

The Landscape and Plant Communities of Serra da Arrábida

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Fig. 1 – Itinerary of the excursion

The field trip takes place in the biogeographic territories of the Sadensean-Dividing Portuguese Subprovince (Coastal Lusitan-Andalusian Province, Mediterranean Region), throughout the upper thermomediterranean thermotype and subhumid ombrotype.

The trip will start in Lisbon (Fig. 1), which is located in the Olissiponean Superdistrict, within the Dividing Portuguese Sector. During the trip, it is possible to observe on the North bank of the Tagus River, on vertisols originated both from acidic and basic bedrocks, a forest community dominated by the oleaster-tree (*Viburno tini-Oleetum sylvestris*). The perennial grassland community *Carici depressae-Hyparrhenietum sinaicae* is a conspicuous subseral stage of this woodland, predeceased by a kermes oak (*Quercus coccifera*) scrub community (*Melico arrectae-Quercetum cocciferae asparagetosum albid*). These communities (except the later) occur also in *Serra da Arrábida*.

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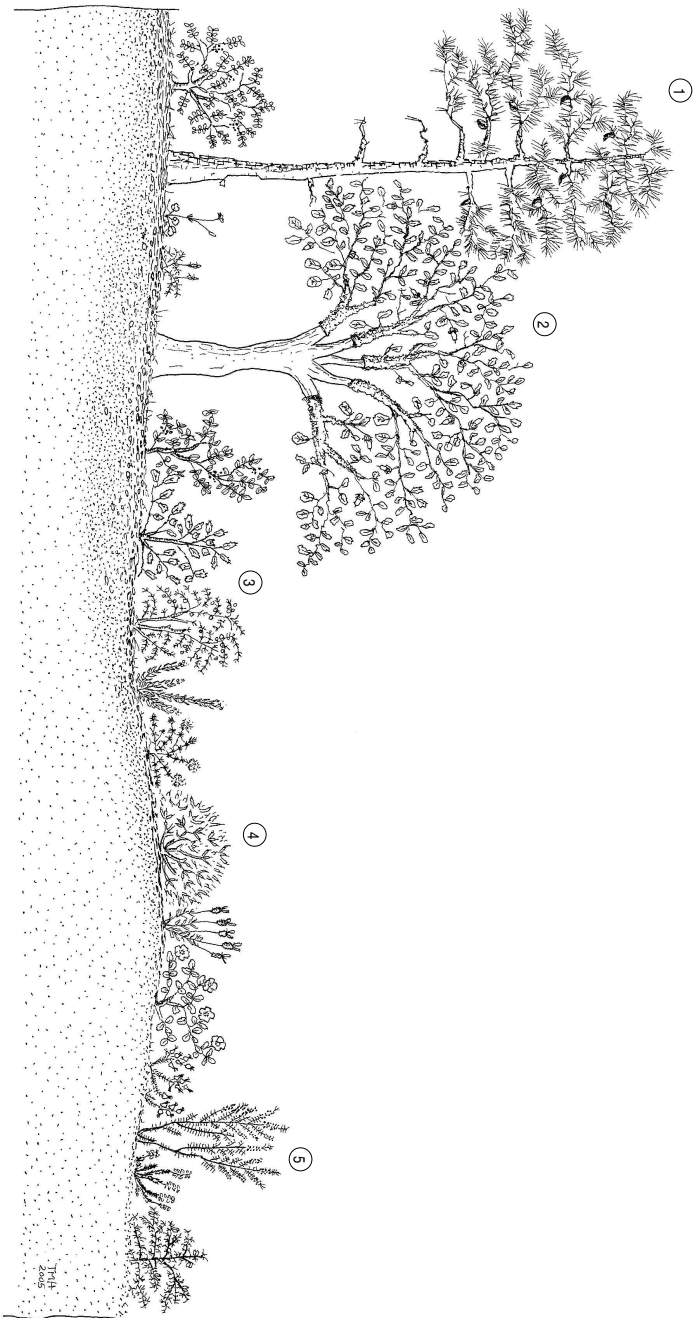


Fig. 2 – Apostiça-Sesimbra: 1 *Pinus pinaster*; 2 *Oleo sylvestris-Quercetum suberis*; 3 *Junipero navicularis-Quercetum lusitanicae*; 4 *Thymo capitellati-Stauracanthetum genistoides*; 5 *Erico umbellatae-Ullicetum weiwitschiani*

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Crossing the Tagus River, we arrive at the Sadensean Superdistrict, which is included in the Ribatagan-Sadensean Sector. Two distinct vegetation series can be found on this territory, both headed by cork oak (*Quercus suber*) woodlands: *Asparago aphylli-Quercus suberis sigmetum*, on sandstone derived soils, and *Oleo sylvestris-Quercus suberis sigmetum*, on slightly hydromorphic sandy soils. Many of these forests were thinned and transformed into “montados” parklands or into pinewoods of *Pinus pinea* or *Pinus pinaster*.

In this territory, the potential and seral stages of the *Asparago aphylli-Quercus suberis sigmetum* are: *Asparago aphylli-Quercetum suberis* (mature forest), *Buplero fruticosae-Arbutetum unedonis* (thicket or mantle high-shrub hedge), *Erico-Quercetum lusitanicae ulicetosum welwitschianii* (low-shrub community), *Avenula sulcatae-Stipetum giganteae* (perennial grassland) and *Erico umbellatae-Ulicetum welwitschiani* (heath scrubland).

In turn, the *Oleo sylvestris-Quercus suberis sigmetum* is made up by the following potential and seral stages: *Oleo sylvestris-Quercetum suberis* (mature forest), *Junipero navicularis-Quercetum lusitanicae* (shrubby community) or *Asparago aphylli-Myrtetum communis* (shrubby community in edaphohigrophilous situation), *Stipa gigantea* community (perennial grasslands), *Thymo capitellati-Stauracanthetum genistoides* (gorse scrubland on deep paleodune sand), *Erico umbellatae-Ulicetum welwitschiani* (heath scrubland on compact substrata) and *Corynephoru macranthero-Arenarietum algarbiense* (annual community). The first stop will be made in one of the local pinewood of “Apostiça” (Fig. 2), in order to look at some of the seral stages included in this *sigmasyntaxon*, well under the pine canopy. The originality and rarity of some of them are noteworthy, namely the shrub community of the endemic juniper (*Juniperus navicularis*) and dwarf-oak (*Quercus lusitanica*) - *Junipero navicularis-Quercetum lusitanicae* – as well as the *Thymo capitellati-Stauracanthetum genistoides* thorny scrubland.

Serra da Arrábida is a national protected area, classified under the status of ‘*Natural Park*’. It integrates the national NATURA 2000 site list, both as a *special area of conservation* (Habitats Directive) and as a *special protection area* (Birds Directive).

Geologically speaking, this sea-facing small mountain (501 meters above m.s.m.) is a small limestone outcrop, mostly of Jurassic origin. Its dominant soils are derived from hard calcium carbonate rocks, some with dolomitical character. In terms of the bioclimate typology (Rivas-Martinez *et al.*, 2004) it is located on the thermomediterranean, upper sub-humid belt and biogeographically stands as the Arrabidensean Superdistrict (Ribatagan-Sadensean Sector). It shares a large proportion of its flora and vegetation with the larger calcareous unit - Dividing Portuguese Sector - found north of the Tagus River (Costa *et al.*, 1998).

Its natural vegetation, generally well preserved, has a high natural value due to the fact that the majority of the *taxa* share a paleomediterranean and/or paleotropical origin. This factor, together with a relatively high annual precipitation rate, no hail, and soils originated from dolomitical limestone, determine a vegetation of great richness and originality.

One such example can be found on the dry, rocky slopes facing the sea or on ravine gravel deposits: the relict nanophanerophytic community dominated by *Euphorbia pedroi*: *Convolvulo fernandesii-Euphorbietum pedroi*. It forms a xeromorphic permanent phytocoenosis in hiperoceanic, topographically xeric and thermomediterranean bioclimate. This community will be visited on the second stop at the "Califórnia" cliffs over East Sesimbra (Fig. 3).

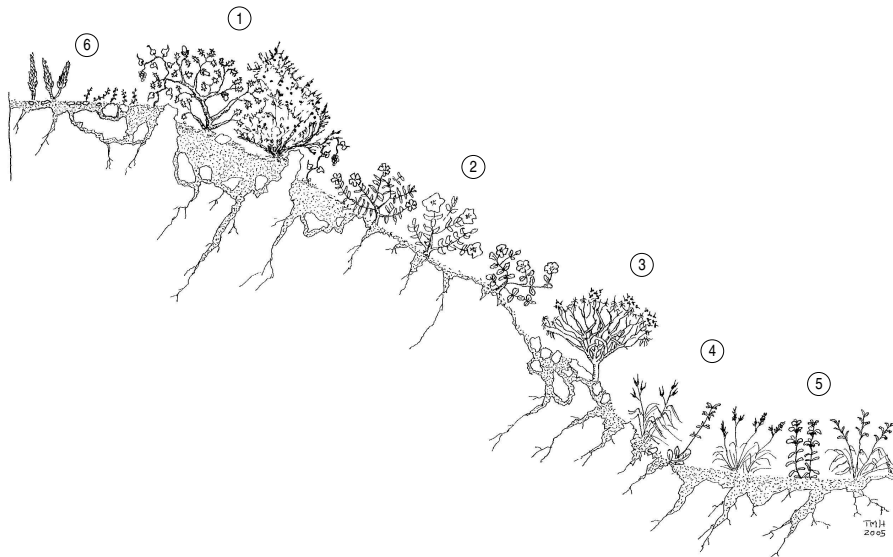


Fig. 3 – Califórnia-Sesimbra: 1 *Quercus cocciferae-Juniperetum turbinatae*; 2 *Phlomido purpureae-Cistetum albidii*; 3 *Convolvulo fernandesii-Euphorbietum pedroi*; 4 *Carici depressae-Hyparrhenietum sinaicae*; 5 *Phlomido lychnitidis-Brachypodietum phoenicoidis*; 6 *Sedetum micrantho-sediformis*

Over the Serra's summit, an edaphoxerophilous permanent high-scrub juniper community is interpreted as the climax: *Quercus cocciferae-Juniperetum turbinatae*. The strongly xeric character of this vegetation is testified by the co-dominance of *Olea europaea* var. *sylvestris*, *Asparagus albus* and ecologically similar taxa in some of these biotopes. Normally, primary positions of the *Quercus-Juniperetum turbinatae* have a perennial grass community as a substitution stage: *Iberido microcarpae-Stipetum offneri*. This community, which can be observed in the steepest and more eroded slopes, is well adapted to fire. The second stage is either *Salvio sclareoidis-Ulicetum densi thymetosum sylvestris* or *Phlomido purpureae-Cistetum albidii*, dominated by *Cistus albidus*. Similarly, at Serra da Arrábida the *Quercus rotundifolia* is always a scrub (2-3 m) never reaching a tree size and thus never establishing as tall woodland. The putative explanation for this fact lies also in the high calcium/magnesium soil rate, becoming toxic to the holm oak. This kind of vegetation can be observed at the third stop "Morro de Jaspe" (Fig. 4).

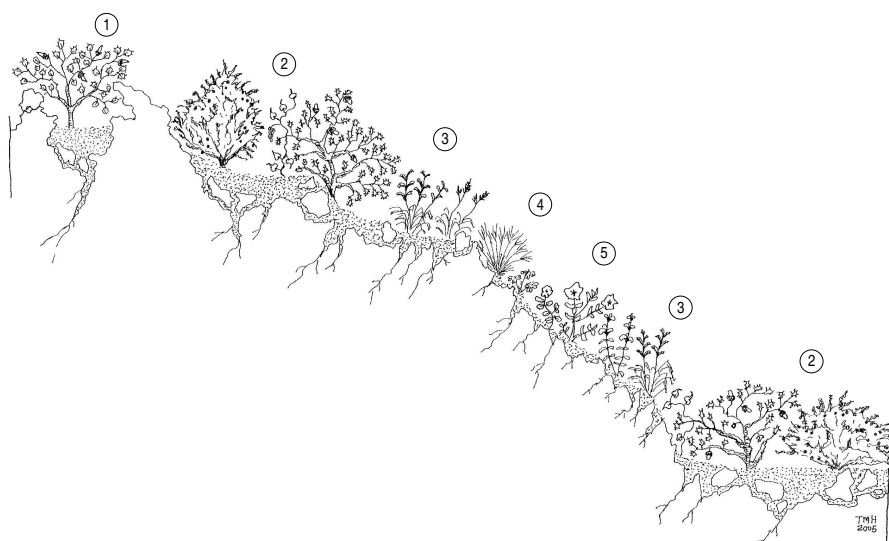


Fig. 4 – Morro de Jaspe-Setúbal: 1 *Quercus rotundifolia*; 2 *Quercus cocciferae-Juniperetum turbinatae*; 3 *Phlomidio lychnitidis-Brachypodietum phoenicoidis*; 4 *Iberido microcarpae-Stipetum offneri*; 5 *Phlomidio purpureae-Cistetum albid*

Another stop will be made on “Mata do Solitário” (Fig. 5), a well-known botanical location. From that site it can be observed the climatophilous woodland located in the well-drained dolomitical slopes, which is formed by micro-mesophanerophytes and dominated by the tree-quermes oak - *Quercus coccifera* subsp. *rivasmartinezii* - reaching 14-15 meters in height. This small tree dominates the mature stage of the local vegetation series, the *Viburno tini-Quercetum rivasmartinesii*. The referred woodland has as thicket or mantle forest, a community dominated by the strawberry tree – *Bupleuro fruticosae-Arbutetum unedonis* - but it is also common to find, on the clearings, the hemicriptophytic community *Leucanthemo sylvatici-Cheirolophetum sempervirentis*, dominated by *Cheirolophus sempervirens*. The next seral stage is the already referred community co-dominated by *Quercus coccifera* and *Juniperus turbinata* (*Quercus cocciferae-Juniperetum turbinatae*). The community *Phlomidio purpureae-Cistetum albid* can also be found as a second substitution stage within this series. It's a low-scrub community found in deep clay-rich soils that suffered erosion of its top horizons.

At the bottom of the larger valleys, where winter water runs and some hygrophilous compensation persists during summertime, and at deep clay-rich soils usually derived from limy marl, the woodland is dominated by *Quercus faginea* subsp. *broteroi* - *Arisaro clusii-Quercetum broteroi*. A community of *Rubus ulmifolius* is its prickly bramble thicket (*Lonicero hispanicae-Rubetum ulmifoliae*). The other substitution stages of these series are the same of the *Viburno tini-Quercus rivasmartinezii sigmetum*.

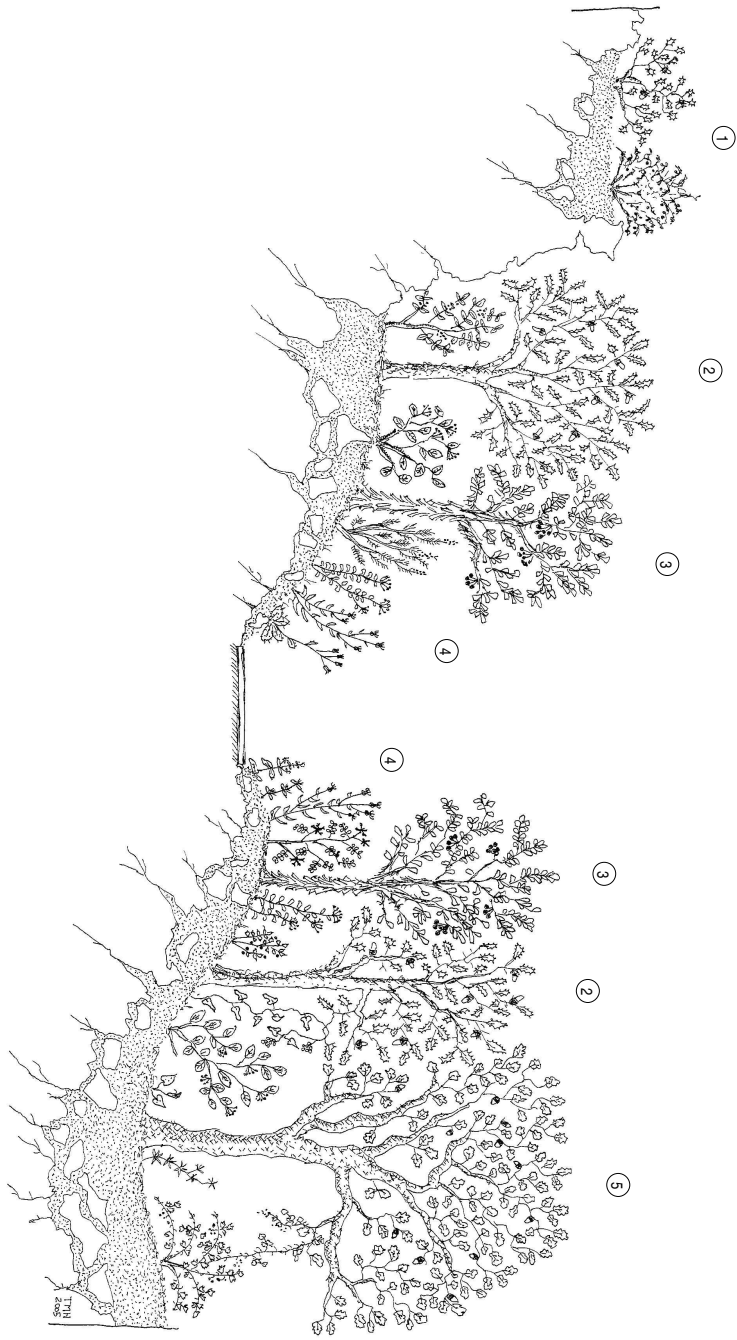


Fig. 5 – Mata do Solitário: 1 *Quercus cociferæ-Juniperetum turbinatæ*; 2 *Viburno tini-Quercetum rivasmartinesii*; 3 *Bupleuro fruticosæ-Arbuletum unedonis*; 4 *Leucanthero sylvatici-Cheirolophetum sempervirentis*; 5 *Arsauro clusii-Quercetum broteroi*

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The community *Phlomido lychnitidis-Brachypodium phoenicoidis* (dominated by the perennial tall grass *Brachypodium phoenicoides*), an important *Orchidaceae* habitat, is rather ubiquitous on the Serra's foothills. Often seen on deeper soils, it also frequently appears in mosaic with the community *Salvio sclareoidis-Ulicetum densi thymetosum sylvestris* (dominated by *Ulex densus* and *Thymus zygis* subsp. *sylvestris*), which occupies the rockier and most eroded positions.

Other equally interesting communities occupy some smaller patches of this landscape: The *Sileno longiciliae-Antirrhinetum linkiani* is a dwarf perennial chasmo-comophyte community found on limestone walls and on rock crevices of Serra da Arrábida. On those locations it can also be found the chasmoitic community *Narciso calcicolae-Asplenietum rutae-murariae*. The succulent plants *Sedum sediforme* and *Sedum album* var. *micranthum* are common on flat rocks and form the *Sedetum micrantho-sediformis* community.

Finally, a reference to the community *Helianthemo stoechadifoliae-Limonietum virgatae*, that takes place on sea cliffs splashed by marine salt spray.

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

Synthetic table of ***Viburno tini-Oleetum sylvestris*** J.C. Costa, Capelo & Lousã 1994 (*Quercus-Oleion*, *Quercetalia ilicis*, *Quercetea ilicis*), from Costa *et al.* 1994, 24 relevees: **Characteristics:** *Olea europaea* var. *sylvestris* V, *Rhamnus alaternus* V, *Smilax aspera* var. *altissima* V, *Rubia peregrina* var. *longifolia* V, *Vinca difformis* V, *Arum italicum* s. l. V, *Arisarum vulgare* var. *clusii* V, *Tamus communis* V, *Viburnum tinus* IV, *Pistacia lentiscus* IV, *Asparagus albus* IV, *Ruscus aculeatus* IV, *Asparagus aphyllus* IV, *Ceratonia siliqua* III, *Quercus coccifera* III, *Rosa sempervirens* III, *Acanthus mollis* II, *Rhamnus oleoides* III, *Phillyrea latifolia* III, *Daphne gnidium* III, *Arbutus unedo* II, *Lonicera implexa* II, *Osyris alba* II, *Coronilla glauca* II, *Hedera maderensis* subsp. *iberica* II, *Lonicera etrusca* II, *Fraxinus angustifolia* II, *Ulmus minor* II, *Myrtus communis* I, *Carex distachya* I, *Anemone palmata* I, *Iris foetidissima* I, *Quercus suber* +, *Quercus rotundifolia* +, *Juniperus turbinata* +, *Jasminum fruticans* +, *Teucrium fruticans* +, *Phlomis purpurea* +, *Laurus nobilis* r, *Erica arborea* r, *Phillyrea media* r, *Paeonia broteroi* r, *Bupleurum fruticosum* r, *Bupleurum rigidum* subsp. *paniculatum* r, *Carex hallerana* r, *Euphorbia characias* r; **companions:** *Bryonia dioica* V, *Rubus ulmifolius* IV, *Smirnum olusatrum* IV, *Geranium purpureum* IV, *Piptatherum miliaceum* IV, *Urtica membranacea* IV, *Urginea maritima* IV, *Lonicera peryclimenum* subsp. *hispanica* III, *Parietaria judaica* III, *Prunus spinosa* subsp. *insititoides* II, *Carataegus monogyna* subsp. *brevispina* II, *Ruta chalepensis* II, *Dactylis hispanica* II, *Galium aparine* II, *Brachypodium phoenicoides* II, *Orobanche ramosa* subsp. *nana* II, *Salvia sclareoides* II, *Asphodelus lusitanicus* II, *Calamintha baetica* I, *Asparagus asparioides* I, *Salpichroa organifolia* I, *Opuntia stricta* I, *Silene dioica* I, *Ulex jussiaei* I, *Cistus monspeliensis* I, *Cistus albidus* I, *Cistus salviifolius* +, *Viola riviniana* +, *Phagnalon saxatile* +, *Rosmarinus officinalis* +, *Allium roseum* +, *Polypodium australe* +, *Rosa canina* r, *Brachypodium sylvaticum* r, *Silene longicilia* r, *Barlia robertiana* r, *Lavandula multifida* r, *Aristolochia*

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paucinervis r, *Biscutella lusitanica* r, *Astragalus lusitanicus* r, *Allium neapolitanum* r, *Narcissus bulbucodium* var. *obesus* r.

Synthetic table of ***Asparago aphylli-Quercetum suberis*** J.C. Costa, Capelo, Lousã & Espírito Santo 1996 (*Quercus-Oleion*, *Quercetalia ilicis*, *Quercetea ilicis*), from Costa *et al.* 2002, 30 relevees: **Characteristics:** *Quercus suber* V, *Smilax aspera* var. *altissima* V, *Rubia peregrina* var. *longifolia* V, *Asparagus aphyllus* V, *Quercus faginea* subsp. *broteroi* IV, *Rhamnus alaternus* IV, *Daphne gnidium* IV, *Hedera maderensis* subsp. *iberica* IV, *Teucrium scorodonia* IV, *Arbutus unedo* III, *Olea europea* var. *sylvestris* III, *Rosa sempervirens* III, *Pistacia lentiscus* III, *Quercus coccifera* III, *Myrtus communis* III, *Osyris alba* III, *Ruscus aculeatus* III, *Euphorbia characias* III, *Quercus lusitanica* III, *Lonicera etrusca* III, *Arisarum vulgare* var. *clusii* III, *Deschampsia stricta* III, *Scilla monophyllos* III, *Phillyrea latifolia* II, *Viburnum tinus* II, *Erica arborea* II, *Phillyrea angustifolia* II, *Carex distachya* II, *Asplenium onopteris* II, *Pulicaria odora* II, *Vinca difformis* II, *Iris foetidissima* II, *Epipactis tremolsii* II, *Cephalantera longifolia* II, *Laurus nobilis* I, *Lonicera implexa* I, *Biarum galiari* I, *Luzula forsteri* subsp. *baetica* I, *Asparagus acutifolius* I, *Rhamnus oleoides* +, *Quercus x airensis* +, *Genista tournefortii* +, *Hyacinthoides hispanica* +, *Anemone palmata* +, *Sanguisorba hybrida* +, *Melica minuta* subsp. *arrecta* +, *Coronilla glauca* r, *Paeonia broteroi* r, *Carex hallerana* r; **companions:** *Rubus ulmifolius* V, *Tamus communis* IV, *Cistus salvifolius* IV, *Ulex jussiaei* IV, *Crataegus monogynea* subsp. *brevispina* III, *Prunus spinosa* subsp. *insititoides* III, *Lonicera peryclimenum* subsp. *hispanica* III, *Lavandula luisieri* III, *Brachypodium phoenicoides* III, *Cheirolophus sempervirens* III, *Calamintha baetica* III, *Origanum virens* III, *Urginea maritima* III, *Geranium purpureum* III, *Aristolochia paucinervis* III, *Lavandula luisieri* II, *Pteridium aquilinum* II, *Erica scoparia* II, *Erica cinerea* II, *Lithodora prostrata* II, *Cistus crispus* II, *Genista triacanthus* II, *Cistus psilosepalus* II, *Clinopodium vulgare* subsp. *arundanum* II, *Piptaterum mileaceum* II, *Asphodelus lusitanicus* II, *Dactylis glomerata* subsp. *lusitanica* II, *Thapsia villosa* II, *Arum italicum* II, *Quercus pyrenaica* I, *Castanea sativa* I, *Fraxinus angustifolia* I, *Calluna vulgaris* I, *Tamus communis* I, *Ulex airensis* I, *Rosa canina* I, *Bryonia dioica* I, *Prunella vulgaris* subsp. *estremadurensis* I, *Pseudarrhenatherum longifolium* I, *Geum sylvaticum* I, *Agrimonia eupatoria* I, *Origanum virens* I, *Lathyrus clymenum* I, *Clinopodium vulgare* I, *Polypodium australe* I, *Cytisus striatus* +, *Brachypodium sylvaticum* +, *Rosmarinus officinalis* +, *Hypericum perforatum* +, *Silene longicilia* +, *Frangula alnus* r, *Salix atrocinerea* r, *Erica lusitanica* r, *Orobanche hederata* r, *Stachys germanica* subsp. *lusitanica* r, *Digitalis purpurea* r, *Ranunculus ficaria* r, *Carduus broteroi* r, *Smiranium olusatrum* r, *Arrhenatherum album* subsp. *baeticum* r, *Agrostis curtisii* r, *Cistus ladaniferi* +, *Tuberaria lignosa* r, *Simethis matiazii* r, *Astragalus lusitanicus* r, *Cistus monspeliensis* r, *Inula conyza* r, *Orobanche latisquama* r.

Relevee of ***Oleo sylvestris-Quercetum suberis*** Rivas Goday, F. Galiano & Rivas-Martínez in Rivas-Martínez 1987 (*Quercus-Oleion*, *Quercetalia ilicis*, *Quercetea ilicis*), Cova da Morena, 200 m², N, 100 m, from Capelo & Almeida 1993: **Characteristics:** 4 *Quercus suber*, 2 *Olea sylvestris*, 2 *Asparagus aphyllus*, 1 *Arbutus unedo*, + *Quercus coccifera*, + *Pistacia lentiscus*, + *Juniperus navicularis*, + *Smilax aspera* var. *altissima*, + *Rubia peregrina* var. *longifolia*, + *Ruscus aculeatus*; **companions:** + *Rubus*

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ulmifolius, + *Ulex australis* subsp. *welwitschianus*, + *Halimim halimifolium*, + *Halimium calycinum*, + *Lavandula sampaina* subsp. *lusitanica*, + *Lavandula luisieri*, + *Thymus villosus*, + *Cistus salvifolius*, + *Cistus monspeliensis*.

Synthetic table of ***Viburno tini-Quercetum rivasmartinezii*** Rivas-Martínez, Lousã, T.E. Dias, Fernandez González & J.C. Costa 1990 corr. Capelo & J.C. Costa 2001 (*Quercus-Oleion*, *Quercetalia ilicis*, *Quercetea ilicis*), from Capelo & Almeida 1993, 10 relevees: **Characteristics:** *Quercus coccifera* subsp. *rivasmartinezii* V, *Viburnum tinus* V, *Pistacia lentiscus* V, *Arbutus unedo* V, *Phillyrea latifolia* V, *Smilax aspera* var. *altissima* V, *Ruscus aculeatus* V, *Arisarum vulgare* var. *clusii* V, *Phillyrea media* III, *Asplenium onopteris* IV, *Rubia peregrina* var. *longifolia* IV, *Olea europaea* var. *sylvestris* III, *Quercus coccifera* subsp. *coccifera* III, *Bupleurum fruticosum* III, *Deschampsia stricta* III, *Hyacinthoides hispanica* III, *Myrtus communis* III, *Coronilla glauca* II, *Erica arborea* II, *Vinca difformis* II, *Lonicera implexa* II, *Phillyrea angustifolia* II, *Quercus faginea* subsp. *broteroi* I, *Osyris lanceolata* I, *Rhamnus oleoides* I, *Rhamnus alaternus* I, *Jasminum fruticans* I, *Daphne gnidium* I, *Asparagus aphyllus* I, *Peaonia broteroi* I, *Carex distachya* I, *Genaria diphylla* I; **companions:** *Rubus ulmifolius* IV, *Tamus communis* IV, *Ceterach officinarum* III, *Holometecium sericum* II, *Teucrium scorodonia* II, *Lonicera periclymenum* subsp. *hispanica* I, *Geranium purpureum* I, *Aristolochia paucinervis* I.

Synthetic table of ***Arisaro clusii-Quercetum broteroi*** Br.-Bl., P. Silva & Rozeira 1956 (*Quercus-Oleion*, *Quercetalia ilicis*, *Quercetea ilicis*), from Capelo *et al.* 2002, 7 relevees: **Characteristics:** *Quercus faginea* subsp. *broteroi* V, *Viburnum tinus* V, *Smilax aspera* var. *altissima* V, *Ruscus aculeatus* V, *Arisarum vulgare* var. *clusii* V, *Arbutus unedo* IV, *Rubia peregrina* var. *longifolia* IV, *Asplenium onopteris* IV, *Carex distachya* IV, *Phillyrea latifolia* III, *Phillyrea media* III, *Erica arborea* III, *Quercus coccifera* III, *Vinca difformis* III, *Lonicera etrusca* III, *Genista tournefortii* III, *Teucrium scorodonia* III, *Iris foetidissima* III, *Hyacinthoides hispanica* III, *Selaginella denticulata* III, *Laurus nobilis* II, *Myrtus communis* II, *Coronilla glauca* II, *Lonicera implexa* II, *Phillyrea angustifolia* II, *Jasminum fruticans* II, *Peaonia broteroi* II, *Euphorbia characias* II, *Bupleurum rigidum* subsp. *paniculatum* II, *Olea europaea* var. *sylvestris* I, *Acer monspessulanum* I, *Rhamnus alaternus* I, *Deschampsia stricta* I, *Asparagus aphyllus* I, *Anemone palmata* I, *Asparagus acutifolius* I, *Cephalanthera longifolia* I, *Melica minuta* subsp. *arrecta* I, *Pulicaria odora* I; **companions:** *Rubus ulmifolius* V, *Tamus communis* IV, *Geranium purpureum* IV, *Calamintha baetica* III, *Brachypodium sylvaticum* III, *Cistus salvifolius* III, *Cheirolophus sempervirens* II, *Origanum virens* II, *Salvia sclareoides* II, *Polypodium cambricum* var. *serrulatum* II, *Brachypodium phoenicoides* I, *Lonicera periclymenum* subsp. *hispanica* I, *Aristolochia paucinervis* I, *Euphorbia amygdaloides* I, *Agrimonia eupatoria* I, *Narcissus calcicola* I, *Arum italicum* I, *Bellis sylvestris* I, *Carex divulsa* I, *Carex flacca* var. *serrulata* I, *Piptatherum mileaceum* I, *Asplenium trichomanes* var. *quadrialeans* I.

Synthetic table of **Quercus cocciferae-Juniperetum turbinatae** (Rivas-Martínez 1975) Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990 (*Asparago albi-Rhamnion oleoidis*, *Pistacio lentisci-Rhamnetalia alaterni*, *Quercetea ilicis*), from Capelo & Almeida 1993, 27 relevees: **Characteristics:** *Juniperus turbinata* V, *Rhamnus oleoides* V, *Quercus coccifera* IV, *Pistacia lentiscus* IV, *Lonicera implexa* IV, *Smilax aspera* var. *aspera* IV, *Phillyrea angustifolia* III, *Rhamnus alaternus* III, *Olea europea* var. *sylvestris* III, *Rubia peregrina* var. *longifolia* III, *Daphne gnidium* III, *Asparagus aphyllus* III, *Arisarum vulgare* var. *clusii* III, *Anemone palmata* III, *Arbutus unedo* II, *Jasminum fruticans* II, *Osyris alba* II, *Ruscus aculeatus* II, *Buplerum rigidum* subsp. *paniculatum* II, *Carex distachya* II, *Coronilla glauca* II, *Asparagus albus* II, *Myrtus communis* II, *Ceratonia siliqua* II, *Phillyrea latifolia* I, *Phillyrea media* I, *Genista tournefortii* I, *Phlomis purpurea* I, *Euphorbia characias* I, *Lonicera etrusca* I, *Melica minuta* subsp. *arrecta* I, *Scilla monophyllus* I, *Gennaria diphylla* I, *Quercus rotundifolia* +, *Osyris lanceolata* +, *Asparagus acutifolius* +, *Viburnum tinus* +, *Buplerum fruticosum* +, *Rosa sempervirens* +, *Hyacintoides hispanica* +, *Paeonia broteroi* r, *Asplenium onopteris* r; **companions:** *Brachypodium phoenicoides* III, *Rosmarinus officinalis* II, *Cistus albidus* II, *Cistus monspeliensis* II, *Dactylis hispanica* II, *Antirrhinum linkianum* II, *Astragalus lusitanicus* II, *Origanum virens* II, *Cistus crispus* II, *Cistus salvifolius* II, *Urginea maritima* II, *Carex hallerana* II, *Asphodelus aestivus* II, *Pulicaria odora* II, *Lavandula luisieri* II, *Calamintha baetica* I, *Stahelina dubia* I, *Ruta chalepensis* I, *Ulex densus* I, *Erica scoparia* I, *Asphodelus lusitanicus* I, *Bellis sylvestris* I, *Salvia scareoides* I, *Sanguisorba spachiana* I, *Centaurium grandiflorum* I, *Carex flacca* I, *Anthyllis vulneraria* subsp. *maura* I, *Daucus maximus* I, *Convolvulus altheoides* I, *Erygium dilatatum* I, *Rubus ulmifolius* +, *Stipa offeneri* +, *Thymus mastichina* +, *Lathyrus sylvestris* +, *Tulipa australis* +, *Ophris fusca* +, *Anagallis monelli* var. *linifolia* +, *Andryala integrifolia* +, *Iris subbiflora* +, *Narcissus bulbucodium* subsp. *obesus* +, *Phlomis lychinitis* +, *Tamus communis* r, *Ceterach officinarum* r, *Narcissus calcicola* r.

Synthetic table of **Asparago aphylli-Myrtetum communis** Rivas-Martínez, Cantó, Fernández-González & Sanchez-Mata ex J.C. Costa, Lousã & Espírito Santo 1996 (*Asparago albi-Rhamnion oleoidis*, *Pistacio lentisci-Rhamnetalia alaterni*, *Quercetea ilicis*), from Costa et al. 2004, 12 relevees: **Characteristics:** *Myrtus communis* V, *Asparagus aphyllus* V, *Pistacia lentiscus* V, *Quercus coccifera* IV, *Phillyrea angustifolia* IV, *Quercus suber* IV, *Smilax aspera* var. *aspera* IV, *Daphne gnidium* III, *Rubia peregrina* var. *longifolia* III, *Olea europaea* var. *sylvestris* III, *Quercus lusitanica* II, *Rhamnus oleoides* I, *Rhamnus alaternus* I, *Osyris alba* I, *Asparagus acutifolius* +, *Pyrus bourgeaena* +, *Arbutus unedo* +, *Tamus communis* +, *Crataegus monogynea* subsp. *brevispina* +; **companions:** *Cistus salviifolius* V, *Rubus ulmifolius* III, *Ulex australis* subsp. *welwitschianus* III, *Brachypodium phoenicoides* III, *Cistus psilosepalus* III, *Holcus lanatus* II, *Cistus crispus* II, *Erica scoparia* II, *Cistus ladanifer* II, *Cynodon dactylon* II, *Foeniculum vulgare* subsp. *piperitum* II, *Ditrichia viscosa* subsp. *viscosa* II, *Ulex jussiaei* I, *Torilis neglecta* I, *Holoschoenus romanus* subsp. *australis* I, *Lavandula luisieri* I, *Hyparrhenia sinaica* +, *Cistus monspeliensis* +, *Arundo donax* +, *Daucus crinitus* +, *Dactylis glomerata* subsp. *lusitanica* +, *Scolymus maculata* +, *Mantisalca salmantica* +, *Rumex crispus* +, *Juncus acutiflorus* subsp. *rugosus* +, *Halimium calycinum* +, *Halimium halimifolium* +, *Tuberaria lignosa* +, *Calluna vulgaris* +.

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Relevée of ***Convolvulo fernandesii-Euphorbietum pedroi*** G. Pedro ex Capelo 2003 (*Asparago albi-Rhamnion oleoidis*, *Pistacio lentisci-Rhamnetalia alaterni*, *Quercetea ilicis*): Califórnia (Sesimbra), 60 m², S, 120 m, **Characteristics:** 4 *Euphorbia pedroi*, 1 *Olea europeae* var. *sylvestris*, 1 *Rhamnus oleoides*, 1 *Phillyrea angustifolia*, 1 *Pistacia lentiscus*, + *Juniperus turbinata* + *Asparagus albus*, + *Asparagus aphyllus*, + *Arisarum vulgare* var. *clusii*; **companions:** 1 *Rosmarinus officinalis*, + *Cistus monspeliensis*, + *Cistus albidus*, + *Brachypodium retusum*, + *Hyparrhenia hirta*.

Synthetic table of ***Erico-Quercetum lusitanicae*** Rothmaler ex Br.-Bl., P. Silva & Rozeira 1964 (*Quercion fruticosae*, *Pistacio lentisci-Rhamnetalia alaterni*, *Quercetea ilicis*), from Costa et al. 2002, 28 relevees: **Characteristics:** *Quercus lusitanica* V, *Myrtus communis* IV, *Asparagus aphyllus* IV, *Serratula monardii* IV, *Daphne gnidium* III, *Scilla monophyllus* III, *Phillyrea angustifolia* III, *Quercus suber* III, *Rubia peregrina* var. *longifolia* III, *Rhamnus alaternus* II, *Euphorbia transtagana* II, *Arbutus unedo* II, *Anemone palmata* II, *Pulicaria odora* II, *Pistacia lentiscus* I, *Olea europea* var. *sylvestris* I, *Quercus coccifera* I, *Osyris alba* I, *Carex oedipostyla* I, *Carex distachya* +, *Centaurea africana* +, *Erica arborea* +, *Selaginella denticulata* +, *Danthonia decumbens* +; **companions:** *Erica scoparia* V, *Cistus salviifolius* IV, *Lavandula luisieri* IV, *Ulex jussiaei* III, *Lithodora prostrata* subsp. *lusitanica* III, *Erica umbellata* III, *Calluna vulgaris* III, *Asphodelus lusitanicus* III, *Pterospartum tridentatum* subsp. *tridentatum* III, *Genista triacanthos* III, *Brachypodium phoenicoides* II, *Cistus crispus* II, *Urginea maritima* II, *Thapsia villosa* II, *Avenula sulcata* II, *Stipa gigantea* II, *Ulex airensis* II, *Simethis mattiazzii* II, *Ulex australis* subsp. *welwitschianus* II, *Dactylis glomerata* subsp. *lusitanica* II, *Holcus lanatus* II, *Agrostis curtisii* I, *Pteridium aquilinum* I, *Thymus villosus* I, *Cistus psilosepalus* I, *Arrhenatherum album* I, *Halimium ocymoides* I, *Tuberaria lignosa* I, *Cistus monspeliensis* I, *Erica australis* +, *Stachys officinalis* subsp. *algeriensis* +, *Ulex minor* r, *Lonicera periclymenum* subsp. *hispanica* r, *Rubus ulmifolius* r, *Crataegus monogyna* subsp. *brevispina* r, *Allium pruinatum* r, *Hyparrhenia hirta* r, *Fritilaria lusitana* subsp. *stenophylla* r, *Dipecaedi serotini* r, *Sesamoides canescens* r.

Synthetic table of ***Junipero navicularis-Quercetum lusitanicae*** (Rothmaler 1954) Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990 (*Quercion fruticosae*, *Pistacio lentisci-Rhamnetalia alaterni*, *Quercetea ilicis*), from Costa et al. 1994, 8 relevees: **Characteristics:** *Quercus lusitanica* V, *Juniperus navicularis* V, *Serratula alcalae* V, *Corema album* IV, *Daphne gnidium* IV, *Phillyrea angustifolia* III, *Euphorbia transtagana* III, *Scilla monophyllus* II, *Anemone palmata* III, *Asparagus aphyllus* II, *Quercus coccifera* II, *Arbutus unedo* I, *Pistacia lentiscus* I, *Osyris alba* I, *Ruscus aculeatus* I, *Quercus suber* I; **companions:** *Stipa gigantea* V, *Halimium calycinum* IV, *Halimium halimifolium* IV, *Ulex australis* subsp. *welwitschianus* IV, *Erica umbellata* IV, *Calluna vulgaris* IV, *Cistus salviifolius* IV, *Lithodora prostrata* subsp. *lusitanica* IV, *Tuberaria guttata* IV, *Thymus capitellatus* III, *Stauracanthus genistoides* III, *Lavandula sampaina* subsp. *lusitanica* III, *Lavandula luisieri* III, *Urginea maritima* III, *Thapsia villosa* III, *Genista triacanthus* III, *Linaria spartea* III, *Cladonia* sp. III, *Iberis linifolia* subsp. *welwitschii* II, *Cistus crispus* II, *Pterospartum tridentatum* subsp. *tridentatum* II, *Tuberaria lignosa* II, *Andryala integrifolia* II, *Helichrysum picardii* var. *virescens* I, *Orchis mascula* I, *Cytinus machrantherus*

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I, *Magyaris panicifolia* I, *Asphodelus aestivus* I, *Arrhenatherum album* I, *Pteridium aquilinum* I, *Elaeoselinum gummiferum* I.

Synthetic table of ***Bupleuro fruticosae-Arbutetum unedonis*** Capelo, J.C. Costa & Rivas-Martínez 2002 (*Arbutus unedonis-Laurion nobilis*, *Pistacia lentisci-Rhamnetalia alaterni*, *Quercetea ilicis*), from Capelo 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 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 scareoides* I, *Geum sylvaticum* I.

Synthetic table of ***Erico umbelletae-Ulicetum welwitschianii*** Capelo, J.C. Costa, Neto & Lousã in J.C. Costa, Capelo, Neto, Espírito Santo & Lousã 1997 (*Ericion umbellatae*, *Ulicetalia minoris*, *Calluno-Ulicetea*), from Costa et al. 1997, 12 relevees: **Characteristics:** *Ulex australis* subsp. *welwitschianus* V, *Calluna vulgaris* V, *Genista triacanthos* V, *Erica umbellata* IV, *Erica australis* subsp. *australis* IV, *Tuberaria lignosa* IV, *Erica scoparia* IV, *Pterospartum tridentatum* subsp. *tridentatum* III, *Agrostis curtisii* III, *Thymus villosus* II, *Simethis mattiazzii* II, *Cistus psilosepalus* II, *Erica erigena* +; **companions:** *Cistus salviifolius* V, *Halimium halimifolium* V, *Lavandula luisieri* III, *Cistus ladanifer* III, *Cistus crispus* III, *Thymus capitellatus* III, *Rosmarinus officinalis* III, *Daphne gnidium* III, *Halimium calycinum* III, *Lithodora prostrata* subsp. *lusitanica* III, *Pulicaria odora* III, *Briza maxima* II, *Quercus lusitanica* II, *Asphodelus lusitanicus* II, *Cladonia mediterranea* II, *Arrhenatherum album* II, *Cladonia potentosa* II, *Juniperus navicularis* II, *Arbutus unedo* II, *Stipa gigantea* II, *Asparagus aphyllus* II, *Corema album* II, *Myrtus communis* I, *Phillyrea angustifolia* I, *Stauracanthus genistoides* I, *Margotia gummifera* I, *Serratula monardii* I, *Pistacia lentiscus* I, *Anemone palmata* I, *Lavandula sampaiona* subsp. *lusitanica* I, *Osyris alba* I, *Carex hallerana* I, *Dittrichia viscosa* +, *Piptaterum miliaceum* +, *Centaurea aspera* +, *Pimpinella villosa* +, *Holcus lanatus* +, *Carpobrotus edulis* +, *Rubus ulmifolius* +, *Gladiolus italicus* +, *Pteridium aquilinum* +, *Lonicera peryclimenum* subsp. *hispanica* +, *Helichrysum picardi* var. *virescens* +, *Centaureum erythraea* +, *Erygium dilatatum* +.

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Relevée of **Phlomidio purpureo-Cistetum albidae** Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990 (*Ulici argentei-Cistion ladaniferi*, *Lavanduletalia stoechadis*, *Cisto-Lavanduletea*): Santana (Sesimbra), 20m², S, 210 m, **Characteristics:** 3 *Cistus albidus*, 2 *Cistus monspeliensis*, 1 *Cistus salviifolius*, 1 *Lavandula luisieri*, 1 *Thymus mastichina*, + *Phlomis purpurea*, + *Cistus crispus*, + *Astragalus lusitanicus*; **Companions:** 2 *Rosmarinus officinalis*, 1 *Thymbra capitata*, 1 *Brachypodium phoenicoides*, 1 *Daphne gnidium*, + *Hyparrhenia sinaica*, + *Carlina corymbosa*, + *Arisarum vulgare*, + *Dactylis hispanica*, + *Reichardia picroides*, + *Asparagus aphyllus*, + *Urginea maritima*, + *Sipa gigantea*.

Synthetic table of **Thymo capitellati-Stauracanthetum genistoides** (Rothmaler 1954) Rivas-Martínez, T.E. Díaz & Fernández-González (*Coremion albi*, *Stauracantho genistoidis-Halimietalia commutati*, *Cisto-Lavanduletea*), from Neto, 2002, 29 relevés: **Characteristics:** *Stauracanthus genistoide* V, *Thymus capitellatus* V, *Halimium calycinum* V, *Halimium halimifolium* V, *Lavandula sampaiona* subsp. *lusitanica* V, *Ulex australis* subsp. *welwitschianus* V, *Helichrysum picardi* var. *virescens* IV, *Armeria royana* II, *Lithodora prostrata* subsp. *lusitanica* II, *Corema album* II, *Malcolmia lacera* subsp. *gracillima* II, *Dianthus broteri* subsp. *hioxianus* II, *Cistus salviifolius* I, *Iberis linifolia* subsp. *welwitschii* I, *Euphorbia boetica* +, *Cistus libanotis* r, *Armeria pinifolia* r; **companions:** *Cladonia potentosa* III, *Cladonia mediterranea* III, *Arrhenatherum album* III, *Conyza bonariensis* III, *Pinus pinaster* II, *Corynophorus canescens* var. *maritimus* II, *Carlina corymbosa* II, *Santolina impressa* II, *Sedum sediforme* II, *Euphorbia portlantica* II, *Daphne gnidium* II, *Pinus pinea* II, *Eleasolinum gummiferum* I, *Dittrichia viscosa* subsp. *viscosa* I, *Juniperus navicularis* I, *Pimpinella villosa* I, *Asparagus aphyllus* +, *Quercus suber* +, *Cytisus grandiflorus* +, *Rosmarinus officinalis* +, *Anemone palmata* +, *Scrophularia frutescens* +, *Calluna vulgaris* r, *Thapsia villosa* r, *Sesamoides canescens* r, *Fritilaria lusitana* subsp. *stenophylla* r, *Retama monosperma* r, *Genista triacanthos* r, *Cistus psilosepalus* r.

Synthetic table of **Salvio sclareoidis-Ulicetum densi thymetosum sylvestris** Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa ex Capelo, J.C. Costa, Lousã & Neto 1992 (*Serratulo estremadurensis-Thymenion sylvestris*, *Saturejo-Thymbrion capitatae*, *Rosmarinetalia officinalis*, *Rosmarineta officinalis*), from Capelo et al. 1993, 10 relevés: **Characteristics:** *Ulex densus* V, *Thymus zygis* subsp. *sylvestris* V, *Salvia sclareoides* V, *Rosmarinus officinalis*, *Sideritis hirsuta* var. *hirtula* IV, *Stahelina dubia* IV, *Serratula baetica* subsp. *lusitana* III, *Avenula occidentalis* III, *Phagnalon rupestre* III, *Fumana thymifolia* II, *Cistus albidus* II, *Thymbra capitata* II, *Micromeria graeca* subsp. *micrantha* II, *Anthyllis vulneraria* subsp. *maura* II, *Serratula estremadurensis* I, *Bartsia aspera* I, *Iberis procumbens* subsp. *microcarpa* I, *Helianthemum organifolium* I, *Valleriana tuberosa* I, *Cistus x pulverulentus* I, *Nepeta multibracteata* I; **Companions:** *Brachypodium phoenicoides* V, *Daphne gnidium* V, *Lavandula luisieri* IV, *Carex hallerana* IV, *Eryngium dilatatum* IV, *Centaurium erythraea* subsp. *grandiflorum* IV, *Cistus salviifolius* IV, *Bupleum rigidum* subsp. *paniculatum* IV, *Asparagus aphyllus* IV, *Pistacia alentiscus* IV, *Smilax aspera* var. *aspera* IV, *Cistus monspeliensis* III, *Dactylis hispanica* III,

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Quercus coccifera III, *Rubia peregrina* var. *longifolia* III, *Juniperus turbinata* III, *Rhamnus oleoides* III, *Euphorbia portlantica* III, *Helichrysum stoechas* II, *Olea europeae* var. *sylvestris* II, *Genista tournefortii* II, *Phlomis purpurea* II, *Phillyrea angustifolia* II, *Lonicera implexa* II, *Daucus crinitus* II, *Hyparrhenia sinaica* II, *Reichardia intermedia* II, *Cistus crispus* II, *Astragalus lusitanicus* II, *Convolvulus altheoides* II, *Anagallis monelli* var. *linifolia*, *Carlina corymbosa* II, + *Narcissus bulbocodium* subsp. *obesus* II, *Sanguisorba minor* subsp. *spachiana* II, *Reichardia picrioides* II, *Phlomis lychnitis* II, *Urginea maritima* II, *Pulicaria odora* II, *Stipa gigantea* II, *Pallenis spinosa* II, *Brachypodium distachyon* II, *Tulipa australis* I, *Rhamnus alaternus* I, *Plantago serraria* I, *Atractylis gummifera* I, *Scabiosa atropurpurea* I, *Cynara cardunculus* I, *Allium paniculatum* I, *Santolina rosmarinifolia* I, *Serapias vomeracea* I, *Schoenus nigricans* I, *Cheirolophus sempervirens* I, *Sanguisorba ancestris* I, *Erica scoparia* I, *Melica minuta* subsp. *arrecta* I, *Bituminaria bituminosa* I, *Phagnalum saxatile* I.

Synthetic table of ***Carici depressae-Hyparrhenietum sinaicae*** Br.-Bl., P. Silva & Rozeira 1956 corr. J.C. Costa, Capelo, Lousã & Espírito Santo 2002 (*Hyparrhenion sinaicae*, *Hyparrhenetalia hirtae*, *Lygeo-Stipetea*), from Costa et al. 1994, 20 releves: **Characteristics:** *Hyparrhenia sinaica* V, *Phagnalon saxatile* V, *Dactylis hispanica* V, *Reichardia picrioides*, *Convolvulus altheoides* V, *Asphodelus lusitanicus* IV, *Bituminaria bituminosa* III, *Erygium dilatatum* III, *Thapsia vilosa* II, *Daucus crinitus* II, *Salvia sclareoides* II, *Brachypodium phoenicoides* II, *Gynadrisis sisyrinchium* II, *Micromeria graeca* II, *Plantago serraria* II, *Anacamptis pyramidalis* I, *Lathyrus ocrus* I, *Carex depressa* +, *Pseudarthenateum pallens* +; **companions:** *Foeniculum vulgare* subsp. *pipeperitum* V, *Urginea maritima* V, *Oxalis pes-caprae* V, *Piptaterum mileaceum* IV, *Reichardia intermedia* IV, *Asphodelus fistulosus* IV, *Salvia verbenaca* III, *Asparagus albus* III, *Verbascum sinuatum* III, *Cynara humilis* III, *Atractylis gummifera* III, *Lobularia maritima* II, *Ononis natrix* subsp. *hispanica* II, *Paronychia argentea* II, *Asparagus aphyllus* II, *Scorpiurus muricatus* II, *Sedum album* II, *Brachypodium distachyon* II, *Sanguisorba spachiana* I, *Echium tuberculatum* I, *Ruta calepensis* I, *Thymra capitata* I, *Vicia sativa* I, *Anthyllis vulneraria* subsp. *maura* I, *Delphinium plantagineum* I, *Campanula rampunculus* I, *Vicia lutea* +, *Silene vulgaris* +, *Narcissus bulbocodium* subsp. *obesus*.

Relevée of ***Phlomido lychnitidis-Brachypodietum phoenicoidis*** Br.-Bl., P. Silva & Rozeira 1956 (*Brachypodion phoenicoidis*, *Brachypodietalia phoenicoidis*, *Festuco-Brometea erecti*), El Carmen, 50 m², NW, 220 m: **Characteristics:** 3 *Brachypodium phoenicoides*, 2 *Dactylis hispanica*, 2 *Erygium dilatatum*, 1 *Mantisalca salmantica*, 1 *Plantago serraria*, 1 *Salvia sclareoides*, 1 *Asphodelus lusitanicus*, 1 *Allium roseum*, 1 *Daucus crinitus*, 1 *Anthyllis vulneraria* subsp. *maura*, + *Ophrys lutea*, + *Phlomis lychnitis*, + *Lathyrus amphicarpos*, + *Aceras anthropophorum*, + *Anacamptis pyramidalis*, + *Convolvulus altheoides*, + *Urginea maritima*, + *Fritilaria lusitanica*, + *Narcissus bulbocodium* subsp. *obesus*, + *Phleum bertolonii*; **companions:** 1 *Cynodon dactylon*, 1 *Plantago lanceolata*, 1 *Bupleurum rigidum* subsp. *paniculatum*, 1 *Rosmarinus officinalis*, + *Carex hallerana*, + *Campanula rampunculus*, + *Pulicaria odora*, + *Asparagus aphyllus*, + *Cynara humilis*, + *Phalaris caerulea*, + *Agrotis stolonifera*, + *Anagallis arvensis* var. *linifolia*, + *Sanguisorba minor* subsp. *spachiana*, + *Thymus zygis* subsp. *sylvestris*, +

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Cistus albidus, + *Cistus salviifolius*, + *Nepeta tuberosa*, + *Scabiosa atropurpurea* var. *villosa*, + *Centaurium erythraea* subsp. *grandiflorum*.

Relevée of **Iberido microcarpae-Stipetum offnerii** Rivas-Martínez, Lousã, T.E. Díaz, Fernández-González & J.C. Costa 1990 (*Thero-Brachypodium retusum*, *Lygeo-Stipetalia*, *Lygeo-Stipetea*): Serra do Risco, 4 m², SW, 250 m, from Rivas-Martínez *et al.*, 1990: **Characteristics**: 3 *Stipa offnerii*, 1 *Ornithogalum concinnum*, 1 *Sedum sediforme*, 1 *Phagnalon saxatile*, 1 *Gladiolus reuteri*, 1 *Brachypodium retusum*, + *Iberis procumbens* subsp. *microcarpa*, + *Dactylis hispanica*, + *Narcissus calcicola*; **Companions**: 1 *Arisarum vulgare* var. *clusii*, 1 *Hyacintoides hispanica*, + *Asphodelus aestivus*, + *Astragalus lusitanicus*, + *Rosmarinus officinalis*, + *Fumana laevipes*, + *Gennaria diphylla*, + *Sedum album* var. *micranthum*, + *Valantia hispida*, + *Calendula suffruticosa* var. *algarbiensis*, + *Urginea maritima*, + *Galium verrucosum*.

Synthetic table of **Avenulo sulcatae-Stipetum giganteae** Capelo, J.C. Costa, Lousã & Espírito Santo in. J.C. Costa, Capelo, Lousã & Espírito Santo 2002 (*Agrostio castellanae-Stipion giganteae*, *Agrostietalia castellanae*, *Stipo giganteae-Agrostietea castellanae*), from Costa *et al.* 1992, 9 releves: **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, *Quercus lusitanica* III, *Anthyllis gerardi* II, *Asparagus aphyllus* II, *Briza maxima* II, *Lagurus ovatus* II, *Ulex minor* II, *Brachypodium sylvaticum* II, *Euphorbia characias* II, *Plantago afra* I, *Plantago coronopus* I,

Synthetic table of **Corynephero macranthero-Arenarietum algarbiense** P. Silva & Teles ex Rivas-Martínez & Izco 2002 (*Anthyllido hamosae-Malcolmion lacerae*, *Malcolmietalia*, *Tuberarietea guttatae*), from Neto, 2002, 28 releves: **Characteristics**: *Corynephorus macrantherus* V, *Rumex bucephalophorus* subsp. *hispanicus* V, *Erodium aethiopicum* subsp. *pilosum* V, *Tuberaria guttata* V, *Linaria spartea* V, *Hypochaeris glabra* V, *Logfia gallica* V, *Silenes cabriflora* IV, *Polycarpon alsinifolium* IV, *Astrolinum linum-stellatum* III, *Micropyrum tenellum* III, *Loeflingea baetica* var. *micrantha* III, *Leucojum tricophyllum* II, *Silene littorea* II, *Coronilla repanda* subsp. *repanda* II, *Aira caryophyllea* II, *Briza maxima* II, *Anthyllis hamosa* II, *Malcolmia lacera* subsp. *gracilima* II, *Ononis baetica* II, *Silene colorata* II, *Mibora minima* II, *Jasione montana* II, *Pimpinella villosa* II, *Euphorbia exigua* II, *Arenaria algarbiense* I, *Vulpia membranacea* I, *Ononis broteriana* I, *Ornithopus isthmocarpus* I, *Tolpis barbata* I, *Ornithopus pinnatus* I, *Evax pygmaea* subsp. *ramosissima* +, *Campanula lusitanica* subsp. *matritensis* +, *Ionopsidium acaule* +, *Lotus castellanus* +, *Paronychia cymosa* +, *Arenaria conimbricensis* r, *Agrostis tenerima* r, *Loeflingia taveresiana* r, *Logfia gallica* r, *Lathyrus angulatus* r; **companion**: *Secio gallicus*

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IV, *Spergularia purpurea* IV, *Vulpia alopecurus* III, *Spergula arvensis* III, *Juncus capitatus* III, *Bromus rigidus* III, *Avena longiglumis* II, *Euphorbia portlantica* II, *Sesamoides canescens* II, *Centranthus calcitrapa* II, *Corynophorus canescens* var. *maritimus* II, *Silene gallica* II, *Lupinus angustifolius* subsp. *reticulatus* II, *Papaver setigerum* II, *Dipeca di serotinum* I, *Carduus meoanthus* I, *Raphanus raphanistrum* I, *Chamaemelum mixtum* I, *Brassica barrelieri* subsp. *oxyrrhina* I, *Arrhenatherum album* +, *Avena barbata* +, *Anagallis arvensis* +, *Stellaria media* +, *Anarrhinum belidifolium* +, *Anemone palmata* +, *Centaurea sphaerocephala* +, *Silene nicaensis* +, *Scilla monophyllus* +, *Papaver rhoeas* +, *Paronychia argentea* +, *Rumex angiocarpus* +, *Radiola linoides* r, *Galium minutulum* r.

Relevée of ***Leucanthemo sylvatici-Cheirolophetum sempervirentis*** J.C. Costa, Ladero, T.E Díaz, Lousã, Espírito Santo, Vasconcelos, Monteiro & Amor 1993, at Mata do Solitário, 8 m², SE, 210 m: (*Stachydo lusitanicae-Cheirolophenion sempervirentis*, *Origanion virentis*, *Melampyro-Holcetalia*, *Trifolio-Geranietea*) **Characteristics:** 4 *Cheirolophus sempervirens*, 2 *Picris spinifera*, 1 *Teucrium scorodonia* subsp. *scorodonia* 1 *Origanum virens*, 1 *Clinopodium vulgare* subsp. *arundanum*, 1 *Vinca difformis*, 1 *Calamintha baetica*, 1 *Sedum forsteranum*, + *Campanula rampunculus*, + *Stachys germanica* subsp. *lusitanica*, **Companions:** 2 *Brachypodium phoenicoides*, 1 *Geranium purpureum*, + *Salvia sclareoides*, + *Arisarum vulgare* var. *clusii*, + *Bituminaria bituminosa*.

Relevée of ***Sileno longicilae-Antirrhinietum linkianum*** Ladero, Valle, M.T. Santos, Amor, Espírito Santo, Lousã & J.C. Costa 1991 (*Calendulo lusitanicae-Antirrhinion linkiani*, *Phagnalo saxatilis-Rumicetalia indurati*, *Phagnalo-Rumicetea induratae*), Serra Arrábida near Convento, 2 m², NE, 320 m, **Characteristics:** 2 *Antirrhinum linkianum*, 1 *Biscutella lusitanica*, 1 *Calendula suffruticosa* subsp. *lusitanica*, 1 *Phagnalon saxatile*, 1 *Sanguisorba multiculmis*, 1 *Melica minuta* + *Silene longicilia*, + *Arabis sadina*, + *Sedum album* var. *micranthum*; **Companions:** 1 *Bituminaria bituminosa*, 1 *Hyparrhenia sinaica*, + *Reichardia picrioides*, + *Sedum sediforme*.

Relevée of ***Narciso calcicolae-Asplenietum ruta murariae*** Espírito Santo, Ladero & Lousã 1995 (*Asplenion petrachae*, *Asplenetalia petrachae*, *Asplenietea trichomanis*) Serra da Arrábida near antennas, 2m², SW, 485 m, **Characteristics:** 2 *Narcissus calcicola*, 1 *Melica minuta*, 1 *Asplenium petrachae*, + *Phagnalon rupestre*, + *Asplenium ceterach*, + *Asplenium trichomanes*, + *Sanguisorba ancistroides*; **companions:** + *Arabis sadina*, + *Calendula suffruticosa* subsp. *lusitanica*.

Synthetic table of ***Helianthemo stoechadifoliae-Limonietum virgatae*** J.C. Costa, Lousã & Capelo in Aguiar, J.C. Costa, Capelo, Amado, Honrado, Espírito Santo & Lousã 2003 (*Crithmo-Daucion halophilii*, *Crithmo-Limonietaia*, *Crithmo-Limonietaea*), from Costa *et al.* 1998, 9 relevees: **Characteristics:** *Limonium virgatum* V, *Helianthemum apeninum* subsp. *stoechadifolia* V, *Daucus halophilus* V, *Dactylis marina* V, *Crithmum maritimum* V, *Plantago coronopus* subsp. *occidentalis* IV, *Frankenia laevis* IV,

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Spergularia australis II, *Carlina corymbosa* subsp. *major* II, *Armeria pungens* subsp. *major* I, *Helichrysum decumbens* I; **companions:** *Euphorbia portlantica* V, *Helianthemum marifolium* V, *Calendula suffruticosa* subsp. *algarbiensis* IV, *Sedum sediforme* V, *Catapodium marinum* V, *Lobularia maritima* III, *Crucianella maritima* III, *Lotus creticus* III, *Parapholis incurva* III, *Rosmarinus officinalis* III, *Echium tuberculatum* III, *Astericus maritimus* III, *Atriplex halimus* II, *Brachypodium phoenicoides* II, *Eleaescholium gummiferum* II, *Beta maritima* II, *Asparagus aphyllus* II, *Salsola vermiculata* II, *Pallenis spinosa* II, *Hordeum marinum* II, *Erygium dilatatum* II, *Cistus salviifolius* II, *Daphne gnidium* var. *maritima*, II, *Asperula scabra* II, *Juniperus turbinata* II, *Asperula scabra* II, *Carpobrotus edulis* I, *Anagallis monelli* var. *microphylla* I, *Thymus zygis* subsp. *sylvestris* I, *Mesembryanthemum nodiflorum* I, *Mucozonia hispida* I, *Thapsia villosa* I.

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