* II, *Holcus lanatus* II, *Rubus ulmifolius* I, *Myrtus communis* I, *Rubia peregrina* var. *longifolia* I, *Osyris alba* I, *Phagnalon saxatile* I, *Scabiosa atropurpurea* I, *Phlomis lychnitis* I, *Sanguisorba spachiana* I, *Delphinium pentagynum* I, *Hypericum perforatum* I, *Stachys officinalis* subsp. *algeriensis* I, *Anthyllis gerardi* I, *Dittrichia viscosa* I, *Foeniculum vulgare* subsp. *piperitum* I, *Melica minuta* subsp. *arrecta* +, *Pistacia lentiscus* +, *Anacamptis pyramidalis* +, *Bituminaria bituminosa* +, *Quercus lusitanica* r, *Nepeta tuberosa* +, *Lithodora lusitanica* +, *Cynara cardunculus* +, *Schoenus nigricans* +, *Echium tuberculatum* +, *Erica scoparia* +, *Convolvulus althaeoides* +, *Euphorbia characias* +, *Cheirolophus sempervirens* +, *Fritillaria lusitanica* +, *Lathyrus clymenum* +, *Picris echioides* +, *Aristolochia paucinervis* r, *Vinca difformis* r, *Asparagus acutifolius* r, *Dipsacus comosus* r, *Sellaginella denticulata* r, *Reichardia picrioides* r, *Silene longicilia* r, *Serapias vomeracea* r, *Achillea ageratum* r, *Asparagus albus* r, *Ajuga iva* r, *Daucus maximus* r, *Euphorbia amygdaloides* r, *Iris subbiflora* r, *Ruscus aculeatus* r, *Reichardia gaditana* r, *Ulex jussiaei* r, *Cephalanthera longifolia* r, *Tammus communis* r, *Carlina racemosa* r.

Synthetic table of ***Avenula sulcatae-Stipetum giganteae*** Capelo, J.C. Costa, Lousã & Espírito Santo in J.C. Costa, Capelo, Lousã & Espírito Santo 2002 (*Stipo giganteae-Agrostietea castellanae*, *Agrostietalia castellanae*, *Agrostio castellanae-Stipion giganteae*) from Costa et al. (2002), 9 relevees: **Characteristics:** *Stipa gigantea* V, *Agrostis castellana* V, *Brachypodium phoenicoides* V, *Avenula sulcata* subsp. *sulcata* IV, *Stachys officinalis* subsp. *algeriensis* IV, *Arrhenatherum album* III, *Dactylis hispanica* III, *Dactylis glomerata* subsp. *lusitanica* III, *Asphodelus lusitanicus* III, *Thapsia villosa* III, *Avenula sulcata* subsp. *gaditana* I, *Festuca durandoi* I, *Holcus annuus* I; **Companions:** *Holcus lanatus* V, *Erica scoparia* III, *Agrostis curtisii* III, *Thymus villosus* III, *Lavandula luisieri* III, *Carlina corymbosa* III, *Ulex jussiaei* III, *Dianthus cintranus* subsp. *cintranus* III, *Quercus lusitanica* III, *Anthyllis gerardi* II, *Asparagus aphyllus* II, *Briza maxima* II, *Lagurus ovatus* II, *Ulex minor* II, *Brachypodium sylvaticum* II, *Euphorbia characias* II, *Coyncia pseudeurocastrum* subsp. *cintrana* II, *Armeria pseudarmeria* I, *Plantago afra* I, *Plantago coronopus* I,

Synthetic table of ***Armerio welwitschii-Crucianelletum maritimae*** Br.-Bl., Rozeira & P.Silva in J. & G. Br.-Bl., Rozeira & P. Silva 1972 (*Ammophiletea*, *Crucianelletalia maritimae*, *Helichryson picardi*) from COSTA et al. (2001), 22 relevees: **Characteristics:** *Crucianella maritima* V, *Helichrysum picardi* V,

*Armeria welwitschii* subsp. *welwitschii* V, *Pancratium maritimum* IV, *Artemisia crithmifolia* IV, *Ononis natrix* subsp. *ramosissima* IV, *Malcolmia littorea* IV, *Euphorbia portlantica* IV, *Sedum sediforme* IV, *Lotus creticus* III, *Aetheorhiza bulbosa* III, *Scrophularia frutescens* III, *Iberis procumbens* III, *Cyperus capitatus* III, *Linaria caesia* subsp. *decumbens* III, *Seseli tortuosum* III, *Medicago marina* II, *Anagallis monelli* var. *microphylla* II, *Mathiolla sinuata* II, *Silene nicaensis* II, *Carex arenaria* I, *Herniaria maritima* I, *Herniaria ciliolata* subsp. *robusta* +, *Leontodon arenarius* r; **Companions:** *Carpobrotus edulis* V, *Ammophilla arenaria* subsp. *australis* IV, *Corynephorus canescens* var. *maritimus* III, *Verbascum litigiosum* III, *Vulpia alopecuros* II, *Calendula suffruticosa* subsp. *algarbiensis* II, *Senecio gallicus* II, *Silene littorea* II, *Calystegia soldanella* I, *Dactylis marina* I, *Lobularia maritima* I, *Reichardia gaditana* I, *Anchusa calcarea* I, *Pimpinella villosa* I, *Corema album* I, *Otanthus maritimus* +, *Eryngium maritimum* +, *Medicago littoralis* +, *Crithmum maritimum* +, *Euphorbia terracina* r.

Synthetic table of ***Limonietum multiflori-virgati*** J.C. Costa & Capelo in J.C. Costa, Capelo, Lousã & Espírito Santo 1998 (*Crithmo-Limonieteeae*, *Crithmo-Limonietalia*, *Crithmo-Daucion halophilii*) from Costa et al. (1998), 26 relevees: **Characteristics:** *Limonium virgatum* V, *Limonium multiflorum* V, *Dactylis marina* V, *Crithmum maritimum* V, *Plantago coronopus* subsp. *occidentalis* V, *Daucus halophilus* V, *Calendula suffruticosa* subsp. *algarbiensis* IV, *Spergularia australis* III, *Armeria welwitschii* subsp. *cinerea* III, *Helichrysum decumbens* I, *Carlina corymbosa* var. *major* +; **Companions:** *Frankenia laevis* V, *Beta vulgaris* subsp. *maritima* V, *Inula crithmoides* IV, *Leontodon taraxacoides* subsp. *taraxacoides* IV, *Limonium ferulaceum* III, *Lotus creticus* II, *Parapholis incurva* II, *Crucianella maritima* II, *Eryngium dilatatum* II, *Euphorbia portlantica* II, *Sedum sediforme* I, *Carpobrotus edulis* I, *Catapodium maritimum* I, *Romulea bulbocodium* I, *Elymus farctus* subsp. *boreo-atlanticus* +, *Lobularia maritima* +, *Ononis natrix* subsp. *ramosissima* +, *Sonchus oleraceus* +, *Anthyllis vulneraria* subsp. *maura* +, *Centaureum spicatum* +, *Allium ampeloprasum* +, *Mesembryanthemum cristalinum* r, *Mesembryanthemum nodiflorum* r, *Mathiolla sinuata* r, *Trifolium angustifolium* r.

Synthetic table of ***Diantho cintrani-Daucetum halophilii*** J.C. Costa, Capelo, Lousã & Espírito Santo 1998 (*Crithmo-Limonieteeae*, *Crithmo-Limonietalia*, *Crithmo-Daucion halophilii*) from Costa et al. (1998), 26 relevees: **Characteristics:** *Daucus halophilus* V, *Dianthus cintranus* V, *Dactylis marina* V, *Crithmum maritimum* V, *Limonium virgatum* V, *Armeria pseudarmeria* V, *Plantago occidentalis* V, *Calendula algarbiensis* IV, *Spergularia australis* IV, *Helichrysum decumbens* IV, *Silene mariziana* II; **Companions:** *Frankenia laevis* IV, *Euphorbia portlantica* IV, *Carpobrotus edulis* III, *Beta maritima* III, *Lotus creticus* II, *Lobularia maritima* II, *Sedum sediforme* II, *Inula crithmoides* II, *Crucianella maritima* I, *Juniperus turbinata* I, *Allium ampeloprasum* I.

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