ISSN 2704-6192 (Online) ISSN 2280-1855 (Print)

PLANT SOCIOLOGY

formerly FITOSOCIOLOGIA

Volume 56 (2) - December 2019

RIVISTA SEMESTRALE - POSTE ITALIANE S.P.A. - SPED. ABB. POST. - D.L. 353/2003 - (CONV. IN L. 27/02/2004 N. 46) ART. 1, COMMA 2, DCB ANCONA TASSA RISCOSSA-TAXE PERÇUE-CMPP AN
EDITO DALLA SOCIETA' ITALIANA DI SCIENZA DELLA VEGETAZIONE ONLUS - PAVIA - DIRETTORE RESPONSABILE. D. GIGANTE - VOLUME 2 - II° SEMESTRE 2019

Journal of the Italian Society for Vegetation Science

Plant Sociology, Vol. 56, No. 2, December 2019, pp. 3-34
DOI 10.7338/pls2019562/01

PLANT SOCIOLOGY

The *Olea europaea* L. var. *sylvestris* (Mill.) Lehr. forests in the Mediterranean area

L. Gianguzzi[1], G. Bazan[2]
[1]*Department of Agricultural*, *Food and Forest Sciences*, *University of Palermo*, *Palermo*, *Italy.*
[2]*Department of Biological*, *Chemical*, *and Pharmaceutical Sciences and Technologies*, *University of Palermo*, *Palermo*, *Italy.*

Lorenzo Gianguzzi https://orcid.org/0000-0002-9007-7604, Giuseppe Bazan https://orcid.org/0000-0002-4827-9579

Abstract
This paper examines the forest communities dominated by *Olea europaea* L. var. *sylvestris* (Mill.) Lehr. that have been described up until now in the Mediterranean Region (including other isolated extrazonal areas in the northwestern Iberian Peninsula and in Northern Turkey) as more or less evolved aspects of woods, microwoods and high maquis that principally tend to make up climacic and edapho-climacic "series heads". These formations maintain a significant large-scale distributive potential within the infra- and thermomediterranean bioclimate belts (with a few penetrations into the mesomediterranean) with a dry-subhumid (and sometimes humid) ombrotype; however, they are currently quite rare and fragmented in the wake of large-scale deforestation and the impoverishment of old-growth communities dominated by a species known to live for millennia. The study was conducted through the analysis of phytosociological data taken from the scientific literature and other unpublished data regarding North-Africa (Morocco, Algeria), the Iberian Peninsula, the Balearic Islands as well as other islands from the Tyrrhenian area (Sardinia, Corsica, Sicily and its minor islands), the Italian Peninsula, the Balkan Peninsula, the Aegean region, Turkey and the southern Anatolian coast. A comparison between the different communities has shown a high floristic and physiognomic-structural homogeneity that justifies their categorization in the *Quercetea ilicis* class. The biogeographic and ecologic vicariance shown by the same formations within the large Mediterranean distribution range makes it possible to subdivide them into the following orders and alliances: 1) *Pistacio-Rhamnetalia alaterni* [A) all. *Tetraclini articulatae-Pistacion atlanticae* (suball. *Pistacienion atlanticae*); B) all. *Asparago albi-Rhamnion oleoidis*; C) all. *Oleo sylvestris-Ceratonion siliquae*]; 2) *Quercetalia calliprini* [D) all. *Ceratonio-Pistacion lentisci*]; 3) *Quercetalia ilicis* [E) all. *Querco rotundifoliae-Oleion sylvestris*; F) all. *Fraxino orni-Quercion ilicis*; G) all. *Erico arboreae-Quercion ilicis*; H) all. *Arbuto unedonis-Laurion nobilis* (suball. *Arbuto-Laurenion nobilis*)]. Regarding the syntaxonomical aspect: (i) two new associations are described [*Hippocrepido emeroidis-Oleetum sylvestris* and *Junipero foetidissimae-Oleetum sylvestris*]; (ii) two new associations [*Phillyreo latifoliae-Oleetum sylvestris* Barbero, Quézel & Rivas-Martínez ex Gianguzzi & Bazan ass. nova and *Calicotomo intermediae-Oleetum sylvestris* Quézel, Barbero, Benabid, Loisel & Rivas-Martínez 1988 ex Gianguzzi & Bazan ass. nova] and a new subassociation [*Aro neglecti-Oleetum sylvestris* Rivas-Martínez & Cantò 2002 corr. Rivas-Martínez & Cantò *fraxinetosum angustifoliae* Pérez Latorre, Galán de Mera, Deil & Cabezudo ex Gianguzzi & Bazan subass. nova] are leptotypified; (iii) a *nomen novum* of the association is redefined [*Rhamno laderoi-Oleastretum sylvestris* (Cantò, Ladero, Perez-Chiscano & Rivas-Martínez 2011) Gianguzzi & Bazan nom. nov.].

Key words: biogeography, Mediterranean vegetation, phytosociology, synchorology, syntaxonomy.

Introduction

The Oleaster (wild olive tree) [*Olea europaea* L. var. *sylvestris* (Mill.) Lehr.] is a woody plant species that characterizes the Mediterranean landscape, where it is an emblematic component of natural forest and maquis vegetation. It is a slow-growing tree that can become up to 15-20 meters tall. It adapts well to many varied geopedological substrates (limestone, dolomite, marl, gypsum, calcarenite, vulcanite, vertisols, etc.), showing significant climacic potentiality in the most xeric areas of the entire biogeographic region. Here, it colonizes coastal and even hill stations, where it prefers sites with a southern exposure, including those that are dry and xeric; it is also lithophilic, because it is equipped with a robust root structure that penetrates the soil quite deeply, pushing between the cracks in the rocks (Arrigoni, 1968; Rivas-Martínez *et al*., 2001, 2002).

Although this tree is well known for living for thousands of years, it rarely forms old-growth forests; in fact, natural Oleaster communities have been subjected to extensive deforestation, causing clear losses both in terms of area and quantitative biomass measurements. This deforestation began as early as the post-Neolithic colonizations (Liphschitz *et al*., 1991), when man freed up large tracts of land in order to adapt them to agriculture or animal husbandry, thus changing the landscape's features; furthermore, due to the high heat-producing capacity of Oleaster wood, it has always been heavily used for heating as well as for the most ancient archaeometallurgical activities connected to the various phases of metalworking (Primavera & Colaianni, 2011; Panno *et al*., 2008). Consequentially, only sporadic testimonials of the oldest-growth primary communities can be found today. The monumental oleasters of Luras in Sardinia (Olbia Tempio province) are one example; one specimen – estimated to be about

Corresponding author: Lorenzo Gianguzzi. *Department of Agricultural*, *Food and Forest Sciences*, *University of Palermo*, *Palermo*, *Italy; e-mail: lorenzo.gianguzzi@unipa.it*

4,000 years old and with a trunk circumference of over 11 meters – is in fact considered to be the oldest tree in Italy (Lisai & Maccioni, 2017). Another example is the "Inveges' Oleaster", a large wild olive plant, which has a height of 13 meter with a vigorous trunk of 4.60 m in circumference at breast height, located in the countryside of Sciacca (Sicily) (Bazan & Marino, 2016).

In agricultural areas, the climacic potentiality of Oleaster communities has long been exploited by the most ancient indigenous civilizations to renew trees and convert them into productive olive trees (*Olea europaea* var. *europaea*) to produce both olives and olive oil for both religious and food uses (Bartolini *et al*., 2002; Pignatti, 2018). Furthermore, *Olea europaea* var. *sylvestris* was the rootstock on which the various selected cultivars were propagated – well over 300 are listed just in Sicily (Caruso *et al*., 2014) –, thus making it possible to expand its cultivation areas and diversify production in the various areas of the Mediterranean basin. In the century-old olive trees present in the oldest orchards, – whose trunk is Oleaster – the typical hyperplasia of the stem at the historic grafting point is emblematic in this respect; it is a significant testimony of the ancient interconnection at the foundation of this ancient Mediterranean crop (Zohary & Spiegel-Roy, 1975; Pignatti, 1983; Marcuzzi, 1996), which is a living symbol of the same millennial civilization. In the Mediterranean landscape, groups of shrub *Olea europaea* var. *sylvestris* are frequent in abandoned farmland. They evolve from historic plantings that were abandoned or burned, thus allowing suckers to grow from the old rootstock.

Thus, the current distribution range of *Olea europaea s.l.* tends to make up the distribution range of the aforementioned varieties (Fig. 1), with a greater concentration in the Central-Western part of the Mediterranean basin. The same distribution range includes North-Africa (Morocco, Algeria, Tunisia and Libya, with an island in the Benghazi area), the Central-southern part of the Iberian Peninsula (up to the French coast), the various central Mediterranean and Tyrrhenian islands (the Balearic Islands, Sicily, Sardinia and Corsica) and the southern part of the Italian Peninsula. It continues to be frequent along the coasts of the Balkan Peninsula, the Aegean area – including the islands of Crete and Cyprus (Brullo *et al*., 2004) – up to the shores of the Black Sea to the east, then heading southwards towards southern Anatolia, reaching Lebanon, Jordan and Israel [Meusel & Jager, 1998; Gianguzzi & Bazan, 2019a].

In addition to the forest formations in which *Olea europaea* var. *sylvestris* physiognomically dominates – the entity in discussion also takes part in other woodland communities, as well as in secondary scrub and garrigue coenoses, as a gregarious entity. This tends to enhance its climacic potentiality throughout the Mediterranean, favored by seed dispersal via ornithochory or other forms of zoochory by the various organisms that eat the seeds, including man. Given this widespread frequency in secondary aspects as well, *Olea europaea* var. *sylvestris* is often been used by phytosociologists as first epithet in the names of several associations. For example, this is the case for the *Pistacia lentiscus* scrub ascribed to *Oleo-Lentiscetum s.l.* (Braun-Blanquet & Maire, 1924; Molinier 1954;

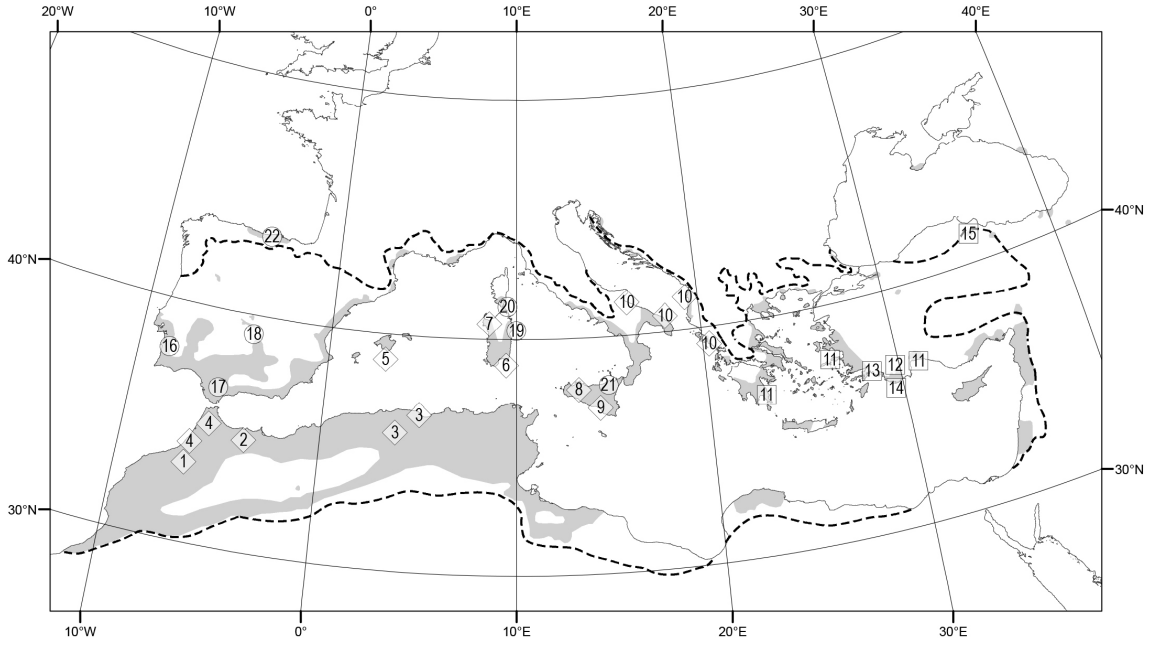


Fig. 1 - Distribution range of *Olea europaea* var. *sylvestris* (grey area) and boundaries of Mediterranean Region (dotted line) from Vargasi and Kadereit (2001, redrawn); numbers refer to the associations that have been described in the Mediterranean area up to now marked now and correspond to numbers reported in online Appendix I and Tab. 1.

Trinajstic, 1973, 1984a, etc.)] and for *Euphorbia dendroides* scrub belonging to *Oleo* (*oleastri*)-*Euphorbietum dendroidis* (Trinajstic, 1973, 1984a)]. These plant communities are widely distributed along the coasts of the Mediterranean area, as secondary or recovery aspects that occur throughout the entire basin, prompting some authors to propose their subdivision into multiple geographic synvariants ("races géographiques"), described for various regional areas (e.g., Gehù & Biondi, 1997). In any case, the constant, widespread presence of *Olea europaea* var. *sylvestris* in the Mediterranean area shows its important syndynamic role towards Oleaster forest communities. These communities might also be expressions of series' heads, however, due to the structural degradation caused by human activity, they have not always been recognized and described as forest formation (woods or microwoods).

Regarding the phytosociological interpretation of mature forest expressions of Oleaster distributed throughout the Mediterranean basin, many associations have already been described; in particular, they regard North-Africa (Barbero *et al*., 1981; Quézel *et al*., 1988; Amara, 2014), the Iberian Peninsula – in Spain (Bueno Sánchez & Fernádez Prieto 1991, Galan de la Mera, 2000, Rivas-Martínez 2002, Rivas-Martínez *et al*., 2002, Cantò *et al*., in Rivas-Martínez *et al*., 2011) and Portugal (Costa *et al*., 1994) –, the Balearic islands (Bolòs & Molinier, 1969; Bolòs, 1996), Sardinia (Bacchetta *et al*., 2003), Corsica (Paradis *et al*., 2014), Turkey (Vural *et al*., 1995, Karaer *et al*., 2010, Korkmaz, 2011, Kurt *et al*., 2015) and most recently, Sicily (Gianguzzi *et al*., 2019).

Following the same approach, and partially based on the same field data from Gianguzzi *et al*., (2019), this study aims to define a syntaxonomical panorama of the coenoses identified throughout the whole Mediterranean area, through a synoptic comparison of the various associations and subassociations described so far, aiming to characterize the main biogeographical and ecological aspects that determine the floristic-phytosociological variations in the different regional areas.

Materials and methods

Study area and vegetation data

In order to reconstruct an updated synoptic framework for the Oleaster forest formations of the Mediterranean area, representative phytosociological surveys from the literature were selected and analyzed together with other data collected by this research team, partly recently published by Gianguzzi & Bazan (2019a, 2019b) and partly unpublished (i.e. Tab 2, rels. 1-2). These surveys were spread out over the entire area that potentially regards the Oleaster forest formations, ranging from 41°12'N to 33°22'N latitude and from 6°33'W to 35°27'E longitude. In order to be included in the aforementioned survey set, stands were required to be high scrub, forests or micro-forests clearly dominated by *Olea europaea* var. *sylvestris* with coverage values ≥ 4 (using the Braun-Blanquet scale), with an average vegetation height of ≥ 3-3.5 m, representing the most dynamically evolved aspects of the vegetation, i.e. as close as possible to the series head.

The considered formations regard North-Africa [Morocco (Barbero *et al*., 1981, Quézel *et al*., 1988, Benabid (1984), Amara 2014) and Algeria (Géhu *et al*., 1992, 1994; Quézel & Santa, 1962-63)], Spain (Bueno Sánchez & Fernádez Prieto, 1991; Galan de Mera *et al*., 2000; Rivas-Martínez, 2002, Rivas-Martínez *et al*., 2002; Cantò *et al*., in Rivas-Martínez *et al*., 2011), Portugal (Costa *et al*., 1994; Neto *et al*., 2009), the Balearic Islands (Bolòs & Molinier, 1969; Bolòs *et al*., 1970), Sardinia (Bacchetta *et al*., 2003), Corsica (Paradis *et al*., 2014), Sicily (Gianguzzi *et al*., 2019), The Balkan Peninsula (Trinajstic, 1984), Albania (unpublished data), Greece (Biondi & Gehu, 1987), Mediterranean Turkey (Quézel *et al*., 1978; Géhu *et al*.,1988; Arkman *et al*., 1978; Vural *et al*., 1995, Kurt *et al*., 2015; Karaer *et al*., 2010) and the Black Sea Region (Korkmaz, 2011). The complete data set consists of 330 relevés and the complete list of syntaxonomical references, locations and bibliographic sources are shown in the Appendix I available in the online Supplementary material.

The online database "The Plant List" (2013) and, in some cases, the Euro+Med Plantbase (Euro+Med, 2006-2019) were used for taxa nomenclature.

The "Biogeographic Map of Europe" (Rivas-Martínez *et al*., 2004) was used as a guide for biogeographic regionalization. The phytosociological nomenclature follows the "International Code of Phytosociological nomenclature" (Weber *et al*., 2000); the nomenclature of sigmataxa refers to Rivas-Martínez (2005).

For each *Olea europaea* var. *sylvestris* coenoses analyzed, a schematic description of the structural, floristic, ecological and syntaxonomical characters is given. The "Short description" of orders and alliances is focused only on Oleaster formations.

Some pictures of *Olea europaea* var. *sylvestris* coenoses and their typical species are available in Figs. 3 and 4 in the online Supplementary material.

Data analysis

Based on the total set of phytosociological data, a synoptic matrix of 40 tables ×340 species was obtained. The matrix was analyzed statistically through the Principal component analysis (PCA), on pre-transformed species composition data using the Hellinger transformation, implemented in the RStudio (Version 1.1.463) free software with the Vegan package (Oksanen *et al*., 2013). The statistical analysis matrix has been defined considering only "presence/absence of species", in or-

der to highlight the diversity and floristic arrangement of the phytocoenoses.

To describe the correlation among environmental factors and communities, bioclimatic variables were projected into the space of ordination diagram by performing a multiple regression with the Vegan R package's "envfit" function (Oksanen, 2015). The bioclimatic indices [*T* - Mean annual temperature (°C); *Pp* - Annual positive precipitation (mm); *Itc* - Compensated thermicity index; *Io* - Annual ombrothermic index; *Ic* - Simple continentality index] were calculated following Rivas-Martínez *et al*. (2011) using the "Climatologies at high resolution for the Earth's land surface (CHELSA)" dataset as source data (Karger *et al*., 2017).

To evaluate the correspondence between the distribution of the Oleaster formations and bioclimatic types, we have performed a GIS analysis to build a new "Bioclimatic map of Mediterranean area" using GRASS GIS 7.6. Analytical and dichotomous keys for the definition of bioclimatic classes performed by the "Worldwide bioclimatic classification system" (Rivas-Martínez *et al*., 2011) were translated into GRASS GIS scripts to compute the bioclimatic parameters and indices.

Results

The comparison among the analyzed communities dominated by *Olea europaea* var. *sylvestris* throughout the entire Mediterranean area has shown that their remarkable floristic and physiognomic-structural homogeneity justifies their collocation in the class *Quercetea ilicis* (Barbero *et al*., 1981; Rivas-Martínez *et al*., 2001; Brullo *et al*., 2008; Biondi *et al*., 2014, etc.). In this frame, bio-geographic and ecological vicariance gives rise to subdivisions into different orders (*Pistacio-Rhamnetalia alaterni*, *Quercetalia calliprini* and *Quercetalia ilicis*) and alliances, as shown in the following syntaxonomical outline.

A prospectus of the analyzed communities is reported in the online Appendix I, while published and unpublished phytosociological data are shown in Tables 1 and 2. Some pictures and maps illustrating the described vegetation types are reported in the Appendix II (available in the online Supplementary material) and in Figs. 1 and 2, while the results of the PCA are shown in Tab. 3 and Fig. 3. A brief description of the detected syntaxa is given after the syntaxonomical scheme.

Some syntaxa reported here have been described in a paper currently in press (Gianguzzi & Bazan, 2019a). The identifier represented by the DOI identification code will allow a univoque connection with the mentioned paper. They are indicated here with the reference "Gianguzzi & Bazan 2019".

Regarding the syntaxonomical framework of the analyzed Oleaster communities, the adopted scheme refers mainly to Mucina *et al*. (2016), with the only exception of the syntaxa ascribed to *Ceratonio-Pistacion lentisci*, here referred to the *Quercetalia calliprini* instead of *Pistacio lentisci-Rhamnetalia alaterni* Rivas-Martínez 1975 (according to Zohary & Orshan, 1959).

Cl. – *QUERCETEA ILICIS* Br.-Bl. in Br.-Bl., Roussine & Nègre 1952

1. Ord. *PISTACIO LENTISCI-RHAMNETALIA ALATERNI* Rivas-Martínez 1975

Short description of the aspects here considered – Woods, micro-woods and high scrub dominated by *Olea europaea* var. *sylvestris* linked to the infra- and thermomediterranean bioclimatic belts with ombrotype between lower sub-humid – semiarid and lower subhumid, with penetrations into the meso-Mediterranean. They are part of the following alliances – *Tetraclini articulatae-Pistacion atlanticae* (arid and semi-arid continental regions of the Maghreb), *Asparago albi-Rhamnion oleoidis* (Iberian-Maghreb regions from semi-arid to subhumid) and *Oleo sylvestris-Ceratonion siliquae* (carbonate substrates of the central Mediterranean area) (Rivas-Martínez *et al*., 2001, 2002; Bacchetta *et al*. 2004; Mucina *et al*., 2016).

Diagnostic species – Ampelodesmos mauritanicus, *Anagyris foetida*, *Arbutus unedo*, *Asparagus albus*, *Aristolochia navicularis*, *Asparagus aphyllus*, *Bupleurum fruticosum*, *Calicotome villosa*, *Celtis australis*, *Ceratonia siliqua*, *Cercis siliquastrum*, *Clematis cirrhosa*, *Ephedra foeminea* (= *E. campylopoda*), *Ephedra fragilis*, *Euphorbia characias*, *Euphorbia bivonae*, *Genista linifolia*, *Jasminum fruticans*, *Juniperus phoenicea* var. *turbinata*, *Lycium intricatum*, *Myrtus communis*, *Olea europaea* var. *sylvestris*, *Osyris alba*, *Phagnalon saxatile* var. *viride*, *Periploca laevigata* subsp. *angustfolia*, *Phlomis fruticosa*, *Pinus halepensis*, *Pistacia lentiscus*, *Pistacia terebinthus*, *Prasium majus*, *Punica granatum*, *Quercus coccifera* (=*Q. calliprinos*), *Rhamnus lycioides* subsp. *oleoides*, *Teucrium fruticans*, *Ziziphus lotus*, *Rhamnus alaternus*.

A) *TETRACLINI ARTICULATAE-PISTACION ATLANTICAE* Rivas-Martínez, Costa & Izco 1986

Short description – Pre-forest aspects, scrub and thermophilous to evergreen sclerophyllous woods of the arid and semiarid continental regions of the Maghreb (Morocco, Algeria and Tunisia), in the lower thermo- and mesomediterranean bioclimate belts, with an arid, semi-arid or dry ombrotype and continental character (Quézel & Barbero, 1986; Meddour, 2010).

Diagnostic species – Asparagus altissimus, *Astragalus chlorostachis*, *Pistacia atlantica*, *Searsia penthaphylla*, *Tetraclinis articulata*, *Teucrium atra-*

tum, *Withania frutescens* (Rivas-Martínez *et al*., 1986; Hadjadj-Aoul & Loisel, 1999; Meddour, 2010).

Syntaxonomic notes – Fennane (1988) suggests that the syntaxon is of dubious value, since it had been originally created to accommodate mainly Tetraclinis dominated associations. Hadjadj-Aoul & Loisel (1999) as well as Meddour (2010) have cited it for Algeria.

Suball. *PISTACIENION ATLANTICAE* Barbero, Quézel & Rivas-Martínez 1981

Short description – Scrub from semi-arid and continental areas of central Morocco (Barbero *et al*., 1981; Quézel & Barbero, 1986; Meddour, 2010). According to Meddour (2010) the sub-alliance should also be indicated for Algeria where *Pistacia atlantica* is absent, but *Rhamnus lycioides* subsp. *atlantica* is present, which is sub-endemic to the regions of Morocco and Algeria. The latter – not reported in Algeria by Quézel & Santa (1962-63) – is nonetheless indicated on limestone rocks by Jebel Ghoufi at Aurès (Maire, 1937).

Diagnostic species – Tetraclinis articulata, *Pistacia atlantica*, *Rhus pentaphylla*, *Asparagus altissimus*, *Rhamnus oleoides* subsp. *atlantica* (Barbero *et al*., 1981; Rivas-Martínez *et al*., 1986; Fenname 1988).

1) *PHILLYREO LATIFOLIAE-OLEETUM SYLVESTRIS* Barbero, Quézel & Rivas-Martínez ex Gianguzzi & Bazan ass. nova *hoc loco*

Synonyms – Phillyreo latifoliae-Oleetum sylvestris Barbero, Quézel & Rivas-Martinez 1981 *nom. inval.* (Art. 5, ICPN - Weber *et al*., 2000).

Lectotypus (designated here) – Rel. 3, Tab. 18, in Barbero *et al*. 1981 (Phytocoenol. 9(3), p. 358).

Syntaxonomic note – The association is lectotypified here, because it is described without indicating a *typus* (Barbero *et al*., 1981). Regarding syntaxonomy, the same authors initially placed it in the suballiance *Pistacienion atlanticae* – which in turn referred to the alliance *Asparago albidi-Rhamnion oleoidis* (*Pistacio lentisci-Rhamnetalia alaterni*, *Quercetea ilicis*) –, which was then transferred to the alliance *Tetraclini articulatae-Pistacion atlanticae* (Rivas-Martínez *et al*., 1986).

Phytosociological data – Tab. 1, col. 1 (from Barbero, Quézel & Rivas-Martínez 1981: Tab. 18).

Diagnostic species – Olea europaea var. *sylvestris* (dom.), *Phillyrea latifolia*, *Pistacia lentiscus*, *Pistacia atlantica*, *Searsia pentaphilla*, *Tetraclinis articulata*, *Astragalus chlorostachys*.

Short description – Microwoods and maquis dominated by *Olea europaea* var. *sylvestris*, 4-5 m high, typical of steep slopes, on colluvial soils, at altitudes between 300 and 700 m a.s.l. It is associated with various thermophilous elements (*Pistacia lentiscus*, *Phillyrea latifolia*, *Prasium maius*, *Asparagus albus*, *Clematis cirrhosa*, *Osyris quadripartita*, *Jasminum fruticosus*, *Lonicera implexa*, *Pulicaria odora*, etc.) and species from the suballiance *Pistacienion atlanticae* (*Pistacia atlantica*, *Searsia pentaphylla*, *Tetraclinis articulata*, *Astragalus chlorostachys*). The herbaceous layer is sparse and rich in epiphytic lichens.

Bioclimate – Mediterranean pluviseasonal-oceanic (thermomediterranean semi-arid).

Substrates – Schist, sandstone, quartzite, flysch, etc.

Vegetation series – Edapho-xerophilous, North-African (Moroccan-Atlantic), thermomediterranean semi-arid, verticicolous series of Oleaster (*Calicotomo intermediae-Oleo sylvestris* sigmetum).

Synchorology – North-Africa, in Morocco: Western slopes of impluvia that affect the Central Plateau, regions of Sidi Bettache (Kouriflat gorge, hinterland of the region of Khatouat; Barbero *et al*., 1981).

2) *CALICOTOMO INTERMEDIAE-OLEETUM SYLVESTRIS* Quézel, Barbero, Benabid, Loisel & Rivas-Martínez ex Gianguzzi & Bazan ass. nova *hoc loco*

Lectotypus (designated here) – Rel. 3, Tab. 8, in Quézel *et al*., 1988 (Ecol. Medit. 14, p. 106).

Phytosociological data – Tab. 1, col. 2 (from Quézel *et al*., 1988: Tab. 8).

Diagnostic species – Olea europaea var. *sylvestris* (dom.), *Tetraclinis articulata*, *Searsia pentaphilla*, *Asparagus altissimus*, *Withania frutescens*, *Calicotome infesta* subsp. *intermedia*, *Arisarum simorrhinum*, *Lycium intricatum*, *Rhamnus lycioides* subsp. *oleoides*.

Short description – Residual forest formation dominated by *Olea europaea* var. *sylvestris*, which is associated with *Pistacia lentiscus*, *Ephedra fragilis*, *Calicotome infesta* subsp. i*ntermedia*, as well as particular thermophilous elements, including *Withania frutescens*, *Lycium intricatum* and *Arisarum simorrhinum* (Quézel *et al*., 1988). In the coastal regions of eastern Morocco *Ballota nigra*, *Chamaerops humilis* and *Ziziphus lotus* are also present (Aimè, 1991; Amara, 2014).

Bioclimate – Mediterranean pluviseasonal-oceanic (thermomediterranean semiarid-dry).

Substrates – Marls, clays, shales, etc..

Vegetation series – Edapho-xerophilous, North-African (Moroccan-Algerian), thermo- and mesomediterranean semiarid-dry, verticicolous series of Oleaster (*Calicotomo intermediae-Oleo sylvestris* sigmetum).

Synchorology – Morocco (Eastern coastal zone, in the province of Al-Hoseyma; Amara, 2014) and Algeria (Tell Oranais; Aimè, 1991).

Syntaxonomic note – The association is lectotypified here, since it is described by Quézel *et al*. (1988) without indicating the *typus*; it is indicated for the coastal regions of eastern Morocco and included in the alliance *Tetraclini articulatae-Pistacion atlanticae*.

3) *BUPLEURO FRUTICOSI-EUPHORBIETUM DENDROIDIS* Géhu, Kaabeche & Gharzouli 1992

Holotypus – Rel. 2, Tab. 1 in Géhu *et al.* (1992, p. 317).

Syntaxonomic note – The association has been described by Géhu *et al*. (1992) as *Bupleuro* (*fruticosae*)-*Euphorbietum dendroidis*, based on a table with only three relevés. It should be noted that in two of them – including the holotypus indicated by the authors – the dominant entity is *Olea europaea* var. *sylvestris* (a woody layer species) and not *Euphorbia dendroides*. Although the described vegetation shows a partial degradation – depicted as "… parfois incendiées …" –, the formations are probably two different syndynamic aspects that tend towards an *Oleastretum s.l.* The physiognomic heterogeneity of the relevés in the table and the choice of the holotypus have led to a misinterpretation of the described vegetation and consequently the name *Bupleuro* (*fruticosae*)-*Euphorbietum* should be considered *nomen ambiguum* (ICPN, Art. 36 - Weber *et al*., 2000). Indeed, the table should be divided into 2 syntaxa of the same rank: one an *Oleetum*, as a forest vegetation series head; and the other, an *Euphorbietum*, as a secondary maquis aspect (ICPN, Art. 24 - Weber *et al*., 2000). However, given the lack of data, we prefer to not discuss the current nomenclature, which should be reconsidered after further phytosociological investigations in the same territory.

Phytosociological data – Tab. 1, col. 3a (from Géhu, Kaabeche & Gharzouli 1992: Tab. 1, rels. 2-3) and 3b (from Guinochet 1980: rel. 8 in Tab. 6, sub *Prasio-Oleetum tetraclinetosum*).

Diagnostic species – *Olea europaea* var. *sylvestris* (dom.), *Bupleurum fruticosum*, *Teucrium atratum*, *Asparagus altissimus*, *Ruscus hypophyllum*, *Rhamnus myrtifolia*, *Jasminum fruticans*.

Short description – Wood formation dominated by *Olea europaea* var. *sylvestris*, linked to coastal cliffs and carbonate outcrops, up to around 600-650 m a.s.l.. Various other species of the order *Pistacio-Rhamnetalia alaterni* are associated, as well as endemic elements (*Teucrium atratum* and *Asparagus altissimus*) and *taxa* that are rare in similar formations, such as *Bupleurum fruticosum*, *Ruscus hypophyllum*, *Rhamnus myrtifolia*, *Jasminum fruticans* (Géhu *et al*., 1992).

Bioclimate – Mediterranean pluviseasonal-oceanic (thermomediterranean dry-subhumid).

Substrates – Carbonate.

Vegetation series – Edapho-xerophilous, North-African (Algerian), thermomediterranean dry-subhumid, calcicolous series of *Euphorbia dendroides* and Oleaster (*Bupleuro fruticosi-Euphorbio dendroidis* sigmetum).

Synchorology – Algeria: Capo Carbon near Béjaïa (Géhu *et al*., 1992); northern slope of Djebel Hairech (Guinochet, 1980).

B) *ASPARAGO ALBI-RHAMNION OLEOIDIS* Rivas Goday ex Rivas-Martínez 1975

Short description – Preforest aspects, shrubland and thermophilous sclerophyllous evergreen woods of the southern regions of the Iberian Peninsula and of the Maghreb-Tangerian section of North-Africa, connected to the thermomediterranean belt with an ombrotype from upper semiarid to oceanic subhumid (Meddour *et al*., 2017).

Synonym – *Oleo-Ceratonion siliquae* (*sensu auct. maghrebianum*, not *Oleo-Ceratonion siliquae* Braun-Blanquet ex Guinochet & Drouineau 1944).

Diagnostic species – *Aristolochia baetica*, *Asparagus aphyllus*, *Rhamnus lycioides* subsp. *oleoides*, *Calicotome infesta* subsp. *intermedia* (diff. reg.).

Syntaxonomic note – As shown by Meddour *et al*. (2017), the name *Oleo-Ceratonion siliquae* Braun-Blanquet ex Guinochet & Drouineau 1944 has often been used by phytosociology authors from the Maghreb region to identify the sclerophyllous scrub of the semiarid to subhumid thermomediterranean belt. However, according to other authors (e.g. Rivas-Martínez *et al*., 2011; Biondi *et al*., 2014) this alliance should be limited to the central Mediterranean (Spanish-Catalan coasts, northwestern part of Spain including the Balearic Islands, the coasts of the Italian Peninsula to the amphiadriatic coasts, including Corsica, Sardinia, Sicily and several other small ones of the Sicilian Channel); in southern Spain and North-Africa, *Oleo-Ceratonion* is thus replaced by *Asparago albi-Rhamnion oleoidis* (Meddour *et al*., 2017).

4) *TAMO COMMUNIS-OLEETUM SYLVESTRIS* Benadid ex Pérez Latorre, Galàn de Mera, Deil & Cabezudo 1996

OLEETOSUM SYLVESTRIS Benadid ex Pérez Latorre, Galàn de Mera, Deil & Cabezudo 1996

Lectotypus (ass. and subass.) – Rel. 3, Tab. 2 in Benabid, 1984 (Trav. Inst. Sci. Sér. Bot. 34, p. 8), designated in Pérez Latorre *et al*. (1996, p. 225).

Phytosociological data – Tab. 1, col. 4.1 (from Benabid 1984: Tab. 2, rels. 12-30).

Diagnostic species – Ass. and subass. *typicum*: *Olea europaea* var. *sylvestris* (dom.), *Clematis cirrhosa*, *Rosa sempervirens*, *Dioscorea communis*, *Arum italicum*, *Vinca difformis*, *Allium triquetrum*, *Acanthus mollis*.

Short description – Climacic forest formation dominated by *Olea europaea* var. *sylvestris*, as tall as 12-15 m; *Pistacia lentiscus*, *Quercus coccifera* and *Phillyrea latifolia* are associated in the woody layer, with a rich presence of climbers such as *Smilax aspera*, *Clematis cirrhosa*, *Dioscorea communis*, *Aristolochia baetica* and *Rosa sempervirens*.

Bioclimate – Mediterranean pluviseasonal-oceanic (thermomediterranean subhumid-humid).

Substrate – Clay marls, on colluvial soils.

Vegetation series – Climatophilous, North-African (Moroccan), thermo- and mesomediterranean subhumid-humid, verticicolous series of Oleaster (*Tamo communis-Oleo sylvestris* sigmetum).

Synchorology – Morocco, Western Rif, from the Mediterranean coast to the Tangerian Peninsula (Rharb, Trifa, Sais, Doukkala, Tadla etc.) (Benabid, 1984; Pérez Latorre *et al*., 1996).

FRAXINETOSUM ANGUSTIFOLIAE Benadid ex Pérez Latorre, Galàn de Mera, Deil & Cabezudo 1996

Lectotypus – Rel. 3, Tab. 2 in Benabid, 1984 (Trav. Inst. Sci. Sér. Bot. 34, p. 8), designated in Pérez Latorre *et al*. (1996, p. 260).

Phytosociological data – Tab. 1, col. 4.2 (from Benabid 1984: Tab. 2, rels. 1-4).

Diagnostic species – Olea europaea var. *sylvestris* (dom.), *Fraxinus angustifolia*, *Hedera canariensis*.

Short description – Wood formation dominated by *Olea europaea* var. *sylvestris* tied to rich and humid soils, more than 10 m tall, differentiated by the presence of *Fraxinus angustifolia* and *Hedera canariensis* in the woody layer.

Substrate – Shales and marls.

Bioclimate – Mediterranean pluviseasonal-oceanic (thermo- and mesomediterranean dry-subhumid).

Vegetation series – Edapho-xerophilous, North-African (Moroccan), thermo- and mesomediterranean subhumid dry-subhumid, verticicolous series of Oleaster (*Tamo communis-Oleeto sylvestris fraxino angustifoliae* sigmetosum).

Synchorology – Morocco, Western Rif, from the Mediterranean coast to the Tangerian peninsula (Rharb, Trifa, Sais, Doukkala, Tadla etc.) (Benabid, 1984; Pérez Latorre *et al*., 1996).

C) *OLEO SYLVESTRIS-CERATONION SILIQUAE* Br.-Bl. 1936 ex Guinochet & Drouineau em. Rivas-Martínez 1975

Short description – Preforest aspects, scrub and thermophilous to sclerophyllous woods from the northwestern part of Spain (Rivas-Martínez *et al*., 2011), to the coastal shores of the Italian peninsula and the amphiadriatic coasts, including the Balearic Islands, Corsica, Sardinia and the Islands of the Sicilian channel (Biondi *et al*., 2014). These formations are tied to the infra-, thermo- and mesomediterranean bioclimatic belts with a semiarid to subhumid ombrotype.

Diagnostic species – Olea europaea var. s*ylvestris*, *Euphorbia dendroides*, *Chamaerops humilis*, *Ruta chalepensis*, *Teucrium flavum*, *Artemisia arborescens*, *Asparagus horridus*, *Arum pictum*, *Calicotome villosa*, *Pinus halepensis*.

5) *PRASIO MAJORIS-OLEETUM SYLVESTRIS* O. Bolòs de & Molinier 1969.

Lectotypus – In Bolòs & Molinier, 1969 (Vegetatio 17(1), p. 257-258).

Phytosociological data – Tab. 1, col. 5a (from Bolòs & Molinier 1969: rel. 1, p. 257) and 5b (from Bolòs *et al*., 1970: Tab. 2).

Diagnostic species – Olea europaea var. *sylvestris* (dom.), *Arisarum vulgare*, *Prasium majus*, *Clematis cirrhosa* var. *balearica*, *Rubia peregrina* var. *longifolia*, *Asparagus horridus*, *Cyclamen balearicum*, *Smilax aspera* var. *balearica*.

Short description – Wood formation dominated by *Olea europaea* var. *sylvestris*, 5-6 (10) m tall, typical of more or less xeric rocky coasts (online Appendix II, Fig. 1a). It is often associated with scrub and climber elements (*Pistacia lentiscus*, *Rhamnus alaternus*, *Lonicera implexa*, *Dioscorea communis*, *Rubia peregrina* var. l*ongifolia*, *Prasium majus*, *Arisarum vulgaris*, etc.) as well as some particular entities, including *Cyclamen balearicum*, *Clematis cirrhosa* var. *balearica*, *Asparagus stipularis* (online Appendix II, Fig. 1b) and *Smilax aspera* var. *balearica* (Bolòs & Molinier 1969; Bolòs *et al*., 1970; Rivas-Martínez *et al*., 1992; Bolòs, 1996).

Bioclimate – Mediterranean pluviseasonal-oceanic (thermomediterranean dry-subhumid).

Substrate – Mesozoic limestone and dolomite, calcarenite and Miocene calcilutite (Fornós & Gelabert, 2011).

Vegetation series – Edapho-xerophilous, Minorcan (Balearic Islands), thermomediterranean dry-subhumid, calcicolous series of Oleaster (*Prasio majoris-Oleo sylvestris* sigmetum).

Synchorology – Spain, in the Balearic Islands: Islands of Menorca and, more rarely, Mallorca (Rivas-Martínez *et al*., 1992).

6) *ASPARAGO ALBI-OLEETUM SYLVESTRIS* Bacchetta, Bagella, Biondi, Farris, Filigheddu & Mossa 2003

Holotypus – Rel. 29, Tab. 4, in Bacchetta *et al*. (2003, p. 52).

Phytosociological data – Tab. 1, col. 6 (from Bacchetta *et al*., 2003, Tab. 4).

Diagnostic species – Olea europaea var. *sylvestris* (dom.), *Asparagus albus*, *Euphorbia dendroides*, *Chamaerops humilis*.

Short description – Microwood formation dominated by *Olea europaea* var. *sylvestris*, 5-6 (8) m tall, tied to coastal slopes up to about 300 m a.s.l. (online Appendix II, Fig. 1d). It is often associated with elements of the Mediterranean maquis, including *Euphorbia dendroides*, *Asparagus albus* (online Appendix II, Fig. 1c), *Chamaerops humilis* – indicated as components of the characteristic composition –, *Pistacia lentiscus*, *Myr-*

tus communis, *Rhamnus alaternus*, *Phillyrea latifolia*, *Arisarum vulgare*, etc. (Bacchetta *et al*., 2003).

Bioclimate – Mediterranean pluviseasonal-oceanic (thermomediterranean dry-subhumid).

Substrate – Oligo-Miocene trachytes and andesites, basalts, Mesozoic and Miocene limestones, marls, sandstones, etc. (Bacchetta *et al*., 2009).

Vegetation series – Climatophilous, Italo-Tyrrhenian (Sardinian), mesomediterranean dry-subhumid, indifferent edaphic series of Oleaster (*Asparago albi-Oleo sylvestris* sigmetum; Bacchetta *et al*., 2009, 2010).

Synchorology – Italy, in Sardinia, coastal belt of the whole island area (Bacchetta *et al*., 2009).

7) *ASPARAGO ACUTIFOLII-OLEETUM SYLVESTRIS* Bacchetta, Bagella, Biondi, Farris, Filigheddu & Mossa 2003

LONICERETOSUM IMPLEXAE Bacchetta, Bagella, Biondi, Farris, Filigheddu & Mossa 2003

Holotypus (ass. and subass.) – Rel. 31, Tab. 3, in Bacchetta *et al*. (2003, p. 52).

Phytosociological data – Tab. 1, col. 7.1 (from Bacchetta *et al*., 2003: Tab. 3, rels. 31-32).

Diagnostic species – Olea europaea var. *sylvestris* (dom.), *Asparagus acutifolius*, *Rhamnus alaternus*, *Lonicera implexa*, *Prasium majus*.

Short description – Microwood formation dominated by *Olea europaea* var. *sylvestris*, 5-6 (8) m tall, tied to sunny slopes, with decapitated or eroded soils that have been intensively grazed, up to about 200 m a.s.l. Associated elements from the maquis include *Rhamnus alaternus*, *Asparagus acutifolius*, *Prasium majus* and *Lonicera implexa* – indicated components of the characteristic combination – as well as *Pistacia lentiscus*, *Osyris alba*, *Smilax aspera*, *Rubia peregrina*, *Rosa sempervirens*, etc.

Bioclimate – Mediterranean pluviseasonal-oceanic (mesomediterranean dry-subhumid).

Substrate – Oligo-Miocene limestones.

Vegetation series – Edapho-xerophilous, Italo-Tyrrhenian (Sardinian), mesomomediterranean dry-subhumid, calcicolous series of Oleaster (*Asparago acutifolii-Oleo sylvestris* sigmetum; Bacchetta *et al*., 2009).

Synchorology – Italy, in Sardinia: coastal belt of the central-northern part of the Island (Bacchetta *et al*., 2003, 2009, 2010).

ANAGYRIETOSUM PHOETIDAE Bacchetta, Bagella, Biondi, Farris, Filigheddu & Mossa 2003

Holotypus – Rel. 24, Tab. 3, in Bacchetta *et al*. (2003, p. 52).

Phytosociological data – Tab. 1, col. 7.2 (from Bacchetta *et al*., 2003: Tab. 3, rels. 21, 24 and 32)

Short description – Microwood formation dominated by *Olea europaea* var. *sylvestris* tied to sunny slopes, preferring stations richer in organic matter (Bacchetta *et al*., 2003). Differential species are *Anagyris phoetida*, generally present with high coverage and sociability values, as well as *Ruscus aculeatus* and *Arum pictum*.

Diagnostic species – Olea europaea var. *sylvestris* (dom.), *Asparagus acutifolius*, *Rhamnus alaternus*, *Prasium majus*, in addition to *Anagyris foetida*, *Ruscus aculeatus*, *Arum pictum*.

Bioclimate – Mediterranean pluviseasonal-oceanic (lower mesomediterranean with an ombrotype between upper dry and lower sub-humid).

Substrates – Oligo-Miocene limestones, with soils rich in organic substance.

Vegetation series – Edapho-xerophilous, Italo-Tyrrhenian (Sardinian), mesomediterranean dry-subhumid, calcicolous series of Oleaster (*Asparago acutifolii-Oleo sylvestris anagyrio phoetidae* sigmetosum).

Synchorology – Italy, in Sardinia: coastal belt of the central-northern part (Bacchetta *et al*., 2003, 2009, 2010).

8) *RUTO CHALEPENSIS-OLEETUM SYLVESTRIS* Gianguzzi & Bazan 2019

Holotypus – Rel. 3, Tab. S1, in Gianguzzi & Bazan (2019a).

Diagnostic species – Olea europaea var. *sylvestris* (dom.), *Euphorbia dendroides*, *Ruta chalepensis* and *Pistacia terebintus*.

Short description – High scrub formation, microwood or wood dominated by *Olea europaea* var. *sylvestris*, from 3-4 to 7-8 (10) m tall, typical of quite xeric, rupestral and semirupestral stations, from (15) 50-60 m and 400 (720) m a.s.l. (online Appendix II, Fig. 2a). It is frequently associated with E*uphorbia dendroides*, sclerophyllous shrubs (*Pistacia lentiscus*, *Pistacia terebintus*, *Rhamnus alaternus*, *Phillyrea latifolia*, etc.), climbers (*Asparagus acutifolius*, *Smilax aspera*, *Rubia peregrina*, *Clematis cirrhosa*, etc.) and understory species (*Ruta chalepensis*, *Prasium majus*, *Asparagus albus*, *Teucrium fruticans*, *T. flavum*, *Ampelodesmos mauritanicus*).

Synchorology – Italy, coastal belt of Sicily and its minor islands (Gianguzzi & Bazan 2019a).

OLEETOSUM SYLVESTRIS Gianguzzi & Bazan 2019

Holotypus – Rel. 3, Tab. S1, in Gianguzzi & Bazan (2019a).

Diagnostic species – See ass.

Phytosociological data – Tab. 1, col. 8.1 (from Gianguzzi & Bazan, 2019a: Tab. S1, rels. 1-12).

Substrate – Limestones, dolomites, marls, etc. (Gianguzzi *et al*., 2015a, 2015b).

Bioclimate – Mediterranean pluviseasonal-oceanic (thermomediterranean dry-subhumid, with penetrations into the infra-mesomediterranean).

Vegetation series – Climatophilous and edapho-

xerophilous, Italo-Tyrrhenian (Sicilian), infra-, thermo- and mesomediterranean dry-subhumid, calcicolous series of Oleaster (*Ruto chalepensis-Oleo sylvestris oleo sylvestris* sigmetosum).

Synchorology – Italy, in Sicily: Hyblaean Mountains, Peloritan Mountains, Nebrodi Mountains, Madonie Mountains and Sicani Mountains (Gianguzzi & Bazan, 2019a).

CERCIDETOSUM SILIQUASTRI Gianguzzi & Bazan 2019

Holotypus – Rel. 15, Tab. S1, in Gianguzzi & Bazan (2019a).

Phytosociological data – Tab. 1, col. 8.2 (from Gianguzzi & Bazan, 2019a: Tab. S1, rels. 14-16).

Diagnostic species – Olea europaea var. *sylvestris* (dom.), *Euphorbia dendroides*, *Ruta chalepensis* and *Pistacia terebinthus* subsp. *terebinthus*, as well as *Cercis siliquastrum* and *Pennisetum setaceum*.

Substrate – Consolidated breccias or xeric river pebbly riverbeds on limestone or calcareous-dolomite reliefs.

Bioclimate – Mediterranean pluviseasonal-oceanic (thermomediterranean subhumid; Gianguzzi *et al*., 1996, 2006, 2015a, 2015b; Gianguzzi & La Mantia, 2000).

Vegetation series – Edapho-xerophilous, Italo-Tyrrhenian (Sicilian), thermomediterranean dry, calcicolous-detritic series of Oleaster (*Ruto chalepensis-Oleo sylvestris cercido siliquastri* sigmetosum).

Synchorology – Italy, in northwestern Sicily: Mount Pellegrino (Palermo) and Mount Sparacio (Trapani) (Gianguzzi & Bazan, 2019a).

CELTIDETOSUM AUSTRALIS Gianguzzi & Bazan 2019

Holotypus – Rel. 3, Tab. S1, in Gianguzzi & Bazan (2019a).

Phytosociological data – Tab. 1, col. 8.3 (from Gianguzzi & Bazan, 2019a: Tab. S1, rels. 17-20).

Diagnostic species – Olea europaea var. *sylvestris* (dom.), *Euphorbia dendroides*, *Ruta chalepensis* and *Pistacia terebinthus* subsp. *terebinthus*, as well as *Celtis australis*.

Substrate – Basaltic vulcanite (Gianguzzi *et al*., 1996, 2015a, 2015b).

Bioclimate – Mediterranean pluviseasonal-oceanic (thermomediterranean subhumid).

Vegetation series – Edapho-xerophilous, Italo-Tyrrhenian (Sicilian), thermomediterranean dry, volcanic basalt series of Oleaster (*Ruto chalepensis-Oleo sylvestris celtido* sigmetosum).

Synchorology – Italy, in eastern Sicily (Gianguzzi & Bazan, 2019a): coastal area between Fontanarossa and Giarre (Catania).

EUPHORBIETOSUM BIVONAE Gianguzzi & Bazan 2019

Holotypus – Rel. 21, Tab. S2, in Gianguzzi & Bazan (2019a).

Phytosociological data – Tab. 1, col. 8.4 (from Gianguzzi & Bazan 2019a: Tab. S2, rels. 21-43).

Diagnostic species – Olea europaea var. *sylvestris* (dom.), *Euphorbia dendroides*, *Ruta chalepensis* and *Pistacia terebinthus* subsp. *terebinthus*, as well as *Euphorbia bivonae* and *Artemisia arborescens*.

Substrate – Limestone-dolomite lithosols.

Bioclimate – Mediterranean pluviseasonal-oceanic (thermomediterranean dry-subhumid; Gianguzzi *et al*., 2010, 2014, 2016; Raimondo *et al*., 2000).

Vegetation series – Climatophilous, Italo-Tyrrhenian (Sicilian), infra-, thermos and mesomediterranean dry-subhumid, calcicolous series of Oleaster (*Ruto chalepensis-Oleo sylvestris euphorbio bivonae* sigmetosum).

Synchorology – Italy, in northwestern Sicily (Gianguzzi & Bazan, 2019a): between Palermo and Trapani's coasts (between Mount S. Calogero in Termini Imerese and M. Erice, near Trapani), Sciacca and the southern part of the Sicani Mountains (Pizzo Telegrafo and the southern slope of M. Genuardo; Gianguzzi *et al*., 2010).

RHAMNETOSUM OLEOIDIS Gianguzzi & Bazan 2019

Holotypus – Rel. 46, Tab. S3, in Gianguzzi & Bazan (2019a).

Phytosociological data – Tab. 1 col. 8.5 (from Gianguzzi & Bazan 2019a, Tab. S3, rels. 44-54).

Diagnostic species – Olea europaea var. *sylvestris* (dom.), *Euphorbia dendroides*, *Ruta chalepensis and Pistacia terebintus* subsp. *terebinthus*, as well as *Rhamnus lycioides* subsp. *oleoides* (online Appendix II, Fig. 2b), *Lonicera implexa*, *Aristolochia naviculari*s and *Phagnalon saxatile* var. *viride*.

Substrate – Limestone-calcarenite lithosols.

Bioclimate – Mediterranean pluviseasonal-oceanic (infra- and thermomediterranean with an ombrotype that ranges from semiarid to dry).

Vegetation series – Climatophilous and edapho-xerophilous, Italo-Tyrrhenian (Aegadian Islands), inframediterranean dry, calcicolous series of Oleaster (*Ruto chalepensis-Oleo sylvestris rhamno oleoidis* sigmetosum).

Synchorology – Italy, in Sicily: Aegadian Islands: Levanzo (Capo Grosso), Favignana (Mount Santa Caterina) and Marettimo (Gianguzzi & Bazan, 2019a).

PERIPLOCETOSUM ANGUSTIFOLIAE Gianguzzi & Bazan 2019

Holotypus – Rel. 57, Tab. S3, in Gianguzzi & Bazan (2019a).

Diagnostic species – *Olea europaea* var. *sylvestris* (dom.), *Euphorbia dendroides*, *Ruta chalepensis* and *Pistacia terebintus* subsp. *terebinthus*, as well as *Periploca angustifolia* (online Appendix II, Fig. 2c), *Lycium intricatum*, *Juniperus turbinata*.

Phytosociological data – Tab. 1, col. 8.6 (from Gianguzzi & Bazan 2019a: Tab. S3, rels. 55-59).

Substrate – Vulcanic lithosols (Gianguzzi, 1999, 2017).

Bioclimate – Mediterranean pluviseasonal-oceanic (infra-thermomediterranean, with a semi-arid to dry ombrotype; Gianguzzi *et al*., 2015a, 2015b).

Vegetation series – Edapho-xerophilous, Italo-Tyrrhenian (islands of the Sicily Channel), infra- and thermomediterranean semiarid-dry, indifferent edaphic series of Oleaster (*Ruto chalepensis-Oleo sylvestris periploco angustifoliae* sigmetosum).

Synchorology – Italy, on the islands of the Sicily Channel: Linosa and Pantelleria Inslands (Gianguzzi & Bazan, 2019a).

9) *CHAMAEROPO HUMILIS-OLEETUM SYLVESTRIS* Gianguzzi & Bazan 2019

Holotypus – Rel. 83, Tab. S4, in Gianguzzi & Bazan (2019a).

Diagnostic species – Olea europaea var. *sylvestris* (dom.), *Chamaerops humilis*, *Rhamnus alaternus*, *Acanthus mollis*.

Short description – High scrub formation or xerothermophile woods of *Olea europaea* var. *sylvestris*, 3-4 to 7-8 (10) m tall, typical of sandy-calcarenite and fossil dune environments, up to 150-200 m a.s.l.. It is associated with woody sclerophyllous elements (*Chamaerops humilis*, *Pistacia lentiscus*, *Rhamnus alaternus*, *Teucrium fruticans*, etc.), climbers (*Smilax aspera*, *Clematis cirrhosa*, *Rubia peregrina*, *Asparagus acutifolius*) and understory species (*Asparagus albus*, *Ampelodesmos mauritanicus*, *Osyris alba*, *Arisarum vulgare*, *Allium subhirsutum*, *Hyparrhenia hirta*, etc.).

ACANTHETOSUM MOLLIDIS Gianguzzi & Bazan 2019

Holotypus – The same of the association.

Phytosociological data – Tab. 1, col. 9.1 (from Gianguzzi & Bazan, 2019a: Tab. S4, rels. 60-87).

Diagnostic species – Olea europaea var. *sylvestris* (dom.), *Chamaerops humilis*, *Rhamnus alaternus*, in addition to *Acanthus mollis*, which is generally frequent in the understory.

Substrate – Coastal calcarenite.

Bioclimate – Mediterranean pluviseasonal-oceanic (infra-thermomediterranean, with an ombrotype that varies between semiarid and subhumid; Gianguzzi *et al*., 2012a).

Vegetation series – Climatophilous and edapho-xerophilous, Italo-Tyrrhenian (Sicilian), infra- and thermomediterranean semiarid- subhumid, calcarenitic series of Oleaster (*Chamaeropo humilis-Oleo sylvestris* sigmetum).

Synchorology – Italy, Sicily: coastal belt of the southern and northwestern part (Gianguzzi & Bazan, 2019a).

EPHEDRETOSUM FRAGILIS Gianguzzi & Bazan 2019

Holotypus – Rel. 95, Tab. S5, in Gianguzzi & Bazan (2019a).

Phytosociological data – Tab. 1, col. 9.2 (from Gianguzzi & Bazan, 2019a: Tab. S5, rels. 88-103).

Diagnostic species – Olea europaea var. *sylvestris* (dom.), *Chamaerops humilis*, *Rhamnus alaternus*, in addition to *Ephedra fragilis*, in general present with elevated coverage values, making the formation even more dense and impenetrable.

Substrate – Sand, fossil dunes and calcarenite outcrops.

Bioclimate – Mediterranean pluviseasonal-oceanic (infra-thermomediterranean, with an ombrotype between semiarid and subhumid).

Vegetation series – Edapho-xerophilous (subhalopholous), Italo-Tyrrhenian (Sicilian), infra- and thermomediterranean semiarid-subhumid, sandy-calcarenitic series of Oleaster (*Chamaeropo humilis-Oleo sylvestris ephedro fragilis* sigmetosum).

Synchorology – Italy, in Sicily: coastal belt between the Jato Valley and Castellammare del Golfo, and near Acate (Gianguzzi & Bazan, 2019a).

10) *HIPPOCREPIDO EMEROIDIS-OLEETUM SYLVESTRIS* ass. nova

Holotypus – Rel. 2, Tab. 2.

Syntaxonomic note – Gehù & Biondi (1997) emphasize that the classical association *Oleo-Euphorbieum dendroidis*, as described by Trinajstic (1973, 1984a), should be interpreted as a macrophytocoenosis of "*Euphorbia dendroides* scrubs", widely distributed along the coasts of the Mediterranean. The same authors later proposed its subdivision into geosynvicariants ("races géographiques") and decribed the *Coronillo emeroidis-Euphorbietum dendroidis* [= *Oleo-Euphorbietum dendroidis* subass. *coronilletosum emeroidis* Trinajstic (1973) 1984] for the Balkan area, which was later also recognized also for the Apennine slope (Biondi *et al*., 2002; Bianco *et al*., 1984). Within the range of the latter association, the formations dominated by *Olea europaea* var. *sylvestris* – representing climacic and edaphic-climacic aspects as woods, microwoods and high maquis – should be referred to the new phytocoenosis here described.

Phytosociological data – Tab. 1, col.10 [Tab. 2: rels. 1-2 (rels. ined.); 3-8, from Trinajstic 1984a (Tab. 2, rels. 1-3 and 6-7)].

Diagnostic species – *Olea europaea* var. *sylvestris* (dom.), *Euphorbia dendroides*, *Hippocrepis emerus* subsp. *emeroides* (= *Coronilla emerus* subsp. *emeroides*, *Emerus major* subsp. *emeroides*), *Ephedra foeminea* (=*E. campilopoda*), *Punica granatum*.

Short description – Wood or xerophile scrub formation dominated by *Olea europaea* var. *sylvestris* (online Appendix II, Fig. 1e). It is tall 5-6 (8) m, and connected to coastal and subcoastal carbonate lithophile slopes. The coenosis is differentiated by the presence of *Euphorbia dendroides*, *Hippocrepis emerus* subsp. *emeroides* and eastern Mediterranean gravitating elements, such as *Ephedra foeminea* (online Appendix II, Fig. 1f), *Colutea arborescens*, *Punica granatum* and *Paliurus spina-christi* (Trinajstic, 1973, 1984a, 1984b).

Bioclimate – Mediterranean pluviseasonal-oceanic (mesomediterranean subhumid-humid).

Vegetation series – Edapho-xerophilous, anphiadriatic (Italo-Balkan), mesomediterranean subhumid-humid, calcicolous series of Oleaster (*Hippocrepido emeroidis-Oleo sylvestris* sigmetum).

Synchorology – Some phytosociological relevés dominated by *Olea europaea* var. *sylvestris* published by Trinajstic sub *Oleo-Euphorbietum* subass. *coronilletosum emeroidis* (1975: Tab. 1, rels. 1 and 3; 1984a: Tab. 2, rels. 1-3 and 6-7) have been ascribed to this coenosis. On the basis of phytosociological literature, this syntaxon denotes a wide distributive potential in different areas of the Balkan peninsula, e.g. the Dubrovnik region (Fascetti & Veri, 1984), Pelješac peninsula, minor islands near Korčula, Jabuka Island (Trinajstic 1984b), Velika Palagruža, Mala Palagruža (Pavletic, 1984), Mana, Kornati Archipelago (Gaži-Baskova, and Bedalov, 1983), Ciovo Island, coast from Montenegrino to Budva (Pulevic 1970; Trinajstic 1975), and in Italian peninsula, at Conero (Biondi *et al*., 2002) and Puglia (Bianco *et al*., 1984). Aspects of the associaton have also been detected by us in Albania, near Porto Palermo (rels. 1-2 in Tab. 2).

2. Ord. *QUERCETALIA CALLIPRINI* Zohary1955

Short description of the aspects here considered – Microwood, wood or scrub formation dominated by Olea europaea var. sylvestris of the infra-thermomediterranean bioclimate belt with an ombrotype between lower subhumid to semi-arid and subhumid-humid. On the syntaxonomic aspect, this formations are here considered only with reference to the *Ceratonio-Pistacion lentisci* alliance.

Diagnostic species – *Olea europaea* var. *sylvestris*, *Pistacia lentiscus*, *Clematis cirrhosa*, *Prasium majus*, *Quercus coccifera*, *Ceratonia siliqua*, *Rhamnus lycioides* subsp. *oleoides*, *Rhamnus lycioides* subsp. *graecus*, *Myrtus communis*, *Jasminum fruticans*, *Calicotome villosa*, *Arbutus unedo*, *Phlomis fruticosa*, *Arisarum simorrhinum*, *Pistacia palaestina*, *Rubia tenuifolia*, *Punica granatum*, *Genista acanthoclada*, *Arbutus andrachne*, *Daphne gnidioides*, *Euphorbia characias* subsp. *wulfenii*, *Quercus aucheri*, *Dorystaechas hastata*, *Micromeria nervosa*, *Rhamnus palaestina*, *Daphne sericea*, *Juniperus foetidissima*, *Phlomis bourgaei*, *Cyclamen persicum*, *Paliurus spina-christi*, *Ephedra major*, *Pinus brutia*.

D) *CERATONIO SILIQUAE-PISTACION LENTISCI* Zohary et Orshan 1959

Synonyms – *Ceratonio-Pistacion lentisci* Zohary1955; *Ceratonio-Pistacion creticum* Zohary & Orshan1966; *Ceratonio-Rhamnion oleoidis* Barbero & Quézel 1979; *Ceratonio siliquae-Rhamnion oleoidis* Barbero & Quézel ex Quézel *et al*. 1993.

Syntaxonomic note – Unlike Mucina *et al*. (2016) who put this alliance within the order *Pistacio-Rhamnetalia alaterni*, we consider to classify the *Ceratonio-Pistacion lentisci* within the order *Quercetalia calliprini* (according to Zohary & Orshan, 1959); in fact, as shown in the synoptic table (Tab. 1, col. 11a-15b), the coenoses includes a prominent group of East-Mediterranean species belonging to the order *Quercetalia calliprini*.

Short description – Termomediterranean sclerophyllous xerophilous evergreen woods and maquis dominated by *Olea europaea* var. *sylvestris* of the eastern Mediterranean.

Diagnostic species – See order.

11) *RUBIO TENUIFOLIAE-EUPHORBIETUM DENDROIDIS* Géhu, Costa & Uslu 1988

Holotypus – Rel. 4, Tab. 1, in Géhu *et al*. (1988, p. 609).

Phytosociological data – Tab. 1, col. 11a (from Géhu *et al*.,1988:Tab. 1, rel. 4) and col. 11b (from Biondi & Gehu, 1987: Tab. 1, rels. 1-3).

Syntaxonomic note – The association was described by Géhu *et al*. (1988) for the southern shores of Turkey; however, in the holotype indicated by the authors, the physiognomically dominant species is *Olea europaea* var. *sylvestris* (component of the tree layer) and not *Euphorbia dendroides* (a low open maquis species). Therefore, it would be a nomen ambiguum (ICPN, Art. 36 - Weber *et al*., 2000). The reléves of the original table might be divided into 2 syntaxa of the same rank: an *Oleetum*, as a forest vegetation series head; and an *Euphorbietum*, as a maquis secondary aspect (ICPN, art. 24 - Weber *et al*., 2000). However also, in this case, given the lack of data at a broader scale, in this case we prefer to maintain the name coined by Géhu *et al*. (1988) at the moment.

Diagnostic species – *Olea europaea* var. *sylvestris* (dom.), *Euphorbia dendroides*, *Rubia tenuifolia* subsp. *tenuifolia*, *Genista acanthoclada*, *Daphne gnidioides*,

Rhamnus oleoides.

Short description – Scrub, wood or microwood formation dominated by *Olea europaea* var. *sylvestris*, up to 6-7 m high, associated with rocky carbonatic substrates, widespread from maritime areas to inland hills, up to 400-600 m a.s.l., with a predominantly southern exposure. *Euphorbia dendroides* and various other species from *Pistacio-Rhamnetalia alaterni* are associated with it, together with Aegean elements or those tending towards the eastern Mediterranean, such as *Rubia tenuifolia* subsp. *tenuifolia*, *Genista acanthoclada*, *Pistacia palaestina*, *Daphne gnidioides*, *Rhamnus oleoides* subsp. *graecus* (Gehu *et al*., 1988).

Bioclimate – Mediterranean pluviseasonal-oceanic (thermomediterranean dry-subhumid).

Substrate – Limestone.

Vegetation series – Edapho-xerophilous, Aegean-Turkish, thermomediterranean dry-subhumid, calcicolous series of *Euphorbia dendroides* and Oleaster (*Rubio tenuifolii-Euphorbio dendroidis* sigmetum).

Distribution –The association has been described by Géhu *et al*. (1988) for the southwestern coasts of Turkey (Kas region), extending to the Aegean region and even further east to Antalya. In the Aegean area, the same authors – in reference to the studies of Davis (1965-88) and Carlstrom (1987) – identified another potential distribution area also in the eastern Sporades of the Dodecanese and the nearby islands southwestern of Turkey. Akman *et al*. (1978, 1979) identified similar aspects for various points of Taurus, in Anatolia.

12) *JUNIPERO FOETIDISSIMAE-OLEETUM SYLVESTRIS* ass. nova

Holotypus – In Arkman *et al*., 1978 (rel. 2, in Tab. p. 24).

Phytosociological data – Tab. 1, col. 12 (from Arkman *et al*., 1978: Tab. p. 24).

Diagnostic species – *Olea europaea* subsp. *sylvestris* (dom.), *Ceratonia siliqua*, *Juniperus foetidissima*, *Arbutus andrachne*, *Cupressus sempervirens*.

Short description – Xerophilous microwood formation dominated by *Olea europaea* var. *sylvestris*, 6-7 m high, tied to compact rocky carbonatic substrates with poor topsoil. Frequent species in the tree layer are *Ceratonia siliqua*, *Phillyrea media*, *Pistacia palestina*, as well as *Juniperus foetidissima*, a species whose distribution extends from southeastern Europe to Western Asia, and whose presence around the Köprülü Canyon is remarkable because it is located in the thermomediterranean (Akman *et al*., 1978).

Bioclimate – Mediterranean pluviseasonal-oceanic (thermomediterranean subhumid-humid).

Substrate – Compact limestone.

Vegetation series – Edapho-xerophilous, Turkish (North-Anatolian), thermomediterranean subhumid-humid, calcicolous series of Oleaster (*Ceratonio siculae-Oleo sylvestris* sigmetum).

Distribution – Mediterranean Turkey, in the Köprülü Canyon region (North of Antalya; Akman *et al*., 1978).

13) *QUERCO AUCHERI-OLEETUM SYLVESTRIS* Vural, Duman, Güner, Dönmez & Şağban 1995

Holotypus – Rel. 570, Tab. 5, in Vural *et al*. (1995, p. 451).

Phytosociological data – Tab. 1, col. 13 (from Vural *et al*., 1995: Tab. 5, rels. 555-573).

Diagnostic species – *Olea europaea* subsp. *sylvestris* (dom.), *Quercus aucheri*, *Phillyrea latifolia*, *Daphne gnidioides*, *Crepis zacintha*, *Picris altissima*, *Sedum rubens*, *Quercus coccifera*, *Phlomis lycia*, *Onosma frutescens*.

Short description – Microwood formation dominated by *Olea europaea* var. *sylvestris*, 4-5 (6) m high, typical of rocky outcrops and detritic slopes. In the tree layer are often associated *Quercus aucheri* – a species that is spread throughout the Aegean islands of Greece and parts of Anatolian Turkey (Quézel *et al*., 1978, 1980; Aykut *et al*., 2017) – and *Phillyrea latifolia*. Other characteristic and differential species include *Daphne gnidioides*, *Picris altissima*, *Crepis zacintha*, *Sedum rubens*, *Quercus coccifera*, *Phlomis lycia*, *Onosma frutescens* and *Euphorbia characias* subsp. *wulfenii*.

Bioclimate – Mediterranean pluviseasonal-oceanic (infra- and thermomediterranean with subhumid-humid ombrotype).

Substrate – Limestones and alluvial deposits.

Vegetation series – Climatophilous and edapho-xerophilous, Aegean-Turkish, infra- and thermomediterranean subhumid-humid, verticicolous series of Oleaster (*Querco aucheri-Oleo sylvestris* sigmetum).

Distribution – Mediterranean Turkey, in the province of Muğla (Köyceğiz-Dalyan Nature Reserve; Vural *et al*., 1995).

Syntaxonomic note – In the table of associations published by the authors (Tab. 5 in Vural *et al*., 1995), two distinct relevés blocks stand out. The typical aspect of the association – called subass. *daphnetosum gnidioides* – regards the relevés distinguished by a certain dominance of *Olea europaea* var. *sylvestris* (rels. 555-573); the relevés referring to subass. *pinetosum brutiae* (rels. 823-826) show a distinct dominance of *Quercus aucheri* – with coverage values equal to 4 or 5 –, with low values of *Olea europaea* var. *sylvestris*, in addition to differences in the floristic community. Given the objectives of this present study, here we only considered the relevés with a clear dominance of *Olea europaea* var. *sylvestris*.

14) *DORYSTAECHO HASTATAE-OLEETUM OLEASTRI* Kurt, Ketenoğlu, Akman, Özdeniz, Şekerciler, Bölükbaşı & Özbey 2015

Holotypus – Rel. 5, Tab. 1, in Kurt *et al*. (2015, p. 490).

Phytosociological data – Tab. 1, col. 14 (from Kurt *et al*., 2015: Tab. 1).

Diagnostic species – *Olea europaea* subsp. *sylvestris* (dom.), *Ceratonia siliqua*, *Dorystachys hastata*, *Quercus aucheri*, *Phagnalon rupestre* subsp. *graecum*, *Phlomis bourgaei*, *Rubia tenuifolia*, *Rhamnus lycioides* subsp. *graeca*.

Short description – Secondary maquis formation dominated by *Olea europaea* var. *sylvestris*, 2-3 m tall, established after the destruction of *Pinus brutia* pine groves (Barbero *et al*., 1980). It is typical of steep rocky slopes with little organic matter, between 100 and 700 m a.s.l., exposed to the south and southwest. Various species from *Pistacio-Rhamnetalia* and *Quercetea ilicis* are associated, as well as various eastern elements indicated among the characteristics of the alliance *Ceratonio-Rhamnion*, reported here as a diagnostic species.

Bioclimate – Mediterranean pluviseasonal-oceanic (thermomediterranean dry).

Substrate – Limestone.

Vegetation series – Edapho-xerophilous, Turkish (Antalya Subregion), infra- and thermomediterranean subhumid, calcicolous series of Turkish pine (*Phlomido bourgeai-Pineto brutia* sigmetum).

Distribution – Mediterranean Turkey, in the coastal zone of the Antalya Gulf, between Antalya and Finike (Kurt *et al*., 2015).

15) *SPIRAEO CRENATAE-OLEETUM SYLVESTRIS* Karaer, Kilinc, Korkmaz, Guray Kutbay, Yalcin & Bilgin, 2010

Holotypus – Rel. 39, Tab. 4, in Karaer *et al*. (2010, p. 42).

Phytosociological data – Tab. 1, col. 15a (from Karaer *et al*., 2010: Tab. 4) and 15b (from Korkmaz *et al*., 2011: Tab. 3).

Diagnostic species – *Olea europaea* var. *sylvestris* (dom.), *Spiraea crenata*, *Juniperus excelsa*, *Sedum pallidum*, *Linum corymbulosum*, *Micromeria nervosa*.

Short description – Maquis or scrub formation dominated by *Olea europaea* var. *sylvestris*, 3-4 m tall, typical of carbonatic rocky outcrops, on southern-exposed slopes, at 400-450 m a.s.l. In the woody layer, the following taxa are associated: P*hillyrea latifolia*, *Pistacia palaestina* (=*P. terebinthus* subsp. *palaestina*), *Juniperus excelsa*, *Buxus sempervirens*, *Jasminum fruticans*, *Ephedra major*, etc.. The herbaceous layer is sparse, and more frequently defined by the presence of *Chrysopogon gryllus*, *Iberis simpex* (= *I. taurica*) and *Sedum pallidum*.

Bioclimate – Mediterranean pluviseasonal-oceanic (thermomediterranean dry).

Substrate – Limestone.

Vegetation series – Edapho-xerophilous, northern Turkish, thermomediterranean dry, calcicolous series of Oleaster (*Querco aucheri-Oleo sylvestris* sigmetum).

Distribution – Turkey, in the central region of the Black Sea: Valle Kizilirmak around Kepez Gorge, Zeytintürbe, and Ardıçtepe districts (Karaer *et al*., 2010; Korkmaz, 2011).

3. Ord. *QUERCETALIA ILICIS* Br.-Bl. ex Molinier 1934, Ann. Mus. Hist. Nat. Marseille 27 – 189, em. Rivas-Martínez 1975.

Short description of the aspects here considered – Woods and microwoods dominated by *Olea europaea* var. *sylvestris* of the thermo- and mesomediterranean belt with a dry and subhumid ombrotype. They are part of the following alliances: 1) *Querco rotundifoliae-Oleion sylvestris* (calcicolous substrates of the Western Mediterranean Subregion); 2) *Fraxino-Quercion ilicis* (calcicolous substrates of the central Mediterranean Subregion); 3) *Erico-Quercion ilicis* (silicicolous substrates of the central Mediterranean area) (Rivas-Martínez *et al*., 2001, 2002; Bacchetta *et al*. 2004; Mucina *et al*., 2016).

Diagnostic species – *Phillyrea latifolia*, *Ruscus aculeatus*, *Rosa sempervirens*, *Bryonia cretica* subsp. *dioica*, *Fraxinus angustifolia*, *Hippocrepis emerus* subsp. *emeroides* (=*Emerus major* subsp. *emeroides*), *Quercus rotundifolia*, *Ruscus hypophyllum*, *Quercus ilex*, *Cyclamen hederifolium* subsp. *hederifolium*, *Anemone palmata*, *Hedera iberica*, *Retama sphaerocarpa*, *Fraxinus ornus*, *Viscum album*, *Viola alba* subsp. *dehnhardtii*, *Quercus virgiliana*, *Viburnum tinus*, *Asplenium onopteris*, *Carex distachya*, *Cyclamen repandum* subsp. r*epandum*, *Phillyrea angustifolia*, *Quercus suber*, *Erica arborea*, *Pulicaria odora*, *Pyrus spinosa*, *Asplenium obovatum* subsp. *obovatum*, *Selaginella denticulata*.

E) *QUERCO ROTUNDIFOLIAE-OLEION SYLVESTRIS* Barbéro, Quézel & Rivas-Martínez in Rivas-Martínez, Costa & Izco 1986

Short description – Thermomediterranean woods from the eastern Mediterranean region with *Quercus rotundifolia*, *Quercus suber*, *Olea europaea* var. s*ylvestris* and *Ceratonia siliqua*.

Diagnostic species – *Arum italicum*, *Crataegus monogyna. Arisarum vulgare* subsp. *clusii*, *Arisarum simorrhinum*, *Osyris lanceolata*, *Viburnum tinus*, *Phlomis purpurea*, *Arum italicum* subsp. *neglectum*, *Rhamnus lycioides* subsp. *laderoi*, *Pyrus bourgaeana*.

16) *VIBURNO TINI-OLEETUM SYLVESTRIS* Costa, Capelo & Lousa 1994

TYPICUM

Holotypus – Rel. 10, Tab. 1, in Costa *et al*. (1994, p. 500).

Phytosociological data – Tab. 1, col. 16a (from Costa *et al*., 1994: Tab.1, rels. 1-14).

Diagnostic species – Olea europaea var. *sylvestris* (dom.), *Arum italicum*, *Vinca difformis*, *Dioscorea communis*, *Viburnum tinus*, *Bryonia cretica* subsp. *dioica*, *Ruscus aculeatus*, *Ceratonia siliqua*, *Acanthus mollis*, *Rosa sempervirens*.

Short description – Meso-microforests in which the wild olive (*Olea europaea* var. *sylvestris*) is the dominant tree species, 5-15 m tall, associated with vertisols and with a well-developed organic layer, at an elevation around 150 m a.s.l. Various other species are associated in the tree layer (*Ceratonia siliqua*, *Viburnum tinus*, *Phillyrea latifolia*, *Myrtus communis*, *Rhamnus oleoides* subsp. *oleoides*, *R. alaternus and Phlomis purpurea*), as well as climbers (*Smilax aspera*, *Rubia peregrina* subsp. *longifolia*, *Dioscorea communis*, *Bryonia cretica* subsp. *dioica*, *Clematis flammula*, *Lonicera peryclimenum* subsp. *hispanica*, *Lonicera etrusca*, *Vinca difformis* and *Rosa sempervirens*).

Bioclimate – Mediterranean pluviseasonal-oceanic (thermomediterranean subhumid).

Substrate – Vertisols derived from limestone, basalt, and sandstone.

Vegetation series – Climatophilous, Portuguese ("Olissiponense, Sadense and Arribadense"), thermomediterranean subhumid, verticicolous series of Oleaster (*Viburno tini-Oleo sylvestris* sigmetum).

Distribution – Portugal in the districts of Olissiponense, Sadense and Arribadense (Costa *et al*., 1994; Neto *et al*., 2009).

FRAXINETOSUM ANGUSTIFOLIAE Costa, Capelo & Lousa 1994

Holotypus – Rel. 19, Tab. 1, in Costa *et al*. (1994, p. 500).

Phytosociological data – Tab. 1, col. 16b (from Costa *et al*., 1994: Tab.1, rels. 15-24).

Diagnostic species – Olea europaea var. *sylvestris* (dom.), *Fraxinus angustifolia*, *Hedera helix* subsp. *canariensis*, *Iris foetidissima*.

Substrate – Clays (deep, rich and fresh vertisols).

Bioclimate – Mediterranean pluviseasonal-oceanic (thermomediterranean subhumid).

Vegetation series – Edapho-mesophilous, Portuguese, thermomediterranean subhumid, verticicolous series of Oleaster (*Viburno tini-Oleo sylvestris fraxino angustifoliae* sigmetosum).

Distribution – Portugal, in the districts of Olissiponense, Sadense and Arribadense (Costa *et al*., 1994).

EPHEDRETOSUM FRAGILIS Neto, Arsenio & Costa 2009

Holotypus – Rel. in Neto *et al*. (2009, p. 46).

Phytosociological data – Tab. 1, col. 16c (from Neto *et al*., 2010: rel. p. 46).

Diagnostic species – Olea europaea var. *sylvestris* (dom.), *Ephedra fragilis*, *Osyris lanceolata*.

Substrate – Clays (vertisols).

Bioclimate – Mediterranean pluviseasonal-oceanic (thermomediterranean subhumid).

Vegetation series– Climatophilous, Portuguese (Vicentine coast), thermomediterranean subhumid, verticicolous series of Oleaster (*Viburno tini-Oleo sylvestris ephedro fragilis* sigmetosum).

Synchorology – Portugal, in the district of the Vicentine Coast.

17) *ARO NEGLECTI-OLEETUM SYLVESTRIS* Rivas-Martínez & Cantò in Rivas-Martínez *et al*. 2002 corr. Rivas-Martínez & Cantò in Rivas-Martínez *et al*. 2011.

Synonyms – Tamo communis-Oleetum sylvestris sensu Rivas-Martínez (1987) not T*amo communis-Oleetum sylvestris* Benadid 1985 [in Travaux Inst. Scientifique (Rabat), ser. Bot. 34 – 7, Tab. 2] and *Tamo communis-Oleetum sylvestris* Benadid ex Pérez Latorre, Galàn de Mera, Deil & Cabezudo 1996 (art. 5); *Aro italici-Oleetum sylvestris* Rivas-Martínez & Cantò in Rivas. *et al*., Itinera Geobot. 15 (1): 39, 2002 (art. 43).

Syntaxonomic note – The floristic separation of the association in question from *Tamo-Oleetum sylvestris* Benadid 1985 – a coenosis described for the Rif-Tangerian area, of which it is considered a geovicariant – was established by Rivas-Martínez & Cantò 2002 in Rivas-Martínez *et al*. (2002), based on a floristic diversification; it is determined by the presence in *Aro-Oleetum sylvestris* of various species (C*rataegus brevispina*, *Phlomis purpurea* subsp. *purpurea* and *Rhamnus oleoides* subsp. *oleoides*) and on the other hand, the absence of other elements (*Ampelodesmos mauritanica*, *Buxus balearica*, *Calicotome intermedia*, *Crataegus maura*, *Tetraclinis articulata*, etc.) that distinguishes it from the North-African association (Rivas-Martínez & Cantò, in Rivas-Martínez *et al*., 2002). Based on the correct identification of *Arum neglectum* (Towns.) Ridley – instead of *Arum italicum* Mill. – the name *Aro italici-Oleetum* was successively corrected in *Aro neglecti-Oleetum sylvestris* (Rivas-Martínez *et al*., 2011).

TYPICUM

Holotypus – Rel. in Rivas-Martínez *et al*. (2002, p. 39).

Phytosociological data – Tab. 1, col. 17.1a (from Rivas-Martínez *et al*., 2002: rel. p. 39) and 18.1b (from Galán De Mera 2000: Tab. 1, rel. n. 17 and 69).

Diagnostic species – Olea europaea var. *sylvestris* (dom.), *Arisarum simorrhinum* var. *subexertum*, *Aristolochia baetica*, *Dioscorea communis*, *Vinca difformis.*

Short description – According to Rivas-Martínez & Cantò (in Rivas-Martínez *et al*., 2002), the coenosis

makes up "meso-microforests in which the wild olive (*Olea europaea* var. *sylvestris*) is the dominant tree, with an undergrowth rich in evergreen (P*hillyrea latifolia*, *Pistacia lentiscus*, *Rhamnus oleoides*, *Phlomis purpurea*), or deciduous shrubs (*Crataegus brevispina*), as well as an important number of vines (*Aristolochia baetica*, *Clematis cirrhosa*, *Smilax aspera*, *Dioscorea communis*, *Vinca difformis*) and geophytes (*Arisarum vulgare* var. *subexertum*, *Arum italicum*)".

Bioclimate – Mediterranean pluviseasonal-oceanic (thermo- and mesomediterranean dry-humid).

Substrate – Clays (various kinds of vertisols).

Vegetation series – Climatophilous, Iberian (Betic and Gaditan-Algarvian), thermo-mesomediterranean dry to humid, verticicolous series of Oleaster (*Aro neglecti-Oleo sylvestris* sigmetum; Quinto-Canas *et al*., 2012).

Distribution – Iberian Peninsula, between the strait of Gibraltar and Algarve.

FRAXINETOSUM ANGUSTIFOLIAE Pérez Latorre, Galán de Mera, Deil & Cabezudo ex Gianguzzi & Bazan subass. nova *hoc loco*

Lectotypus (designated here) – Inv. n. 22, Tab. 1 in Galán De Mera *et al*. 2000 (Acta Bot. Malacitana 25, p. 120).

Syntaxonomical note – This syntaxon was proposed by Pérez Latorre *et al*. (1996) based on a lectotypification relative to North-Africa (Benadid 1984, sub *Tamo-Oleetum sylvestris*), but initially also indicated for Spain together with the same subassociation *fraxinetosum angustifoliae*. After the separation of *Aro-Oleetum sylvestris* (Rivas-Martínez & Cantò 2002 in Rivas-Martínez *et al*., 2002) – described for the Iberian Peninsula as a geovicariant coenosis of the former – its subassociation *fraxinetosum angustifoliae* is leptotypified here. It is recognized for the Aljibico sector (Pérez Latorre *et al*., 1996).

Phytosociological data – Tab. 1, col. 17.2 (from Galan De Mera *et al*., 2000: Tab. 1, rels. 18, 22, 23, 6, 64, 70, 74).

Diagnostic species – Olea europaea var. *sylvestris* (dom.), *Ruscus hypophyllum*, *Crataegus brevispina*, *Rhamnus oleoides* subsp. *oleoides*.

Substrate – Clays (humid vertisols).

Bioclimate – Mediterranean pluviseasonal-oceanic (thermo- and mesomediterranean dry-humid).

Vegetation series – Edapho-mesophilous, southern Iberian, thermo-mesomediterranean dry-subhumid, verticicolous series of Oleaster (*Aro neglecti-Oleo sylvestris fraxino angustifoliae* sigmetosum).

Distribution – Spain: Aljibico sector (Pérez Latorre *et al*., 1996).

18) *RHAMNO LADEROI-OLEETUM SYLVESTRIS* (Cantò, Ladero, Perez-Chiscano and Rivas-Martínez 2011) nom. nov. prop.

Synonyms – Asparago albi-Oleetum sylvestris Cantò, Ladero, Perez-Chiscano and Rivas-Martínez in Rivas-Martínez *et al*. 2011 [Itinera Geobotanica 18(2), p. 428, 2011, Tab. 75.3.15, rel. 1, not *Asparago albi-Oleetum sylvestris* Bacchetta, Bagella, Biondi, Farris, Filigheddu & Mossa 2003.

Syntaxonomic note – The name *Asparago albi-Oleetum sylvestris* defined by Cantò *et al*., in Rivas-Martínez *et al*. (2011) constitutes a later homonym of the association already described by Bacchetta *et al*. (2003) for Sardinia, and therefore is not compliant with article 31 of the ICPN (Weber *et al*., 2000). For the association in question, which is endemic to the central Iberian area, it is therefore here reproposed the new name *Rhamno laderoi-Oleastretum sylvestris* (Cantò, Ladero, Perez-Chiscano and Rivas-Martínez 2011) nom. nov.

Holotypus – Rel. 1, Tab. 75.3.15, in Rivas-Martínez *et al*. (2011, p. 428).

Phytosociological data – Tab. 1, col. 18 (from Rivas-Martínez *et al*., 2011: Tab. 75.3.15.).

Diagnostic species – Olea europaea var. *sylvestris* (dom.), *Asparagus albus*, *Rhamnus lycioides* subsp. *laderoi* (=*R. laderoi*), *Arisarum simorrhinum*, *Pyrus bourgaeana*, *Daphne gnidium*, *Pistacia terebinthus. Pistacia lentiscus*, *Asparagus acutifolius*.

Short description – Microwood or scrub formation dominated by *Olea europaea* var. *sylvestris*, which is associated with *Rhamnus lycioides* subsp. *laderoi* (Iberian endemic), *Pyrus bourgaeana* (distributed in the southern Iberian Peninsula and northern Morocco), *Pistacia terebinthus*, *Pistacia lentiscus*, *Daphne gnidium*, *Asparagus albus*, *Asparagus acutifolius* and *Arisarum simorrhinum* are among the most frequent herbaceous elements. The coenosis carries out a primary role on the more or less rocky, steep and xeric slopes, primarily exposed to the south, up to about 700 m a.s.l.. It can also carry out a secondary role, as a substituting stage in the *Quercus rotundifolia* woodland series (*Pyro bourgaeanae-Querceto rotundifoliae* sigmetum; Cantò 2004).

Bioclimate – Mediterranean pluviseasonal-oceanic (Mesomediterranean, Dry-subhumid).

Substrate – Metamorphites, granites, etc.

Vegetation series – Climatophilous, central Iberian (Luso-Extremaduran), mesomediterranean dry-subhumid, silicicolous series of Ballota (*Pyro bourgaeanae-Querco rotundifoliae* sigmetum). Edapho-xerophilous, central Iberian (Luso-Extremaduran) mesomediterranean dry-subhumid, silicicolous series of Oleaster (*Rhamno laderoi-Oleo sylvestris* sigmetum).

Distribution – Spain, in the Toledo and Madrid provinces (Cantò *et al*., 2011).

Tab. 1 - Synoptic table of the *Olea europaea* var. *sylvestris* plant communities of the Mediterranean region.

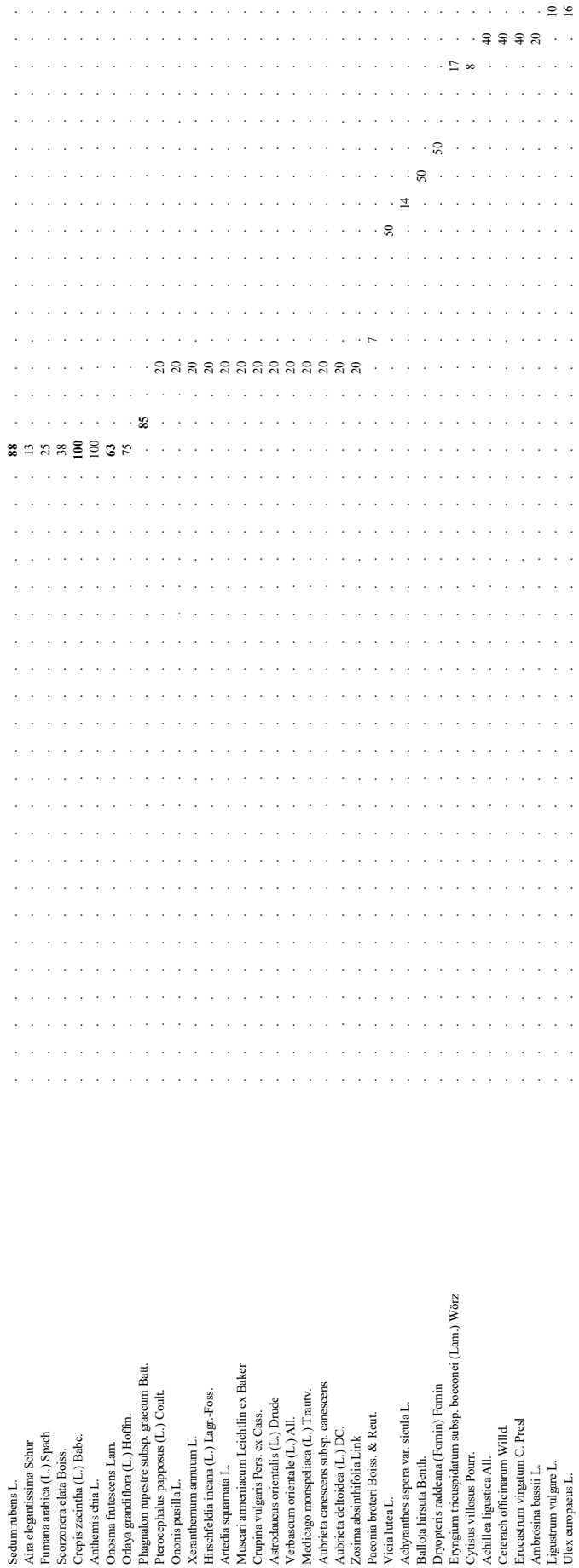
Column's number	1	2	3a	3b	4.1	4.2	5a	5b	6	7.1	7.2	7.1	7.2	8.3	8.4	8.5	8.6	9.1	9.2	10	11a	11b	12	13	15	15a	15b	16.1	16.2	16.3	17.1a	17.1b	17.2	18	19	20a	20b	21.1	21.2	22
Total number of relevés	7	8	2	1	19	4	1	5	4	2	3	12	4	4	23	11	5	28	16	8	2	3	2	8	13	10	10	14	10	1	1	2	7	10	8	8	6	12	5	31
Guide species																																								
Olea europaea L. var. *sylvestris* (Mill.) Lehr	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Characteristic all. *Tetraclinis articulatae-Pistacion atlanticae* Rivas-Martínez, Costa et Izco. 1986																																								
Tetraclinis articulata (Vahl) Mast.	**57**	**38**	.	.	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Searsia pentaphylla (Jacq.) F.A.Barkley	**57**	**38**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Asparagus altissimus Munby	.	**50**	**50**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pistacia atlantica Desf.	**86**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Astragalus chlorostachys Lindl.	**29**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Withania frutescens (L.) Pauquy	.	**100**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Teucrium atratum Pomel	.	.	**100**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Characteristic all. *Asparago albi-Rhamnion oleoidis* Rivas Goday & Rivas Martinez 1969																																							
Aristolochia baetica L.	.	25	.	.	100	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**100**	**100**	100	.	.	.	.	.	.	.
Calicotome infesta subsp. intermedia (C.Presl) Greuter	.	**88**	.	.	37	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Characteristic all. *Oleo sylvestris-Ceratonion siliquae* Br.-Bl. ex Guinochet & Drouineau 1944																																							
Euphorbia dendroides L.	.	.	100	.	.	.	.	20	**100**	.	.	**100**	**100**	**100**	**100**	**64**	**100**	7	31	**100**	100	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chamaerops humilis L.	.	.	100	.	74	50	.	.	**100**	.	.	8	.	.	61	.	.	**89**	**100**	.	.	.	.	.	.	.	.	.	.	.	100	.	29	.	.	.	.	17	.	.
Ruta chalepensis L.	.	.	.	.	.	.	.	.	.	.	.	**58**	**100**	.	**83**	**100**	**40**	11	.	.	.	.	.	.	31	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
Teucrium flavum L.	.	.	.	.	5	.	.	.	.	.	.	33	100	75	4	.	.	4	25	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Artemisia arborescens (Vaill.) L.	.	.	.	.	.	.	.	.	.	.	.	42	.	.	**52**	9	.	18	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	50	80	.
Asparagus horridus L.	14	63	.	.	.	.	**100**	**100**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Arum pictum L.f.	.	.	.	.	.	.	.	.	25	.	**67**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**63**	.	17	.	.	.
Cyclamen balearicum Willk.	.	.	.	.	.	.	**100**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Characteristic and diff. species of order *Pistacio lentisci-Rhamnetalia alaterni* Rivas-Martínez 1975																																							
Pistacia lentiscus L.	**100**	75	100	100	100	100	100	100	100	100	100	75	50	25	35	64	100	82	81	75	100	100	.	.	.	.	.	60	70	100	.	.	14	**30**	100	63	100	75	80	.
Clematis cirrhosa L. [incl. var. balearica (Rich.) Willk.(*)]	71*	.	50	.	**100**	100	**100***	**100***	.	.	.	58	100	100	48	45	60	32	6	.	.	.	100	88	23	.	.	.	.	.	100	100	83	.	100	63	.	58	.	.
Asparagus albus L.	71	50	50	100	26	25	.	80	**100**	.	.	42	75	100	91	.	.	61	69	.	.	.	.	.	.	.	.	93	50	.	100	100	43	**100**	.	.	.	50	.	.
Prasium majus L.	100	.	50	100	.	.	**100**	**60**	.	**50**	**33**	83	100	100	91	82	100	71	6	50	100	33	.	.	.	.	.	.	.	.	.	100	43	.	.	.	.	25	.	.
Rhamnus alaternus L. [incl. R. myrtifolia Willk.(*)]	.	13	**50***	.	16	.	.	20	25	**100**	**100**	75	75	100	43	.	40	**57**	6	.	.	.	.	.	.	.	.	87	90	100	.	.	71	.	.	38	.	25	**100**	.
Ceratonia siliqua L.	.	38	100	100	30	50	.	.	.	.	.	33	25	.	4	18	.	7	19	.	100	.	**100**	**25**	**92**	.	.	**60**	20	.	.	.	.	.	.	.	.	8	.	.
Quercus coccifera L.	.	25	.	.	26	50	.	.	.	.	.	.	.	.	.	.	.	.	13	13	100	67	100	100	69	.	.	33	60	.	.	.	.	10	.	.	.	.	.	.
Rhamnus lycioides subsp. oleoides (L.) Jahand. & Maire	.	**25**	.	.	11	.	.	.	.	.	.	.	.	.	4	**100**	.	21	.	13	**100**	**67**	.	.	.	.	.	60	40	.	**100**	.	14	.	.	.	.	.	.	55
Myrtus communis L.	.	.	50	.	.	25	.	20	75	.	.	.	.	.	.	.	40	4	.	.	.	.	50	.	46	.	.	40	10	.	.	.	.	10	.	**100**	**33**	.	.	.
Teucrium fruticans L.	.	.	100	.	.	25	.	.	.	.	.	50	.	.	22	55	.	50	88	.	.	.	.	.	.	.	.	7	10	.	.	50	29	.	.	.	.	42	.	.
Ampelodesmos mauritanicus (Poir.) T.Durand & Schinz	.	.	50	100	5	.	.	20	.	.	.	75	.	.	74	.	40	57	88	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	67	40	.
Osyris alba L.	.	.	.	.	.	.	.	.	.	.	67	25	.	.	22	.	.	32	6	.	.	.	.	.	.	.	.	20	60	.	.	.	.	10	.	.	.	17	.	39
Anagyris foetida L.	.	.	50	.	.	.	.	.	.	.	**100**	33	50	.	9	36	.	43	.	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25	.	.
Jasminum fruticans L.	43	.	**50**	**100**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	70	70	13	.	.	50	29	10	.	.	.	.	.	.	.
Pistacia terebinthus L.	.	.	.	.	.	.	.	.	.	.	.	**58**	**75**	**100**	**43**	.	.	4	.	2	.	.	.	.	.	.	.	.	.	.	.	.	14	**30**	.	.	.	.	.	.
Euphorbia characias L.	.	.	.	.	.	25	.	.	.	.	.	17	.	75	.	.	.	4	13	.	.	.	.	.	.	.	.	13	40	.	.	.	.	.	.	.	.	58	.	.
Ephedra fragilis Desf.	.	75	50	.	.	.	.	40	.	.	.	.	.	.	17	.	.	.	**100**	.	.	.	.	.	.	.	.	.	.	**100**	.	50	.	.	.	.	.	.	.	.
Arbutus unedo L.	14	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	20	20	27	10	.	.	.	.	.	.	.	.	.	.	.
Juniperus phoenicea var. turbinata (Guss.) Parl.	.	.	100	.	.	.	.	20	.	.	.	.	.	.	.	.	**40**	.	.	.	.	.	.	.	.	.	.	13	.	.	.	.	.	.	13	.	.	.	.	.
Asparagus aphyllus L.	.	.	.	.	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	67	80	100	.	50	29	.	.	.	.	.	.	.
Celtis australis L.	.	.	.	.	.	.	.	.	.	.	33	.	50	**100**	.	.	.	25	.	.	.	.	.	.	.	.	.	.	.	.	.	.	14	.	.	.	.	.	20	.
Calicotome villosa (Poir.) Link	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	50	.	.	75	62	.	.	.	.	.	.	.	14	.	.	.	17	.	.	.
Lycium intricatum Boiss.	.	**38**	.	.	.	.	.	.	.	.	.	.	.	.	4	.	**40**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ephedra foeminea Forssk.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**75**	.	100	.	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bupleurum fruticosum L.	.	.	**100**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10	.	.	.	.	.	.	.	.	.	.	.
Genista linifolia L.	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	29	.	.	.	.	.	.	.
Periploca laevigata subsp. angustifolia (Labill.) Markgraf	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	18	**100**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pinus halepensis Mill.	.	25	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ziziphus lotus (L.) Lam.	.	38	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cercis siliquastrum L.	.	.	.	.	.	.	.	.	.	.	.	.	**100**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Euphorbia bivonae Steud.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**96**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Aristolochia navicularis E.Nardi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**82**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phagnalon saxatile var. viride (R. Uechtr.) Font Quer	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**45**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phlomis fruticosa L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Punica granatum L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**13**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Characteristic all. *Ceratonio-Pistacion lentisci* Zohary et Orshan 1959 and ord. *Quercetalia calliprini* Zohary 1955																																								
Pistacia palaestina Boiss.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	100	13	38	60	60	.	.	.	.	.	.	.	.	.	.	.	.	.
Rhamnus lycioides subsp. graeca (Boiss. & Reut.) Tutin	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	50	13	**15**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rubia tenuifolia d'Urv.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**100**	.	.	38	**46**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Daphne gnidioides Jaub. & Spach	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**100**	.	.	**100**	46	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Euphorbia characias subsp. wulfenii (Hoppe ex W.D.J.Koch) Radcl.-Sm.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	100	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Quercus aucheri Jaub. & Spach	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	100	**46**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sedum pallidum M.Bieb.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**100**	**100**	.	.	.	.	.	.	.	.	.	.	.	.	.
Juniperus excelsa M.Bieb.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	90	90	.	.	.	.	.	.	.	.	.	.	.	.	.
Linum corymbulosum Rchb.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**90**	**90**	.	.	.	.	.	.	.	.	.	.	.	.	.
Micromeria nervosa (Desf.) Benth.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**90**	**90**	.	.	.	.	.	.	.	.	.	.	.	.	.
Spiraea crenata L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**70**	**70**	.	.	.	.	.	.	.	.	.	.	.	.	.
Ephedra major Host	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	50	50	.	.	.	.	.	.	.	.	.	.	.	.	.
Pinus brutia Ten.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	20	20	.	.	.	.	.	.	.	.	.	.	.	.	.
Paliurus spina-christi Mill.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10	10	.	.	.	.	.	.	.	.	.	.	.	.	.
Genista acanthoclada DC.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**100**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rhamnus palaestina Boiss.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	50	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Juniperus foetidissima Willd.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**100**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Arbutus andrachne L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**50**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phlomis bourgaei Boiss.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**92**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dorystaechas hastata Boiss. & Heldr. ex Benth.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**69**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cyclamen persicum Mill.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	36	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Characteristic all. *Querco rotundifoliae-Oleion sylvestris* Barbéro, Quézel & Rivas-Martínez in Rivas-Martínez Costa & Izco 1986																																								
Arum italicum Mill.	.	.	.	100	**74**	50	.	.	.	.	.	17	.	.	4	.	.	.	13	.	.	.	.	.	.	.	.	**93**	100	100	.	.	14	.	.	.	.	17	.	19
Crataegus monogyna Jacq. [incl. C. monogyna subsp. brevispina (Kunze) Franco (*)]	.	.	.	.	37	25	.	.	.	.	67	.	.	.	.	.	.	4	6	.	.	.	.	.	.	.	.	.	.	.	**100***	.	**14***	50	.	.	17	17*	.	10
Vinca difformis Pourr.	.	.	.	.	**32**	25	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**87**	100	.	**100**	**50**	14	.	.	.	.	.	.	.
Arisarum vulgare subsp. clusii (Schott) K.Richt.)	.	.	.	.	79	50	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	87	90	.	.	.	.	.	.	.	.	92	100	.
Arisarum simorrhinum Durieu [incl. Arisarum simorrhinum var. subexsertum (Webb & Berthel.) Talavera (*)]	.	**63**	.	.	.	25*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**100***	**50**	43	**90**	.	.	.	.	.	.
Osyris lanceolata Hochst. & Steud. [=O.quadripartita Salzm. ex Decne]	57	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**100**	.	50	53	.	.	.	.	.	.	.
Viburnum tinus L.	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**80**	80	.	.	.	.	.	.	.	.	.	.	.
Phlomis purpurea L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13	.	.	**100**	50	.	.	.	.	.	.	.	.
Arum italicum subsp. neglectum (F.Towns.) Prime	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**100**	.	.	.	.	.	.	.	.	.
Rhamnus lycioides subsp. laderoi Rivas Mart. & J.M. Pizarro	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**100**	.	.	.	.	.	.
Pyrus bourgaeana Decne	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**40**	.	.	.	.	.	.
Characteristic all. *Fraxino orni-Quercion ilicis* Biondi, Casavecchia & Gigante ex Biondi et al., 2013																																								
Asplenium onopteris L.	.	.	.	.	5	25	.	.	.	.	.	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	100	.	.	.	.	**63**	.	17	.	60	.
Carex distachya Desf.	.	.	.	.	.	.	.	20	.	.	.	25	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13	10	.	.	.	.	.	**75**	13	.	17	.	.
Cyclamen repandum Sm.	.	.	.	.	.	.	.	.	.	.	.	42	.	.	48	36	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**100**	.	.	17	.	.
Aristolochia tyrrhena E.Nardi & Arrigoni	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**63**	.	.	.	.	.
Characteristic and diff. (*) all. *Erico arboreae-Quercion iicis* Brullo, Di Martino & Marcenò 1977																																								
*Cistus salvifolius L.	57	.	.	.	5	25	.	.	.	.	.	.	.	.	.	.	.	4	19	.	.	.	.	.	21	.	.	.	.	.	.	.	.	.	25	.	.	**50**	**80**	3
Quercus suber L.	14	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	11	19	.	.	.	.	.	.	.	.	7	10	.	.	.	.	.	.	.	.	42	.	.
*Calicotome infesta (C.Presl) Guss. subsp. infesta	.	.	.	.	.	.	.	.	.	.	.	25	.	25	26	.	.	25	25	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**100**	**100**	.
Erica arborea L.	.	.	.	.	.	.	.	.	.	.	.	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7	.	.	.	.	.	.	.	50	17	**50**	**40**	.
Pulicaria odora (L.) Rchb.	57	.	.	.	26	25	.	20	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	17	**50**	.	.
Phillyrea angustifolia L.	.	.	.	.	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	53	50	100	.	.	.	.	.	**100**	**17**	.	.	.
Pyrus spinosa Forssk.	.	.	.	.	.	.	.	.	.	.	.	17	.	.	.	.	.	7	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	33	**42**	**80**	.
Asplenium obovatum Viv.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**100**	26
Selaginella kraussiana (Kunze) A. Braun	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**40**	.
Carlina hispanica subsp. globosa (Arcang.) Meusel & Kästner	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**80**	.
Characteristic all. *Arbuto unedonis-Laurion nobilis* Rivas-Martínez, Fernández-González & Loidi 1999																																								
Laurus nobilis L.	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25	.	.	.	7	.	.	.	.	29	.	.	.	.	.	.	32
Glandora diffusa (Lag.) D.C.Thomas	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**65**
Brachypodium pinnatum (L.) P.Beauv.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**97**
Genista hispanica subsp. occidentalis Rouy	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**48**
Characteristic and diff. species of associations of order *Quercetalia ilicis* Br.-Bl. ex Molinier 1934																																								
Phillyrea latifolia L.	**100**	25	50	100	47	50	.	60	24	.	.	33	100	50	61	73	60	11	50	.	50	.	100	**100**	69	100	100	53	50	100	.	.	.	.	88	38*	17	58	.	.
Ruscus aculeatus L.	.	.	.	.	.	.	.	40	.	.	**67**	33	.	.	13	.	.	.	.	.	.	.	.	.	.	40	40	**47**	90	100	100	.	.	10	.	13	50	50	20	84
Rosa sempervirens L.	.	.	.	.	**53**	75	.	.	.	.	67	33	.	.	4	.	.	18	.	13	.	.	.	.	.	.	.	**20**	60	.	.	.	.	.	.	.	.	**83**	**80**	23

Bryonia cretica subsp. dioica (Jacq.) Tutin	14	.	.	.	32	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**47**	80	.	100	.	14	40	.	.	.	.	.	.
Fraxinus angustifolia Vahl	.	.	.	.	5	**100**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**70**	.	.	.	**14**	.	.	.	.	.	.	.
Hippocrepis emerus subsp. emeroides (Boiss. & Spruner) Lassen Soldano & F.Conti	.	.	.	.	.	.	.	.	.	.	.	17	.	.	4	.	.	7	.	**75**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8	.	.
Quercus rotundifolia Lam.	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13	.	.	.	.	.	.	.	.	.	.	.	.
Ruscus hypophyllum L.	.	.	**100**	.	42	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**86**	.	.	.	.	.	.	.
Quercus ilex L.	.	.	.	.	.	.	.	.	.	.	67	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	50	.	50	.	.	10
Cyclamen hederifolium Aiton	.	.	.	.	.	.	.	.	.	.	.	25	.	.	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	33	.	.
Cistus creticus subsp. eriocephalus (Viv.) Greuter & Burdet	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	40	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8	.	.
Anemone palmata L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	20	20	.	.	.	.	.	.	.	.	.	.	.
Fraxinus ornus L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	17	8	.	.
Hedera iberica (McAll.) Ackerf. & J.Wen	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	100	.	.	.	.	.	.	.	.	.	.
Retama sphaerocarpa (L.) Boiss.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	100	.	.	.	.	.	.
Cytisus scoparius (L.) Link	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	100	.	.	.	.	.	.
Lavandula pedunculata subsp. sampaiana (Rozeira) Franco	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	90	.	.	.	.	.	.
Quercus virgiliana (Ten.) Ten.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	40	.
Characteristic and diff.(*) species of class *Quercetea ilicis*																																								
Smilax aspera L. [incl. var. balearica Willk. ex A.DC. (*), var. mauritanica (Poir.) Gren. & Godr. (+) and var. altissima Moris & De Not. (^)]	.	38+	.	.	89	100	**100***	**100***	.	50	67	67	100	100	52	18	.	71	19	63	50	.	.	25	.	.	.	87	100	100^	100^	.	29	.	25	50	.	92	100	97
Dioscorea communis (L.) Caddick & Wilkin	14	.	.	100	**84**	75	100	80	.	50	.	33	.	50	4	36	.	7	.	63	.	.	.	13	.	.	.	**80**	90	100	**100**	**50**	86	.	100	75	50	25	.	39
Asparagus acutifolius L.	.	25	100	.	.	.	100	60	.	**100**	**100**	92	75	100	83	100	100	96	75	56	100	100	50	38	.	.	.	.	.	.	.	.	.	**30**	38	38	50	83	100	.
Rubia peregrina L. [incl. R. peregrina subsp. longifolia (Poir.) O.Bolòs (*)]	.	38	.	.	21	75	**100***	**100***	.	100	67	67	75	.	65	91	100	75	31	63	.	.	.	.	.	.	.	93	100	100	.	.	57*	.	50	38	33	83	60	87
Arisarum vulgare O.Targ.Tozz. subsp. vulgare	.	.	50	.	.	.	**100**	**100**	100	50	33	92	100	.	78	100	100	86	75	63	.	67	50	100	.	.	.	.	.	.	.	.	.	.	100	25	17	92	100	.
Lonicera implexa Aiton	57	25	.	.	21	50	.	20	.	**100**	.	.	.	25	.	**73**	.	.	25	.	.	.	.	.	.	.	.	30	20	100	.	.	14	.	13	.	17	17	.	.
Allium subhirsutum L.	.	.	.	.	.	.	.	.	.	.	.	58	100	100	48	73	40	82	63	.	.	100	.	.	.	.	.	.	.	.	.	.	.	.	.	28	.	33	80	.
Daphne gnidium L.	.	.	.	.	26	25	.	.	.	.	.	8	.	.	.	18	20	29	19	.	.	.	.	.	.	.	.	53	60	.	.	.	.	**30**	.	.	17	42	.	.
Carex halleriana Asso	.	.	50	.	37	75	.	20	.	.	.	8	.	.	17	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	38	13	.	.	.	.
Hedera helix L.	.	.	.	.	.	**25**	.	.	.	.	33	17	.	.	4	.	.	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	14	.	.	.	.	17	.	55
Clematis vitalba L.	.	.	.	.	.	.	.	.	.	50	.	.	.	.	.	.	.	7	.	.	.	.	.	.	.	20	20	.	.	.	.	.	.	.	.	.	.	8	40	3
Clematis flammula L.	.	.	.	100	26	75	.	.	.	.	.	.	.	.	.	.	.	.	.	25	.	.	.	.	.	.	.	.	.	.	.	.	14	.	.	.	17	.	.	.
Iris foetidissima L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**30**	100	.	.	.	.	.	.	.	.	.	39
Lonicera etrusca Santi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13	30	.	.	.	.	.	.	.	.	.	.	.
Viscum album L.	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Viola alba subsp. dehnhardtii (Ten.) W. Becker	.	.	.	.	.	.	.	.	.	.	.	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hedera canariensis Willd.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**90**	.	.	.	.	.	.	.	.	.	.	.
Juniperus oxycedrus L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	50	.	.	.	.	.
Celtis tournefortii Lam.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	17	.	.
Other species																																								
Geranium purpureum Vill.	14	.	.	100	63	75	100	80	.	.	.	8	.	.	4	.	.	25	.	.	.	.	.	13	.	30	30	.	.	100	.	50	14	.	75	.	17	.	20	3
Drimia maritima (L.) Stearn	29	50	.	100	.	.	.	.	.	.	.	42	25	50	22	100	.	36	69	25	100	.	.	.	15	.	.	.	.	.	.	100	14	80	.	.	.	17	80	.
Piptatherum miliaceum (L.) Coss.	.	38	.	.	63	25	.	60	.	.	.	25	50	.	22	45	.	64	6	38	50	100	.	.	46	.	.	.	.	.	100	.	.	.	.	.	17	33	.	.
Rubus ulmifolius Schott	.	.	.	.	58	75	.	.	.	.	.	25	.	50	4	.	40	21	.	.	.	.	.	.	.	.	.	.	.	.	.	.	14	.	75	50	17	**75**	**80**	42
Asphodelus ramosus L.	29	25	.	.	.	.	.	20	.	.	67	33	50	75	30	82	.	46	38	.	.	.	.	.	.	.	.	.	.	.	.	.	.	80	63	.	.	17	.	.
Acanthus mollis L.	.	.	.	.	**11**	50	.	.	.	.	.	50	100	.	52	55	.	**100**	.	.	.	.	.	.	.	.	.	**53**	30	100	.	.	86	.	.	.	.	67	40	.
Brachypodium retusum (Pers.) P.Beauv.	.	.	.	.	.	.	.	.	.	50	.	8	.	.	57	27	.	11	19	63	.	.	.	.	.	.	.	.	.	.	100	.	.	.	.	50	.	50	.	.
Hyparrhenia hirta (L.) Stapf	.	.	.	.	.	.	.	.	.	.	.	83	50	.	70	.	.	50	75	13	.	.	.	38	.	.	.	.	.	.	.	50	.	40	.	.	.	25	20	.
Melica minuta L.	.	.	50	.	37	50	.	.	.	.	.	8	.	.	4	.	.	.	.	.	50	.	.	75	.	.	.	.	.	.	.	50	14	.	.	13	.	.	.	.
Smyrnium olusatrum L.	.	.	.	.	58	25	.	.	.	.	.	.	.	.	13	18	.	25	6	.	.	.	.	.	.	.	.	.	.	.	100	.	14	.	.	.	33	.	.	.
Cistus creticus L. subsp. creticus	57	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.	11	38	.	.	.	50	13	31	20	20	.	.	.	.	.	.	.	.	.	.	.	.	.
Oxalis pes-caprae L.	.	.	.	.	3	.	.	.	.	.	.	33	100	.	4	.	.	39	75	.	.	.	.	.	.	.	.	.	.	100	.	.	14	.	.	.	.	17	.	.
Bituminaria bituminosa (L.) E.H.Stirt.	.	.	.	.	.	.	.	.	.	.	.	25	50	.	22	36	.	18	38	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8	80	.
Dactylis glomerata subsp. hispanica (Roth) Nyman	29	38	.	.	17	.	.	.	.	.	.	25	.	.	17	45	.	.	.	.	.	.	.	.	.	.	20	.	.	.	.	.	.	.	.	.	.	.	80	.
Umbilicus horizontalis (Guss.) DC.	.	.	.	.	.	.	.	.	25	.	.	8	.	50	13	18	.	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25	.	.
Phagnalon saxatile (L.) Cass.	.	.	.	.	.	.	.	.	25	.	.	25	.	.	26	.	80	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	17	40	.
Cistus monspeliensis L.	.	.	.	.	5	25	.	.	50	.	.	.	.	.	.	.	.	.	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13	.	**8**	.	.
Umbilicus rupestris (Salisb.) Dandy	.	.	.	.	21	25	.	.	75	.	33	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	50	.	17	.	.	.
Ferula communis L.	.	.	.	.	.	.	.	.	.	.	.	17	50	25	26	73	.	25	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Carlina sicula Ten.	.	.	.	.	.	.	.	.	.	.	.	8	.	75	30	.	20	.	19	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	17	.	.
Clinopodium nepeta (L.) Kuntze	.	.	.	.	.	.	.	.	.	.	.	.	.	75	4	.	.	4	.	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	33	20	.
Urtica membranacea Poir.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	9	.	29	.	.	.	.	.	.	.	.	.	.	.	.	.	.	14	.	.	.	.	8	.	.
Micromeria graeca (L.) Rchb. subsp. graeca	.	.	.	.	.	.	.	.	.	.	.	17	.	.	9	.	20	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	80	.
Micromeria graeca subsp. fruticulosa (Bertol.) Guinea	.	.	.	.	.	.	.	.	.	.	.	17	.	.	4	.	.	4	19	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8	.	.
Spartium junceum L.	.	.	.	.	.	.	.	.	.	.	.	8	.	.	4	.	.	4	.	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25	.	.
Polypodium cambricum L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	18	40	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	63	.	.	.	80	.
Melica ciliata L.	.	.	.	.	.	.	.	.	25	.	.	.	.	50	.	.	.	.	.	.	.	.	.	.	.	20	20	.	.	.	.	.	.	.	.	.	.	8	.	.

Capparis spinosa L.	.	.	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	46	6	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ballota hispanica (L.) Benth.	.	63	.	.	.	.	.	.	.	.	.	8	.	50	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	80	.
Erica multiflora L.	.	.	50	.	.	.	.	.	.	.	.	17	.	.	.	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8	.	.
Allium triquetrum L.	.	.	.	.	**21**	50	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	63	13	.	.	.	.
Brachypodium sylvaticum (Huds.) P.Beauv.	.	.	.	.	11	40	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	30	30	.	.	.	.	.	.	.	.	.	.	.	.	.
Centranthus ruber (L.) DC.	.	.	.	.	16	50	.	.	.	.	.	.	25	25	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hyoseris radiata L.	.	.	.	.	79	75	.	.	.	.	.	.	.	.	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Mercurialis annua L.	.	.	.	.	21	.	.	.	.	.	.	.	.	.	.	36	.	29	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	40	.
Thymbra capitata (L.) Cav.	.	.	.	.	.	.	.	.	.	50	33	.	.	.	.	.	.	11	19	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Foeniculum vulgare Mill.	.	.	.	.	.	.	.	.	.	.	.	33	.	.	26	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	17	.	.
Pallenis spinosa (L.) Cass.	.	.	.	.	.	.	.	.	.	.	.	8	.	.	4	9	.	.	.	25	.	.	.	.	.	.	.	.	.	.	.	50	.	.	.	.	.	.	.	.
Opuntia ficus-indica (L.) Mill.	.	.	.	.	.	.	.	.	.	.	.	.	25	50	.	.	20	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Reichardia picroides (L.) Roth	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9	9	20	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ficus carica L.	.	.	.	.	.	.	.	.	.	.	67	.	.	.	.	.	.	21	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25	.	.	.	.
Parietaria judaica L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	18	.	.	.	.	.	.	.	.	.	.	.	.	.	.	14	.	.	.	.	.	20	.
Clinopodium menthifolium subsp. ascendens (Jord.) Govaerts	.	.	100	.	16	50	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Thapsia garganica L.	.	.	.	.	70	.	.	.	.	.	.	.	25	25	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Arundo plinii Turra	.	.	.	.	.	.	.	.	.	.	.	8	.	.	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	33	.	.
Sedum sediforme (Jacq.) Pau	.	.	.	.	.	.	.	.	.	.	.	17	.	.	4	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vicia villosa Roth	.	.	.	.	.	.	.	.	.	.	.	8	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8	.	.
Piptatherum coerulescens (Desf.) P.Beauv.	.	50	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	63	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ulmus minor Mill.	.	.	.	.	.	.	.	.	.	.	.	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25	.	.
Biarum tenuifolium (L.) Schott	.	.	.	.	.	.	.	.	.	.	.	.	50	.	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	20	.
Magydaris pastinacea (Lam.) Paol.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	55	.	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8	.	.
Rhus coriaria L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8	.	.
Theligonum cynocrambe L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	100	.	.	.	.	.	.	.	.	.	.	.	13	.	17	.	.	.
Crucianella latifolia L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	100	.	.	.	100	100	.	.	.	.	.	.	.	.	.	.	.	.	.
Parietaria lusitanica L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13	.	70	70	.	.	.	.	.	.	.	.	.	.	.	.	.
Coronilla valentina subsp. glauca (L.) Batt.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	47	20	100	.	.	.	.	.	.	.	.	.	.
Ephedra altissima Desf.	29	25	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Polypodium vulgare L.	.	.	100	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Coronilla valentina L. subsp. valentina	.	.	100	.	.	.	.	.	.	.	.	17	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Torilis arvensis subsp. elongata (Hoffmanns. & Link) Cannon	.	.	.	.	32	25	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Eryngium tricuspidatum L.	.	.	.	.	21	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	100	.	.	.	.	.	.	.	.	.
Prunus spinosa L. [incl. subsp. insititioides (Ficalho & Cout.) Franco (*)]	.	.	.	.	.	.	.	.	.	.	33	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13*
Euphorbia ceratocarpa Ten.	.	.	.	.	.	.	.	.	.	.	.	8	.	50	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lomelosia cretica (L.) Greuter & Burdet	.	.	.	.	.	.	.	.	.	.	.	8	.	.	22	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lobularia maritima (L.) Desv.	.	.	.	.	.	.	.	.	.	.	.	8	.	.	.	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Carduus pycnocephalus L.	.	.	.	.	.	.	.	.	.	.	.	8	.	.	.	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ferulago nodosa (L.) Boiss.	.	.	.	.	.	.	.	.	.	.	.	8	.	.	.	.	.	.	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Torilis nodosa (L.) Gaertn.	.	.	.	.	.	.	.	.	.	.	.	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	20	.
Pennisetum setaceum (Forssk.) Chiov.	.	.	.	.	.	.	.	.	.	.	.	.	**100**	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Asplenium trichomanes L.	.	.	.	.	.	.	.	.	.	.	.	.	.	50	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	60	.
Mandragora officinalis Mill.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	18	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lathyrus oleraceus subsp. biflorus (Raf.) H.Schaef., Coulot & Rabaute	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	.	.	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Opopanax chironium (L.) W. D. J. Koch	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Acacia karroo Hayne	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Andropogon distachyos L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Urospermum dalechampii (L.) Scop. ex F.W.Schmidt	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cynoglossum creticum Mill.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8	.	.
Sedum cepaea L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	60	.
Coleostephus myconis (L.) Cass. ex Rchb.f.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	20	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	20	.
Galactites tomentosa Moench	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	18	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	20	.
Daucus carota L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	40	.
Pimpinella peregrina L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	40	.
Micromeria myrtifolia Boiss. & Hohen.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	88	38	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Teucrium divaricatum Sieber ex Heldr.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	75	31	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Buxus sempervirens L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	90	90	.	.	.	.	.	.	.	.	.	.	.	.	.
Chrysopogon gryllus (L.) Trin.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	90	90	.	.	.	.	.	.	.	.	.	.	.	.	.
Fumana thymifolia (L.) Spach	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	20	20	.	.	.	.	.	.	.	.	.	.	.	.	.
Iberis simplex DC.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	90	90	.	.	.	.	.	.	.	.	.	.	.	.	.
Ferula tingitana L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	100	29	.	.	.	.	.	.	.
Carthamus arborescens L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	50	14	.	.	.	.	.	.	.
Elaeoselinum foetidum (L.) Boiss.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	50	14	.	.	.	.	.	.	.
Anogramma leptophylla (L.) Link	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	50	.	.	.	.	.	.	40	.

Asplenium billotii F.W. Schultz	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	14	.	75	.	.	.	.	.
Lonicera periclymenum subsp. hispanica (Boiss. & Reut.) Nyman	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	14	.	.	.	.	.	.	10
Anarrhinum pedatum Desf.	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cytisus arboreus (Desf.) DC.	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lavandula pedunculata (Mill.) Cav.	71	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Asphodelus tenuifolius Cav.	.	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Fagonia cretica L.	.	63	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lavandula dentata L.	.	63	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Campanula dichotoma L.	.	.	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Helichrysum stoechas (L.) Moench	.	.	50	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Aristolochia fontanesii Boiss. & Reut.	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bellis sylvestris Cirillo	.	.	.	.	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Briza maxima L.	.	.	.	.	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Galium spurium L.	.	.	.	.	26	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Buxus balearica Lam.	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Luzula forsteri (Sm.) DC.	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Malope malacoides L.	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Parietaria mauritanica Durieu	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vicia tetrasperma (L.) Schreb.	.	.	.	.	26	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Solanum nigrum L.	.	.	.	.	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Stellaria media (L.) Vill.	.	.	.	.	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vicia leucantha Biv.	.	.	.	.	.	25	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pteridium aquilinum (L.) Kuhn	.	.	.	.	.	25	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Galium scabrum L.	.	.	.	.	.	25	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Geranium molle L.	.	.	.	.	.	25	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Euphorbia pterococca Brot.	.	.	.	.	.	.	.	40	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Aetheorhiza bulbosa (L.) Cass.	.	.	.	.	.	.	.	40	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Teucrium massiliense L.	.	.	.	.	.	.	.	.	25	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Stachys glutinosa L.	.	.	.	.	.	.	.	.	25	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Genista corsica (Loisel.) DC.	.	.	.	.	.	.	.	.	25	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Stipa bromoides (L.) Dörfl.	.	.	.	.	.	.	.	.	.	50	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dorycnium pentaphyllum Scop.	.	.	.	.	.	.	.	.	.	50	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Thymelaea hirsuta (L.) Endl.	.	.	.	.	.	.	.	.	.	.	33	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Asphodeline lutea (L.) Rchb.	.	.	.	.	.	.	.	.	.	.	.	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Brassica incana Ten.	.	.	.	.	.	.	.	.	.	.	.	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Foeniculum vulgare Mill. subsp. piperitum (Ucria) Bég.	.	.	.	.	.	.	.	.	.	.	.	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Galium lucidum All.	.	.	.	.	.	.	.	.	.	.	.	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rosmarinus officinalis L.	.	.	.	.	.	.	.	.	.	.	.	17	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Carlina corymbosa L.	.	.	.	.	.	.	.	.	.	.	.	.	.	75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lactuca viminea (L.) J.Presl & C.Presl	.	.	.	.	.	.	.	.	.	.	.	.	.	50	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Brassica villosa subsp. bivonana (Mazzola & Raimondo) Raimondo & Mazzola	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Centaurea panormitana Lojac.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	26	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Narcissus tazetta L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Leontodon tuberosus L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	18	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sonchus tenerrimus L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	18	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vicia benghalensis L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	40	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lathyrus clymenum L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Scrophularia peregrina L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Silene latifolia Poir.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Kundmannia sicula (L.) DC.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Helianthemum lippii (L.) Dum.Cours.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Plumbago europaea L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Prunus webbii (Spach) Vierh.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Scolymus hispanicus L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Parietaria officinalis L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ruta graveolens L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phlomis leucophracta P.H.Davis & Hub.-Mor.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	50	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Teucrium chamaedrys L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Brachypodium distachyon (L.) P.Beauv.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cupressus sempervirens L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**50**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Galium aparine L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Geranium robertianum L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	50	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Origanum onites L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phlomis lycia D.Don	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**63**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Picris altissima Delile	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**100**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.



F) *FRAXINO ORNI-QUERCION ILICIS* Biondi, Casavecchia & Gigante ex Biondi, Casavecchia & Gigante in Biondi, Allegrezza, Casavecchia, Galdenzi, Gigante & Pesaresi 2013

[*Fraxino orni-Quercion ilicis* Biondi, Casavecchia & Gigante 2003 nom. inval. (art. 5)].

Short description – Thermomediterranean woods of the central Mediterranean region with *Quercus ilex*, *Quercus suber*, *Olea europaea* var. *sylvestris* and sometimes deciduous plants.

Diagnostic species – *Fraxinus ornus* subsp. *ornus*, *Hippocrepis emerus* subsp. *emeroides*, *Ostrya carpinifolia*, *Dioscorea communis*, *Ruscus aculeatus*, *Cyclamen hederifolium*, *Cyclamen repandum*, *Festuca exaltata*, *Calicotome infesta*, *Carpinus orientalis*, *Cercis siliquastrum*, *Cistus creticus* subsp. *creticus*.

19) *CYCLAMINO REPANDI-OLEETUM SYLVESTRIS* Bacchetta, Bagella, Biondi, Farris, Filigheddu & Mossa 2003

Holotypus – Rel. 1, Tab. 1, in Bacchetta *et al*. (2003, p. 51).

Phytosociological data – Tab. 1, col. 19 (from Bacchetta *et al*., 2003: Tab. 1).

Diagnostic species – *Olea europaea* var. *sylvestris* (dom.), *Cyclamen repandum*, *Aristolochia tyrrhena*, *Carex distachya*, *Arum pictum*, *Asplenium onopteris*.

Short description – Microwood formation dominated by *Olea europaea* var. *sylvestris*, spread across steep xeric slopes, up to about 380-400 m a.s.l.; in the woody layer the following species are often associated *Pistacia lentiscus*, *Phillyrea latifolia*, *Juniperus oxycedrus* and *Clematis cirrhosa*. The herbaceous layer is differentiated by the presence of *Cyclamen repandum*, *Aristolochia tyrrhena*, *Carex distachya*, *Arum pictum* and *Asplenium onopteris*.

Bioclimate – Mediterranean pluviseasonal-oceanic (thermo-mesomediterranean with a dry-subhumid ombrotype).

Substrate – Intrusive vulcanites (granites, granodiorites and porphyrites) and metamorphites.

Vegetation series – Edapho-xerophilous, Italo-Tyrrhenian (Sardinian), thermo-mesomediterranean dry-subhumid, silicicolous series of Oleaster (*Cyclamino repandi-Oleo sylvestris* sigmetum).

Distribution – Italy, in Sardinia: eastern Sulcis and southern Sulcis, northern Sarrabus, southern Gerrei, Iglesiente and Fluminense (Bacchetta *et al*., 2003).

G) *ERICO ARBOREAE-QUERCION ILICIS* Brullo, Di Martino & Marcenò 1977

Short description – Wood formation of the central Mediterranean area dominated by evergreen (*Quercus ilex* and *Q. suber*) and sometimes deciduous tree species, tied to siliceous or strongly leached soils, distinguished by a community of calcifugous species.

Tab. 2 - *Hippocrepido emeroidis-Oleetum sylvestris* ass. nova [rels. 1-2 (unpublished): Albania, near Porto Palermo (8-7-2010); rels. 3-7 (from Trinajstic 1984a, Tab. 2 pro parte): Croatia at Jabuka and Obljak (rels.1-3 of Tab. 2) and at Pelješac (rels. 6-7 of Tab. 2)].

Relevé (n°)	1	2	3	4	5	6	7	
Altitude (m)	40	60	-	-	-	-	-	
Slope (°)	30	20	-	-	-	-	-	
Aspect	SW	S	-	-	-	-	-	
Area (m^2)	100	100	-	-	-	-	-	Presences
Total cover (%)	100	100	100	100	100	100	100	
Average height of the dominant layer (m)	4	4.5	-	-	-	-	-	
Species per relevé	19	22	5	11	12	7	7	7
Char. and diff. of association								
Olea europaea L. var. sylvestris (Mill.) Lehr	4	4	4	4	4	4	3	7
Euphorbia dendroides L.	2	2	2	1	2	1	2	7
Hippocrepis emerus (L.) Lassen subsp. emeroides (Boiss. & Spruner) Lassen, Soldano & F.Conti	.	+	.	+	1	+	2	5
Ephedra foeminea Forssk.	2	1	.	2	+	2	.	5
Punica granatum L.	.	1	.	.	.	.	.	1
Char. of the upper units								
Pistacia terebinthus L.	2	1	.	+	1	+	+	6
Smilax aspera L.	.	1	.	2	1	.	3	4
Dioscorea communis (L.) Caddick & Wilkin	1	2	.	2	2	.	.	4
Asparagus acutiofolius L.	1	1	+	.	1	.	.	4
Arisarum vulgare O.Targ.Tozz.	+	+	+	+	.	.	.	4
Rubia peregrina L.	.	+	.	1	2	.	+	4
Prasium majus L.	.	.	+	2	+	.	.	3
Phlomis fruticosa L.	1	2	.	.	.	.	.	2
Prunus webbii (Spach) Vierh.	1	1	.	.	.	.	.	2
Clematis flammula L.	1	+	.	.	.	.	.	2
Anagyris foetida L.	1	.	.	.	.	.	.	1
Pistacia lentiscus L.	1	.	.	.	.	.	.	1
Rosa sempervirens L.	.	1	.	.	.	.	.	1
Quercus coccifera L.	.	+	.	.	.	.	.	1
Other species								
Brachypodium retusum (Pers.) P.Beauv.	2	1	.	2	+	.	2	5
Piptatherum miliaceum (L.) Coss.	1	.	.	.	+	+	.	3
Pallenis spinosa (L.) Cass.	+	1	.	.	.	.	.	2
Drimia maritima (L.) Stearn	+	1	.	.	.	.	.	2
Clinopodium nepeta (L.) Kuntze	1	.	.	.	.	.	.	1
Plumbago europaea L.	1	.	.	.	.	.	.	1
Capparis spinosa L.	1	.	.	.	.	.	.	1
Spartium junceum L.	.	1	.	.	.	.	.	1
Parietaria officinalis L.	+	.	.	.	.	.	.	1
Hyparrhenia hirta (L.) Stapf	.	+	.	.	.	.	.	1
Scolymus hispanicus L.	.	+	.	.	.	.	.	1
Ruta graveolens L.	.	.	.	.	.	+	.	1

Diagnostic species – *Erica arborea*, *Teline monspessulana*, *Pulicaria odora*, *Cytisus villosus*, *Melica arrecta*, *Teucrium siculum*, *Poa sylvicola*, *Clinopodium vulgare* subsp. *arundanum*.

20) *MYRTO COMMUNIS-OLEETUM SYLVESTRIS* Bacchetta, Bagella, Biondi, Farris, Filigheddu & Mossa 2003

Synonym – *Pistacio lentisci-Oleetum sylvestris* Paradis, Feral, Passigny-Hernandez, Nicolau & Carles 2014 (Tab. 12).

Holotypus – Rel. 19, Tab. 2, in Bacchetta *et al.* (2003, p. 51)

Phytosociological data – Tab. 1, col. 20a (from Bacchetta *et al*. 2003, Tab. 2) and 20b (from Paradis *et al*., 2014, Tab. 12).

Diagnostic species – *Olea europaea* var. *sylvestris* (dom.), *Myrtus communis* and *Phillyrea angustifolia*.

Short description – Woodland formation dominated by *Olea europaea* var. *sylvestris*, 5-6 (8) m tall, spread along the coastal belt on granite slopes, as well as along gullies and xeric ditches. *Olea europaea* var. *sylvestris* can also be a recovered element from former olive groves where it was the rootstock; when these orchards have been abandoned for a long time and burned, vigorous suckers of the Oleaster re-emerged. In the woody

layer, characteristic elements include *Myrtus communis*, *Phillyrea angustifolia* and other acidophilous species from the *Erico arboreae-Quercion ilicis* alliance.

Bioclimate – Mediterranean pluviseasonal-oceanic (thermo-mesomediterranean with a dry-subhumid ombrotype).

Substrate – Granite.

Vegetation series – Edaphic-mesophilous, Italo-Tyrrhenian (Sardinian-Corsican), thermo-mesomediterranean dry-subhumid, silicicolous series of Oleaster (Myrto communis-Oleo sylvestris sigmetum).

Distribution – Italy, in northern Sardinia (Caprera and La Maddalena Island; Bacchetta *et al*., 2003) and Corsica (Gulf of Valinco, Olmeto, Baracci and Santa Maria; Paradis *et al*., 2014).

21) *CALICOTOMO INFESTAE-OLEETUM SYLVESTRIS* Gianguzzi & Bazan 2019

TYPICUM Gianguzzi & Bazan 2019

Holotypus – Rel. 112, Tab. S6, in Gianguzzi & Bazan (2019a).

Phytosociological data – Tab. 1, col. 21a (from Gianguzzi & Bazan, 2019a: Tab. S6, rels. 104-115).

Diagnostic species – Olea europaea var. *sylvestris* (dom.), *Calicotome infesta*, *Rubus ulmifolius*, *Rosa sempervirens*, *Pyrus spinosa*, *Erica arborea*, *Cistus salvifolius*, *C. monspeliensis*, *Pulicaria odora*.

Short description – Wood or microwood formation dominated by *Olea europaea* var. *sylvestris*, spread throughout the coastal belt up to about 500 m a.s.l. (online Appendix II, Fig. 2d); in the coenosis floristic community, the presence of acidophilous elements stands out (*Erica arborea*, *Cistus salvifolius*, *C. monspeliensis*, *Pulicaria odora*, etc.). In the woody layer, other sclerophylls are also present (*Pistacia lentiscus*, *Phillyrea latifolia*, *Rhamnus alaternus*, etc.) as well as climbers (*Asparagus acutifolius*, *Smilax aspera*, *Rubia peregrina*, *Rubus ulmifolius*, etc.) with a sparse herbaceous layer.

Bioclimate – Mediterranean pluviseasonal-oceanic (thermo- and mesomediterranean with a subhumid ombrotype; Gianguzzi 1999a; Gianguzzi *et al*., 2012).

Substrate – Sandstones, Terravecchia Formation, etc.

Vegetation series – Edapho-xerophilous, Italo-Tyrrhenian (Sicilian) thermo-mesomediterranean subhumid, silicicolous series of Oleaster (*Calicotomo infestae-Oleo sylvestris* sigmetum).

Distribution – Italy, in Sicily: Nebrodi Mountains (Mistretta, Caronia,), Madonie Mountains (Munciarrati woods, Cefaludese, etc.), Trabia Mountains, Palermo Mountains (Mirto Mountains, near Partinico), Trapani (Scorace woods and Calatafimi woods).

ASPLENIETOSUM OBOVATAE Gianguzzi & Bazan 2019

Holotypus – Rel. 117, Tab. S1, in Gianguzzi & Bazan (2019a).

Phytosociological data – Tab. 1, col. 21b (from Gianguzzi & Bazan, 2019a – Tab. S1, rels. 116-120).

Diagnostic species – Olea europaea var. *sylvestris* (dom.), *Calicotome infesta*, *Rubus ulmifolius*, *Rosa sempervirens*, *Pyrus spinosa*, *Erica arborea*, *Cistus salvifolius*, and *Rhamnus alaternus* in addition – in general with high coverage values – *Asplenium obovatum* (online Appendix II, Fig. 2f) and *Carlina hispanica* subsp. *globosa* (Gianguzzi & Bazan, 2019a).

Substrate – Metamorphites, schists, gneisses.

Bioclimate – Mediterranean pluviseasonal-oceanic (thermomediterranean subhumid, with a few penetrations intro the neighboring belts; Gianguzzi 1999a; Gianguzzi *et al*., 2012).

Vegetation series – Climatophilous and edaphomesophilous, Italo-Tyrrhenian (Eastern-Sicilian), thermo-mesomediterranean dry-subhumid, silicicolous series of Oleaster (*Calicotomo infestae-Oleo sylvestris asplenio obovatae* sigmetosum).

Distribution – Italy, in Sicily: Peloritan Mountains (online Appendix II, Fig. 2e) (Pace del Mela, Santa Lucia del Mela, Torrente Mela, Fiumara Mazzarrà, etc.).

H) *ARBUTO UNEDONIS-LAURION NOBILIS* Rivas-Martínez, Fernández-González & Loidi 1999

Short description – Scrub, permanent shrubland and forest mantles rich in laurel species, distributed in the Iberian-Atlantic sector, linked to the humid thermo-mesomediterranean and mesotemperate submediterranean zones.

Diagnostic species – Laurus nobilis, *Genista hispanica* subsp. *occidentalis*.

Suball. *ARBUTO UNEDONIS-LAURENION NOBILIS* Rivas-Martínez & Sánchez-Mata 2001

Short description – Laurel and strawberry tree communities in the Cantabrian-Atlantic and Portuguese regions (Rivas-Martínez & Sánchez-Mata, 2001; Rivas-Martínez *et al*., 2002).

Diagnostic species – See alliance.

22) *LITHODORO DIFFUSAE-OLEETUM EUROPAEAE* Bueno Sánchez & Fernádez Prieto 1991

Holotypus – Rel. 17, Tab. 2 (pp. 290-291), in Bueno Sánchez & Fernádez Prieto (1991).

Phytosociological data – Tab. 1, col. 22 (from Bueno Sánchez & Fernádez Prieto, 1991: Tab. 2).

Diagnostic species – Olea europaea var. *sylvestris* (dom.), *Lithodora diffusa*, *Brachypodium rupestre*, *Genista occidentalis*.

Short description – Low scrub formation (1.5-2 m tall) dominated by *Olea europaea* var. *sylvestris*, typical of the coastal limestone cliffs where it is shaped by the wind; it occupies small areas, rich in coarse skeleton, and preferably exposed to the south. Evergreen phanerophytes (*Laurus nobilis*, *Rhamnus alaternus*

and *Quercus ilex*) and associated climbing species (*Smilax aspera*, *Rubia peregrina* subsp. *longifolia*, *Hedera helix*, *Dioscorea communis*, *Rubus ulmifolius* and *Rosa sempervirens*) associate with it; the herbaceous layer is not very dense. In stations sheltered by wind and with deeper soil, it can also develop more, tending towards expressions of *Quercus ilex* (Diaz Gonzalez & Prieto, 1994).

Bioclimate – Temperate hyperoceanic bioclimate (extrazonal).

Substrate – Limestone.

Vegetation series – Edapho-xerophilous, North-Iberian (Cantabric-Atlantic), thermomediterranean dry-subhumid, calcicolous series of Oleaster (*Lithodoro diffusae-Oleo sylvestris* sigmetum).

Distribution – Spain, in Asturias (Villaviciosa and Cantabria at Comillas; González & Prieto, 1994).

Discussion and conclusions

The Oleaster communities considered in this study consist of 22 associations and 16 subassociations. They make up thermophilous forest formations – high maquis, woods and micro-woods – distributed along the Mediterranean coasts, where they denote a climacic and edapho-climacic character. They are often distributed in a sparse and fragmentary manner due to the significant deforestation and the anthropogenic transformations of the region. They consist primarily of wood and microwood forest formations that are about (4) 6-7 (10) m tall, and prevalently tend to represent "series heads" – aside from *Dorystaecho hastatae-Oleetum oleastri* Kurt *et al*., 2015, as a secondary stage of the *Pinus brutia* pine grove – in the infra- and thermomediterranean belt (with a few penetrations into the mesomediterranean) with a dry-subhumid (and sometimes even humid) ombrotype.

These Oleaster-dominated phytocoenoses show a notable physiognomical and structural homogeneity. However, as shown in Table 1, the Mediterranean associations show a clear floristic differentiation, related to the area's distinct biogeographic sectors and ecological zones. It is therefore possible to subdivide them into three different orders (*Pistacio-Rhamnetalia alaterni*, *Quercetalia calliprini* and *Quercetalia ilicis*) and into various alliances.

The coastal associations that tend towards the Central-Western area of the Mediterranean basin are part of the *Pistacio-Rhamnetalia alaterni* order, which is subdivided into four alliances with different biogeographic and bioclimatic characteristics:

a) *Tetraclini articulatae-Pistacion atlanticae*, with the suballiance *Pistacienion atlanticae* is distributed in the continental arid and semi-arid region of the Maghreb;

b) *Asparago albi-Rhamnion oleoidis* is distributed in the semi-arid to subhumid Iberian-Maghreb regions;

c) *Arbuto unedonis-Laurion nobilis*, with the suball. *Arbuto-Laurenion nobilis*, is spread along the Atlantic coasts of the Iberian Peninsula and southern Spain, near Gibraltar;

d) *Oleo sylvestris-Ceratonion siliquae* is present in the central Mediterranean region, on carbonate-based substrate.

The coastal associations of the eastern part of the Mediterranean basin are part of the *Quercetalia calliprini* order, including the single alliance *Ceratonio-Pistacion lentisci*. These coenoses, as can be observed in the synoptic table (Tab. 1, cols. 11a-15b), show an evident group of East-Mediterranean *taxa*. For this reason, unlike Mucina *et al*. (2016), we propose to classify the *Ceratonio-Pistacion lentisci* within the order *Quercetalia calliprini* and not in the order *Pistacio-Rhamnetalia alaterni*.

The most mesophilous associations of the central-western part of the Mediterranean basin, that are linked to the sub-humid thermomediterranean and mesomediterranean belt, are also part of the *Quercetalia ilicis* order. They are ascribed to the following alliances:

a) *Querco rotundifoliae-Oleion sylvestris*, of the calcicolous substrates of the western Mediterranean subregion;

b) *Fraxino orni-Quercion ilicis*, of the calcicolous substrates of the central Mediterranean subregion;

c) *Erico-Quercion ilicis*, of the siliceous substrates of the central Mediterranean region).

Associations located in marginal conditions in the area include *Lithodoro diffusae-Oleetum europaeae* Bueno Sánchez & Fernádez Prieto 1991 (an edapho-climacic and relictual coenosis found on the Atlantic coastal limestone cliffs of the Asturias), *Spiraeo crenatae-Oleetum sylvestris* Karaer *et al*. 2010 (described for the central region of the Black Sea, at the north-western extremes of the species range), as well as the North-African associations located at the southern-most point of the distribution range.

The "Bioclimatic map of the Mediterranean area" produced (Fig. 2) shows new original data created using different datasets. Indeed, the CHELSA dataset, used in this study, shows a more consistent relationship between the terrain features and the resulting precipitation distribution patterns (Karger *et al*. 2017) than the WorldClim bioclimatic dataset (Hijmans *et al*., 2005) used in previous bioclimatic maps.

When we combine the distribution of *Olea europaea* var. *sylvestris* coenoses with a bioclimatic map (Fig. 2) it is possible to show that almost all Oleaster communities (21 out of 22) occur in the Mediterranean pluviseasonal-oceanic bioclimate type. In fact, only one association (*Lithodoro diffusae-Oleetum europaeae* Bueno Sánchez & Fernádez Prieto 1991) has an extrazonal distribution in the sub-coastal areas of the north-

ern Iberian Peninsula occurring within the temperate hyperoceanic bioclimate.

The principal component analysis reflects the biogeographic and bioclimatic differentiation of the eight alliances (Fig. 3). The first axis (PC1) is positively correlated with the thermicity (Tab. 3) The cluster of *Oleo sylvestris-Ceratonion siliquae*, from the central Mediterranean Region, shows a significant gradient in the direction of the Mean annual temperature (T) and Compensated thermicity index (Itc) vectors.

A strong geographical east-west gradient (r2=0.61) is indicated by the second axis (PC2) that is negatively correlated with the simple continentality (Ic) (the range or amplitude between the average temperatures of the most extreme months of the year), thus showing therefore higher oceanicity for the western alliances (*Asparago albi-Rhamnion oleoidis*, *Querco rotundifoliae-Oleion sylvestris*, *Arbuto unedonis-Laurion nobilis*) with respect to the eastern one (*Ceratonio-Pistacion lentisci*).

Despite the relationship between the Annual ombrothermic index (Io) and the first PCA axis (PC1), the length of the vector in the ordination diagrams indicates a low correlation between Io and the Oleaster communities.

Tab. 3 - Correlation of the axes of PCA with Environmental parameters and indices: T= Mean annual temperature (°C); Pp Annual positive precipitation (mm); Itc= Compensated thermicity index; Io = Annual ombrothermic index; Ic = Simple continentality index. Signif. Codes: '**' 0.01. Permutation: free. Number of permutations: 999.

Bioclimatic variables	PC1	PC2	r2	Pr(>r)	Signif.
T	0.91637	-0.40032	0.1405	0.240	
P	-0.59185	-0.80605	0.0154	1.000	
Io	-0.95670	-0.29109	0.0231	1.000	
Itc	0.91668	0.39963	0.3022	0.005	**
Ic	-0.45329	-0.89136	0.6116	0.005	**

The list of the species found in the surveyed Oleaster communities reported in Tab. 1 shows a floristic set made up of 340 infrageneric entities, 148 of which are typical of the aforementioned vegetation classes. These coenoses tend to make up "series head" formations, which are generally edaphophilous and climatophilous; for this reason, elements from other vegetation classes tend to be among the "companion" species. This is particularly true for species of the

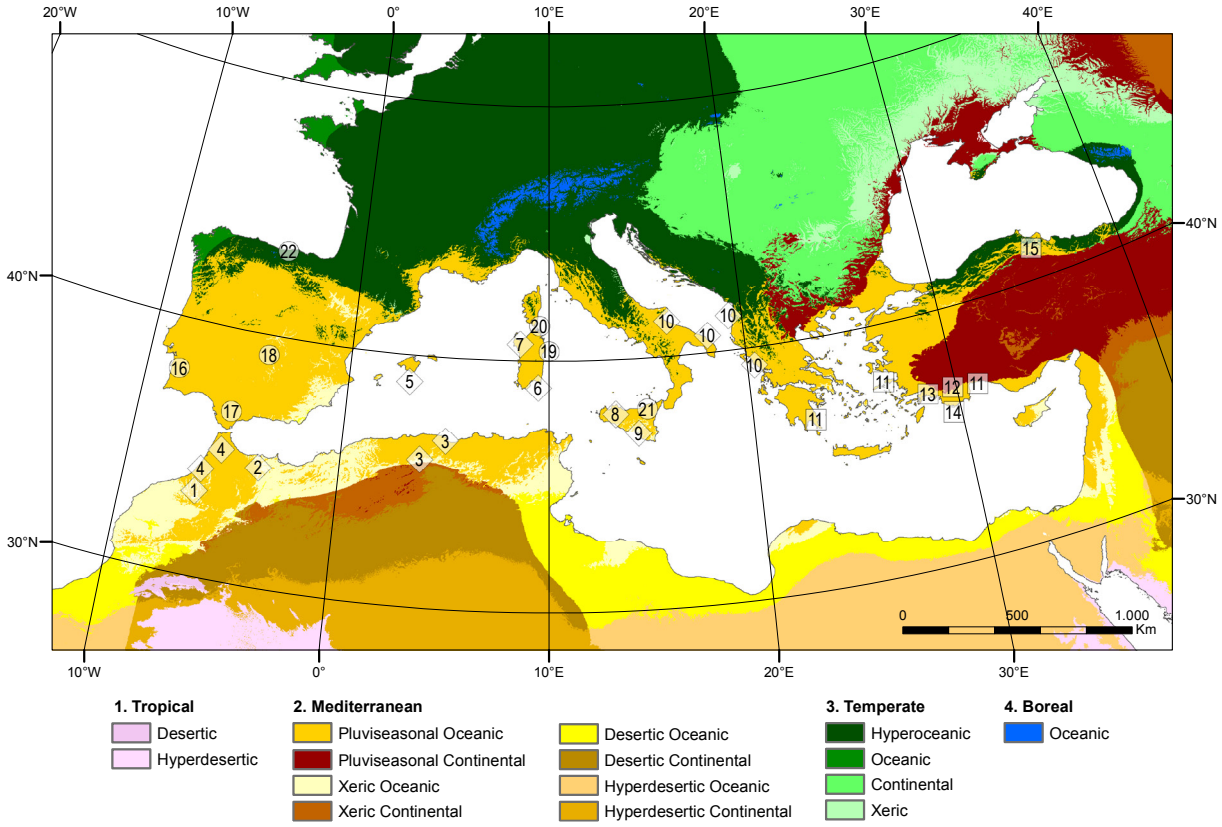


Fig. 2 - Bioclimatic Maps of the Mediterranean area produced following the Worldwide Bioclimatic Classification System (Rivas-Martínez *et al*., 2011), using precipitation and temperature data from 'CHELSA' (Karger *et al*., 2017) precipitation and temperature data. Numbers indicate the syntaxa reported in the online Appendix I.

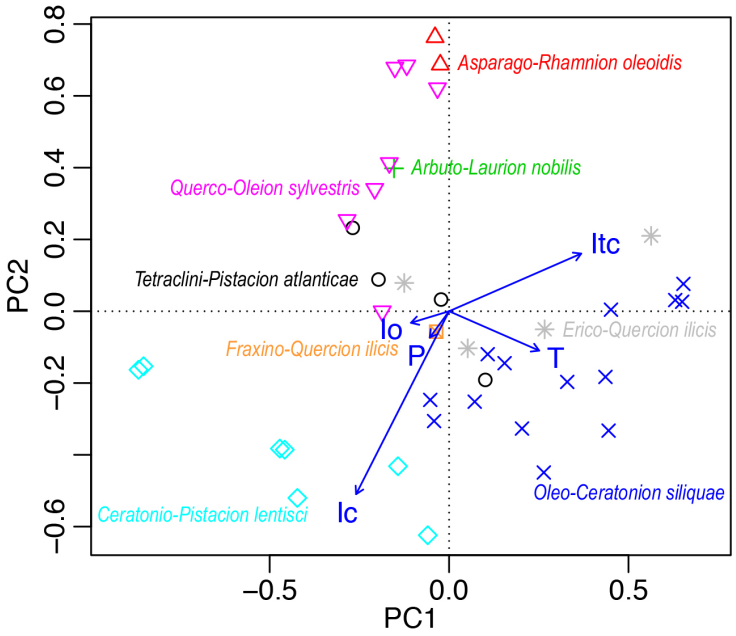


Fig. 3 - Principal component analysis (PCA) diagrams of the *Olea europaea* var. *sylvestris* communities investigated in Mediterranean Region (Tab. 1) with bioclimatic variables [T= Mean annual temperature (°C); P Annual positive precipitation (mm); Itc= Compensated thermicity index; Io = Annual ombrothermic index; Ic = Simple continentality index]. The symbols refer to the different alliances in which Oleaster formations are divided: (△) *Asparago-Rhamnion oleoidis*; (+) *Arbuto-Laurion nobilis*; (▽) *Querco-Oleion sylvestris*; (○) *Tetraclini-Pistacion atlanticae*; (*) *Erico-Quercion ilicis*; (□) *Fraxino-Quercion ilicis*; (×) *Oleo-Ceratonion siliquae*; (◇) *Ceratonio-Pistacion lentisci*.

classes *Rhamno-Prunetea* and *Lygeo-Stipetea* which are, in fact, transgressive from the surrounding communities in catenal or dynamic contact, and thus develop a vegetational mosaic.

Regarding syndynamics, the Oleaster-dominated communities take part in various vegetation series that are both climatophilous and edaphic, which make contact with the alo-subalophilous coastal aspects near the sea, prevalently ascribed to the *Crithmo-Limonietea* and *Pegano-Salsoletea* classes. Inland, they develop up to 600-700 m a.s.l., forming relationships with various other vegetation series, sometimes belonging to scrub coenoses, sometimes belonging to both evergreen and deciduous forest formations. These catenal contacts may change according to the different geographic zones, as well as to the different types of soil and bioclimatic conditions.

Given their importance, fragmentation and relative relictual nature, the Oleaster-domitated communities are catalogued among the "habitats of community interest" listed in Annex I of the Habitat Directive 92/43/EEC, issued by the European Union (code 9320 Olea and Ceratonia forests). In accordance with the IUCN-CMP Unified Classification of Direct Threats (IUCN-CMP, 2012), the main threats (Gianguzzi & Perrino, 2016; Gigante *et al*., 2016) are attributable to the following categories – 1.1 - Habitat loss/degradation, agriculture (habitat destruction, using areas for agriculture); 1.4. Infrastructure development (stations in the coastal belt often suffer from the effects of construction and urban development); 2.1. Competitors (a sporadic naturalization of alien species sometimes occurs in the species' habitat, such as *Opuntia ficus-indica*, *Pennisetum setaceum*; see Gianguzzi *et al*., 1996, 2015; Gianguzzi & Bazan, 2019a), etc.); 10.5 – Human disturbance, fire; 12.1 Other threats (risk factors connected to the relictual nature of the stations, to the extreme fragmentation of the habitat and to the small number of populations).

Considering the threatened status and the particularity of these formations, immediate actions to conserve the most representative sites and most mature communities are recommended in the hopes of limiting further erosion of the floristic-phytocoenotic biodiversity and its structural degradation.

Acknowledgment

The authors would like to thank the anonymous reviewers for the helpful reading and the suggestions that improved the overall quality of the text.

The bioclimatic analyses and mapping done in this work have been performed under the Project HPC-EUROPA3 (INFRAIA-2016-1-730897), with the support of the EC Research Innovation Action under the H2020 Programme; in particular, we gratefully acknowledge the support of Dr. Rowan Fealy of Maynooth University (Ireland) and the computer resources and technical support provided by Irish Centre for High-End Computing – ICHEC (Beneficiary: Prof. G. Bazan).

Syntaxonomic scheme

QUERCETEA ILICIS Br.-Bl. in Br.-Bl., Roussine & Nègre 1952
PISTACIO LENTISCI-RHAMNETALIA ALATERNI Rivas-Martínez 1975
Tetraclini articulatae-Pistacion atlanticae Rivas-Martínez, Costa & Izco 1986
Pistacienion atlanticae Barbero, Quézel & Rivas-Martínez 1981
Phillyreo latifoliae-Oleetum Barbero, Quézel & Rivas-Martínez 1981 ex Gianguzzi & Bazan ass. nova *hoc loco*
Calicotomo intermediae-Oleetum sylvestris Quézel, Barbero, Benabid, Loisel & Rivas-Martínez ex Gianguzzi & Bazan ass. nova *hoc loco*
Bupleuro fruticosi-Euphorbietum dendroidis Géhu, Kaabeche & Gharzouli 1992
Asparago albi-Rhamnion oleoidis Rivas Goday ex Rivas-Martínez 1975
Tamo communis-Oleetum sylvestris Benadid ex Pérez Latorre, Galàn de Mera, Deil & Cabezudo 1996
oleetosum sylvestris Benadid ex Pérez Latorre, Galàn de Mera, Deil & Cabezudo 1996
fraxinetosum angustifoliae Benadid ex Pérez Latorre, Galàn de Mera, Deil & Cabezudo 1996
Oleo sylvestris-Ceratonion siliquae Br.-Bl. ex Guinochet & Drouineau 1944
Prasio majoris-Oleetum sylvestris Bolòs & Molinier 1969
Asparago albi-Oleetum sylvestris Bacchetta, Bagella, Biondi, Farris, Filigheddu & Mossa 2003
Asparago acutifolii-Oleetum sylvestris Bacchetta, Bagella, Biondi, Farris, Filigheddu & Mossa 2003
loniceretosum implexae Bacchetta, Bagella, Biondi, Farris, Filigheddu & Mossa 2003
anagyrietosum foetidae Bacchetta, Bagella, Biondi, Farris, Filigheddu & Mossa 2003
Ruto chalepensis-Oleetum sylvestris Gianguzzi & Bazan 2019
oleetosum sylvestris Gianguzzi & Bazan 2019
cercidetosum siliquastri Gianguzzi & Bazan 2019
celtidetosum australis Gianguzzi & Bazan 2019
euphorbietosum bivonae Gianguzzi & Bazan 2019
rhamnetosum oleoidis Gianguzzi & Bazan 2019
periplocetosum angustifoliae Gianguzzi & Bazan 2019
Chamaeropo humilis-Oleetum sylvestris Gianguzzi & Bazan 2019
acanthetosum mollis Gianguzzi & Bazan 2019
ephedretosum fragilis Gianguzzi & Bazan 2019
Hippocrepido emeroidis-Oleetum sylvestris ass. nova
QUERCETALIA CALLIPRINI Zohary 1955
Ceratonio-Pistacion lentisci Zohary & Orshan 1959
Rubio tenuifoliae-Euphorbietum dendroidis Géhu, Costa & Uslu 1988
Junipero foetidissimae-Oleetum sylvestris ass. nova
Querco aucheri-Oleetum Vural, Duman, Güner, Dönmez & Şağban 1995
Dorystaecho hastatae-Oleetum oleastri Kurt, Ketenoğlu, Akman, Özdeniz, Şekerciler, Bölükbaşı & Özbey 2015
Spiraeo crenatae-Oleetum sylvestris Karaer, Kilinc, Korkmaz, Guray Kutbay, Yalcin & Bilgin, 2010
QUERCETALIA ILICIS Br.-Bl. ex Molinier 1934
Querco rotundifoliae-Oleion sylvestris Barbéro, Quézel & Rivas-Martínez in Rivas-Martínez, Costa & Izco 1986
Viburno tini-Oleetum sylvestris J.C. Costa, Capelo & Lousa 1994
typicum
ephedretosum fragilis Neto, Arsénio, & Costa 2009
fraxinetosum angustifoliae Costa, Capelo & Lousa 1994
Aro neglecti-Oleetum sylvestris Rivas-Martínez & Cantò 2002 corr. Rivas-Martínez & Cantò
typicum
fraxinetosum angustifoliae Pérez Latorre, Galán de Mera, Deil & Cabezudo ex Gianguzzi & Bazan subass. nova *hoc loco*
Rhamno laderoi-Oleetum sylvestris (Cantò, Ladero, Perez-Chiscano & Rivas-Martínez 2011) nom. nov. prop.
Fraxino orni-Quercion ilicis Biondi, Casavecchia & Gigante ex Biondi, Casavecchia & Gigante in Biondi, Allegrezza, Casavecchia, Galdenzi, Gigante & Pesaresi 2013
Cyclamino repandi-Oleetum sylvestris Bacchetta, Bagella, Biondi, Farris, Filigheddu & Mossa 2003
Erico arboreae-Quercion ilicis Brullo, Di Martino & Marcenò 1977

Myrto communis-Oleetum sylvestris Bacchetta, Bagella, Biondi, Farris, Filigheddu & Mossa 2003
Calicotomo infestae-Oleetum sylvestris Gianguzzi & Bazan 2019
typicum
asplenietosum obovatae Gianguzzi & Bazan 2019
Arbuto unedonis-Laurion nobilis Rivas-Martínez, Fernández-González & Loidi 1999
Arbuto unedonis-Laurenion nobilis Rivas-Martínez & Sanchez-Mata 2001
Lithodoro diffusae-Oleetum europaeae Bueno Sánchez & Fernádez Prieto 1991

References

Aimè S., 1991. Etude écologique de la transition entre les bioclimats Sub-Humide et aride dans l'étage thermoméditerranéen du tell Oranais (Algérie occidentale) (Doctoral dissertation, Thèse Doct. Fac. Sci. et tech. St-Jérôme, Marseille, 194p+ annexes 23-ADI N., 2001. Contribution à l'étude bioclimatique des formations à *Salsola vermiculata* le long d'un gradient de salinité dans la région du chott chergui (Sud oranais). Thèse Mag. Fac. Bio. Univ. Alger, 118p).

Akman Y., Barbero M. & Quézel P., 1978. Contribution a l'etude de la vegetation forestiere d'Anatolie mediterraneen. Phytocoenol. 5: 1-79.

Amara M., 2014. Contribution à l'étude des groupements à *Pistacia atlantica* subsp. *atlantica* dans le Nord-Ouest algérien [dissertation]. Tlemcen (Algeria). University of Abou Bekr Belkaid Tlemcen (UABT).

Arrigoni P.V., 1968. Fitoclimatologia della Sardegna. Webbia 23 (1): 1-100.

Aykut Y., Emel U. & Tekin B.M., 2017. Morphological variability of evergreen oaks (*Quercus*) in Turkey. Bangladesh J. Plant Taxonomy 24 (1): 39-47.

Bacchetta G., Bagella S., Biondi E., Farris E., Filigheddu, R. & Mossa L., 2003. Su alcune formazioni a *Olea europaea* L. var. *sylvestris* Brot. della Sardegna. Fitosociol. 40 (1): 49-53.

Bacchetta G., Bagella S., Biondi E., Farris E., Filigheddu R. & Mossa L., 2009. Vegetazione forestale e serie di vegetazione della Sardegna (con rappresentazione cartografica alla scala 1 : 350.000). Fitosociol. 46 (1 suppl. 1): 3-82.

Bacchetta G., Bagella S., Biondi E., Farris E., Filigheddu R. & Mossa L., 2010. Le serie di vegetazione della regione Sardegna. In: Blasi C., La vegetazione d'Italia, 471-495. Palombi.

Barbero M., Quézel P. & Rivas-Martínez S., 1981. Contribution a l'étude des groupements forestiers et préforestièrs du Maroc. Phytocoenol. 9 (3): 311-412.

Bartolini G., Petruccelli R., Tindall., H.D. & Menini U.G., 2002. Classification, origin, diffusion and history of the olive. Rome: Food and Agriculture Organization of the United Nations; p. 21-26.

Bazan G., Castrorao Barba A., Rotolo A. & Marino P. 2019. Geobotanical approach to detect land-use change of a Mediterranean landscape: a case study in Central-Western Sicily. GeoJournal 84 (3): 795-811.

Bazan G. & Marino P., 2016. Il ruolo dell'Oleastro Inveges di Sciacca nella definizione del paesaggio forestale storico della Sicilia. In 1° Convegno Nazionale Alberi Monumentali.

Bazan G., Marino P., Guarino R., Domina G. & Schicchi R. 2015. Bioclimatology and vegetation series in Sicily: a geostatistical approach. Ann. Bot. Fennici 52 (1-2):1-18.

Conoscenza, Conservazione, Valorizzazione. CIRITA-Università degli Studi di Palermo.

Benabid A., 1984. Étude phytogéographique des peuplements forestiers et pré-forestiers du Rif centro-occidental (Maroc). Trav. Inst. Sci. Sér. Bot. 34.

Bianco P., Bedalov M., Medagli P. & Mastropasqua L., 1984. Un contributo alla conoscenza dell'associazione *Oleo-Euphorbietum dendroidis* Trinajstic nelle stazioni pugliesi e confronto con quelle dell'Adriatico orientale jugoslavo. Not. Fitosoc. 19 (2): 23-28.

Biondi E., Blasi C, Allegrezza M., Anzellotti I., Azzella M. M., Carli E., Casavecchia S., Copiz R., Del Vico E., Facioni L., Galdenzi D., Gasparri R., Lasen C., Pesaresi S., Poldini L., Sburlino G., Taffetani F., Vagge I., Zitti S. & Zivkovic L., 2014. Plant communities of Italy: The Vegetation Prodrome. Plant Biosyst. 148(4): 728-814.

Biondi E. & Géhu J.M., 1987. A study of some phytocoenoses of *Euphorbia dendroides* L. found in Greece. Acta Bot. Croatica 46(1): 81-84.

Biondi E., Bagella S., Casavecchia S. & Pinzi M., 2002. La vegetazione arbustiva di un settore costiero dell'adriatico centrale italiano. Fitosociol. 39 (1 Suppl 2): 75-80.

Bolòs O. de, 1996. La vegetació de les Illes Balears. Comunitats de plantes. Inst Estud Catalans. Arxius secc de Ciènc. 114: 1-267.

Bolos O.D., Molinier R. & Montserrat P., 1970. Observations phytosociologiques dans l'ile de Minorque. Acta Geobot. Barcinonensia 5: 1-147.

Bolòs O. de & Molinier R., 1969. Vue d'ensemble de la végétation des Îles Baléares. Vegetatio 17 (1): 251-270.

Brullo S., Gianguzzi L., La Mantia A. & Siracusa G., 2008. La classe *Quercetea ilicis* in Sicilia. Boll. Ac-

cad. Gioenia Sci. Nat. Catania. 41 (369): 1-77.
Brullo S., Guarino R., Minissale P., Scelsi F. & Spampinato G., 2004. Indagine fitosociologica sulla vegetazione forestale dell'Egeo meridionale. Coll. Phytosoc. 28: 401-466.
Brullo S., Marcenó C. & Di Martino A., 1977. La vegetazione di Pantelleria (studio fitosociologico). Ist. Bot. Univ. Catania.
Bueno Sánchez A. & Fernández Prieto A.J.A., 1991. Acebuchales y lauredales de la costa cantábrica. Lazaroa 12: 273-301.
Carlstrom A.L.B., 1987. A survey of the flora and phytogeography of Rodhos, Simi, Tilos and the Marmaris Peninsula (SE Greece, SW Turkey). Department of Systematic Botany, University of Lund, pp. 303.
Cantó P., 2004. Estudio fitosociológico y biogeográfico de la Sierra de San Vicente y tramo inferior del valle del Alberche (Toledo, España). Lazaroa, 25: 187-249.
Caruso T., Marra F.P., Costa F., Campisi G., Macaluso L. & Marchese A., 2014. Genetic diversity and clonal variation within the main Sicilian olive cultivars based on morphological traits and microsatellite markers. Sci. Horticult. 180: 130-138.
Costa J.C., Capelo J.H. & Lousa M., 1994. Os bosques de zambujeiro (*Olea europaea* L. var. *sylvestris* Miller): vegetaçao potencial dos vertisolos das áreas termomediterranicas da Estremadura portuguesa. Anais do Instituto Superior de Agronomia.
Davis P.H. (ed.), 1965-88. Flora of Turkey and the East Aegean Islands, Volume 1-10 Edinburgh Universty Press, Edinburgh.
Euro+Med, 2006-2019. Euro+Med PlantBase - the information resource for Euro-Mediterranean plant diversity. available online at http://ww2.bgbm.org/EuroPlusMed/ [accessed 2019 Sep 20].
Fascetti S. & Veri L., 1984. Aspetti serali della macchia mediterranea tra Neuti e Dubrovnik. Not. Fitosoc. 19 (1): 115-122.
Fennane M., 1988. Phytosociologie des tétraclinaies marocaines. Bull. Inst. Sci, 12: 99-148.
Fornós J.J. & Gelabert B., 2011. Condicionants litològics i estructurals del carst a les illes Balears. Endins – publicació d'espeleologia, 35: 37-52.
Galán De Mera A., Corté J. & García I.S., 2000. La vegetación del Peñon de Gibraltar. Acta Bot. Malacitana 25: 107-130.
Gaži-Baskova V. & Bedalov M., 1983. Flora Kornatskog otočja. Povremena izdanja grada Šibenika sv. 10, Zbornik Roberta Visianija 443-454, Šibenik.
Géhu J.M. & Biondi E., 1997. Sur les variations floristico-corologiques de l'*Oleo-Euphorbietum dendroidis* Trinajstic (1973) 1984. Fitosociol. 32: 153-159.
Géhu J.M., Costa M. & Uslu T., 1988. Aperçu synécologique d'Euphorbia dendroides sur le littoral méridional de la Turquie. Doc. Phytosoc. 11: 607-612.
Géhu J.M., Apostolides N., Géhu-Franc J. & Arnold K., 1989. Premières données sur la végétation littorale des iles de Rodhos et de Karpathos (Grèce). Coll. Phytosoc. 19: 545-582.
Géhu J.M., Kaabeche M. & Gharzouli R., 1992. Observations phytosociologiques sur le littoral kabyle de Bejaia à Djijel. Doc. Phytosoc. 14: 305-322.
Géhu J.M., Kaabeche M. & Gharzouli R., 1994. Observations phytosociologiques dans le Nord-Est de l'Algerie. Phytocoenol. 24: 369-382.
Gianguzzi L. & Bazan G., 2019a. A phytosociological analysis of the *Olea europaea* L. var. *sylvestris* (Mill.) Lehr. forests in Sicily. Plant Biosyst., DOI: 10.1080/11263504.2019.1681532.
Gianguzzi L. & Bazan G., 2019b. Notes on syntaxonomy, chorology and dynamics of *Olea europaea* L. var. *sylvestris* (Mill.) Lehr. forests in the Mediterranean landscape. 114° Congresso della Società Botanica Italiana, Padova, 4-7 September 2019: 67.
Gianguzzi L. & La Mantia A. 2000. Caratteristiche geografiche e bioclimatiche. In Gianguzzi L., Ottonello D. (eds.), La Riserva di Monte Cofano (Sicilia nord-occidentale). Aspetti geomorfologici, naturalistici ed etnoantropologici. Collana Sicilia Foreste 8: 11-24, Azienda Foreste Demaniali della Regione Siciliana. Palermo.
Gianguzzi L. & Perrino E.V. 2016. 9320 Foreste di Olea e Ceratonia. In: Angelini P, Casella L, Grignetti A, Genovesi P, editors. Manuali per il monitoraggio di specie e habitat di interesse comunitario (Direttiva 92/43/CEE) in Italia: habitat. Roma: ISPRA, Serie Manuali e Linee Guida; p. 248-249
Gianguzzi L., 1999. Flora e vegetazione dei Nebrodi. Itinerari didattici. Regione Siciliana, Sezioni Operative per l'Assistenza Tecnica nn° 5, 7, 8,10, 11, pp. 232. S. Agata di Militello (ME).
Gianguzzi L., Scuderi L. & Pasta S., 2006. La flora vascolare dell'Isola di Marettimo (Arcipelago delle Egadi, Canale di Sicilia): aggiornamento ed analisi fitogeografica. Webbia 61 (2): 359-402.
Gianguzzi L., Papini F. & Cusimano D., 2015a. Phytosociological survey vegetation map of Sicily (Mediterranean region). J. Maps 12 (5): 845-851.
Gianguzzi L. & Papini F. 2015b. Vegetation map of Sicily (scale 1:250.000). In: Gianguzzi L, Papini F, Cusimano D, Phytosociological survey vegetation map of Sicily (Mediterranean region). J. Maps 12 (5): 845-851.
Gianguzzi L., Ilardi V. & Raimondo F.M., 1996. La vegetazione del promontorio di Monte Pellegrino (Palermo). Quad. Bot. Amb. Appl. 4 (1993): 79-137.
Gianguzzi L., Scuderi L. & Pasta S., 2006. La flora vascolare dell'Isola di Marettimo (Arcipelago delle Egadi, Canale di Sicilia): aggiornamento ed analisi

fitogeografica. Webbia 61 (2): 359-402.
Gianguzzi L., D'Amico A. & Romano S., 2010. Phytosociological remarks on residual woodlands of *Laurus nobilis* in Sicily. Lazaroa 31: 67-84.
Gianguzzi L., Ilardi V., Caldarella O., Cusimano D., Cuttonaro P. & Romano S., 2012. Phytosociological characterization of the *Juniperus phoenicea* L. subsp. *turbinata* (Guss.) Nyman formations in the Italo-Tyrrhenian Province (Mediterranean Region). Plant Sociol. 49 (2): 3-28.
Gianguzzi L., Cusimano D., Cuttonaro P., Gianguzzi G. & Romano S., 2014. Distribution, ecology and conservation survey on the *Celtis tournefortii* subsp. *aetnensis* (*Celtidaceae-Cannabaceae*) populations in Sicily. Webbia 69 (2): 325-334.
Gianguzzi L., Cusimano D., Ilardi V. & Romano S. 2015b. Phytosociological analysis of the *Genista* sp. pl. garrigues of the *Cisto-Lavanduletea* and *Rosmarinetea officinalis* classes in the South-Tyrrhenian area (Mediterranean Region). Plant Biosyst. 149 (3): 574-588.
Gianguzzi L., Cuttonaro P., Cusimano D. & Romano S., 2016. Contribution to the phytosociological characterization of the forest vegetation of the Sicani Mountains (inland of the North-Western Sicily). Plant Sociol. 53 (1): 5-43.
Gianguzzi L., 2017. L'Isola di Pantelleria. In: Blasi C, Biondi E. La flora in Italia. Roma: Sapienza Università Editrice, Roma; p. 396-399.
Gigante D., Attorre F., Venanzoni R., Acosta A.T.R., Agrillo E., Aleffi M., *et al.*, 2016. A methodological protocol for Annex I Habitats monitoring: the contribution of Vegetation science. Plant Sociol. 53 (2): 77-87.
González T.E.D. & Prieto J.A.F., 1994. La vegetación de Asturias. Itiner. Geobot. 8: 243-528.
Guinochet M., 1980. Essai sur quelques syntaxons des *Cisto-Rosmarinetea* et des *Quercetea ilicis* d'Algérie et de Tunisie. Phytocoenol. 436-466.
Hadjadj-Aoul S. & Loisel R., 1999. Syntaxonomie des peuplements algériens du Thuya de Berbérie (*Tetraclinis articulata* (Vahl) Masters). Les peuplements forestiers et préforestiers. Doc. Phytosoc. NS, 19, 229-285.
Hijmans R.J., Cameron S.E., Parra J.L., Jones P.G., & Jarvis A., 2005. Very high resolution interpolated climate surfaces for global land areas. Int. J. Climatol.: A Journal of the Royal Meteorological Society, 25(15): 1965-1978.
IUCN–CMP, 2012. Unified Classification of Direct Threats, Version 3.2. [accessed 2010 Dec 10]. – http://www.iucnredlist.org/documents/Dec_2012_Guidance_Threats_Classification_Scheme.pdf.
Karaer F., Kilinc M., Korkmaz H., Guray Kutbay H., Yalcin E. & Bilgin A., 2010. Phytosociological and ecological structure of Mediterranean enclaves along the stream valleys in inner parts of Black Sea region. J. Environ. Biol. 31 (1): 33-50.
Karger D.N., Conrad O., Böhner J., Kawohl T., Kreft H., Soria-Auza R.W., Zimmermann N.E., Linder H.P. & Kessler M., 2017. Climatologies at high resolution for the earth's land surface areas. Scientific Data 4, 170122.
Korkmaz H., Engin A., Kutbay H.G. & Yalcin E., 2011. A syntaxonomical study on the scrub, forest, and stepe vegetation of the Kızılırmak valley. Turk. J. Bot. 35 (2): 121-165.
Kurt L., Ketenoğlu A.O., Akman Y., Özdeniz E., Şekerciler F., Bölükbaşi A. & Özbey B.G., 2015. Syntaxonomic analysis of the preforest and forest vegetation in the thermo-and eumediterranean zone around Antalya Gulf, Turkey. Turk. J. Bot. 39 (3): 487-498.
Liphschitz N., Gophna R., Hartman M. & Biger G., 1991. The beginning of olive (*Olea europaea*) cultivation in the Old World: a reassessment. J. Archaeological Sci. 18 (4): 441-453.
Lisai G. & Maccioni A., 2017. Il giro della Sardegna in 501 luoghi. Newton Compton Editori.
Maire R., 1937. Contributions à l'étude de la Flore de l'Afrique du Nord, fasc. 25. Bull. Soc. Hist. Nat. Afr. Nord 28: 332-388.
Marcuzzi G., 1996. Il rapporto uomo-olivo: un problema di ecologia umana. Ann. Museo Civ. Rovereto. 12: 15-84.
Meddour R., Meddour-Sahar O., Zeraia L. & Mucina L., 2017. Syntaxonomic synopsis of the forest and tall scrub vegetation of Northern Algeria. Lazaroa 38 (2): 127.
Meddour R., Meddour-Sahar O., Derridj A. & Géhu J.M., 2010. Synopsis des groupements végétaux forestiers et préforestiers de la Kabylie djurdjuréenne (Algérie). Rev. For. France 62: 295-308.
Meusel H., Jäger E. eds., 1998. Vergleichende Chorologie der Zentraleuropäischen Flora - Band I, II, III (Gustav Fischer Verlag, Jena,).
Molinier R., 1954. Les climax côtiers de la Méditerranée occidentale. Vegetatio 4 (5): 284-308.
Mucina L., Bültmann H., Dierßen K., Theurillat J., Raus T., Čarni A., Šumberová K., Willner W., Dengler J., García R. G., Chytrý M., Hájek M., Di Pietro R., Iakushenko D., Pallas J., Daniëls F. J., Bergmeier E., Santos Guerra A., Ermakov N., Valachovič M., Schaminé J. H., Lysenko, T., Didukh Y. P., Pignatti S., Rodwell J. S., Capelo J., Weber H. E., Solomeshch A., Dimopoulos P., Aguiar C., Hennekens S. M. and Tichý L., 2016. Vegetation of Europe: hierarchical floristic classification system of vascular plant, bryophyte, lichen, and algal communities. Appl. Veg. Sci. 19: 3-264.
Neto C., Arsénio P. & Costa J.C., 2009. Flora e Vegetação do sudoeste de Portugal continental. Quercetea

9: 43-144.

Panno D., Beccali G., Beccali M., Galletto J., Messineo A. & Riccio G., 2008. Usi energetici dei residui agricoli della coltivazione cerealicola in associazione con colture no food di rotazione: un caso studio nel Comprensorio Madonita mediante GIS. In 63° Congresso Nazionale Associazione Termotecnica Italiana (ATI).

Paradis G., Feral C., Passigny-Hernandez C., Nicolau J. & Carles S., 2014. Paysage végétal de la vallée du Baracci et du nord du golfe de Valinco (sud-ouest de la Corse): phytosociologie et carte de la végétation. J. Soc. Bot. Fra. 67: 9-105.

Pavletić, Z. (1984). Caratteristiche della vegetazione sempreverde di alcune isolette dell'Adriatico centrale. Not. Fitosoc. 19 (1): 55-66.

Pérez Latorre A.V., Galán de Mera A., Deil U. & Cabezudo B., 1996. Fitogeografía y vegetación del sector aljíbico (Cádiz-Málaga, España). Acta Bot. Malacitana 21: 241-267.

Pignatti S., Guarino R. & La Rosa M., 2017-2018. Flora d'Italia. Vol. 1-3. Bologna: Edagricole-New Business Media.

Pignatti S., 1982. Flora d'Italia. Bologna: Edagricole.

Pignatti S., 1983. Human impact in the vegetation of the Mediterranean basin. In Holzner W., Werger M.J.A., & Ikusima I. (eds). Man's impact on vegetation. The Hague, The Netherlands: Dr W. Junk Publishers, pp. 151-161.

Primavera M., Fiorentino G. & Colaianni G., 2011. Il combustibile delle attività metallurgiche nelle forge di Lecce tardo-antica: caratteristiche della vegetazione e sfruttamento dell'ambiente. Archeometallurgia: dalla conoscenza alla fruizione, pp. 321-331

Pulevic V., 1970. Sources for bibliography on botanical research in Montenegro; survey of flora and vegetation studies up to 1942. Poljoprivreda i sumarstvo.

Quézel P., Barbero M., Benabid A., Loisel R. & Rivas-Martínez S., 1988. Contribution á l'étude des groupements préforestiers et des matorrals rifains. Ecol. Medit. 14: 77-122.

Quézel P. & Barbero M., 1986. Aperçu syntaxinomique sur la connaissance actuelle de la classe des *Quercetea ilicis* au Maroc. Ecol. Medit. 12 (3-4): 105-111.

Quézel P. & S. Santa (1962-1963). Nouvelle Flore de l'Algérie et des régions désertiques méridionales. Ed. C.N.R.S., Paris, Tomes I & II, 1170 pp.

Quézel P., Barbéro M. & Akman Y., 1980. Contribution à l'étude de la végétation forestière d'Anatolie septentrionale. Phytocoenol. 365-519.

Quézel P., Barbero M. & Akman Y., 1978. L'Interpretation phytosociologique des groupements forestiers dans le Bassin Mediterraneen Oriental. Doc. Phytosoc. 2: 329-352.

Quinto-Canas R., Vila-Viçosa C., Paiva-Ferreira R., Cano-Ortiz A. & Pinto-Gomes C., 2012. The Algarve climatophilous vegetation series – Portugal: a base document to the planning, management and nature conservation. Acta Bot. Gallica 159 (3): 289-298.

Raimondo F.M., Bazan G., Gianguzzi L., Ilardi V., Schicchi R. & Surano N., 2000. Carta del paesaggio e della biodiversità vegetale della Provincia di Palermo. Quad. Bot. Amb. Appl. 9 (1998): 3-160.

Rivas-Martínez S., 2002. Vascular plant communities of Spain and Portugal (addenda to the syntaxonomical checklist of 2001, part I). Itiner. Geobot. 15: 5-432.

Rivas-Martínez S., 2005. Notions on dynamic-catenal phytosociology as a basis of landscape science. Plant Biosyst. 139(2): 135-144.

Rivas-Martínez S., *et al*., 2011. Mapa de series, geoseries y geopermaseries de vegetación de España. Itiner. Geobot. 18(1,2): 5-800.

Rivas-Martínez S., Costa M., Soriano P., Pérez R., Llorens L. & Roselló J.A., 1992. Datos sobre el paisaje vegetal de Mallorca e Ibiza (Islas Baleares, España). Itinera geobot, 6, 5-98.

Rivas-Martínez S., Díaz T.E., Fernández-González F., Izco J., Loidi J., Lousã M. & Penas A., 2002. Vascular plant communities of Spain and Portugal. Addenda to the Syntaxonomical checklist of 2001. Itiner. Geobot. 15 (1-2): 5-922.

Rivas-Martìnez S., Fernàndez-Gonzàlez F., Loidi J., Lousã M. & Penas A,. 2001. Syntaxonomical checklist of vascular plant communities of Spain and Portugal to association level. Itiner. Geobot. 14 (2): 5-341.

Rivas-Martínez S., Penas A. & Díaz T.E., 2004. Bioclimatic and biogeographic maps of Europe. [accessed 2018 Dec 28]. www.globalclimatics.org/form/maps.htm

The Plant List. 2013. Version 1.1. [accessed 2018 Nov 28] http://www.theplantlist.org/.

Trinajstic I., 1973. O zoni sveze Oleo-Ceratonion u istocnojadranskom dijelu Balkanskog poluotoka. Ekologija 8 (2): 283-294.

Trinajstić I., 1984a. Vegetacija sveze *Oleo-Ceratonion* Br.-Bl. u Jadranskom primorju Jugoslavije. Acta Bot. Croatica 43 (1): 167-173.

Trinajstic I., 1984b. Sulla sintassonomia della vegetazione sempreverde della classe *Quercetea ilicis* Br. Bl. del litorale adriatico jugoslavo. Not. Fitosoc. 19 (1): 77-98

Trinajstić I.,1975. Novi prilog poznavanju rasprostranjenosti asocijacije *Oleo-Euphorbietum dendroidis* (*Oleo-Ceratonion*) u jadranskom primorju Jugoslavije. Acta Bot. Croatica 34 (1): 121-125

Vargas P. & Kadereit J.W., 2001. Molecular fingerprinting evidence (ISSR, inter-simple sequence repeats) for a wild status of *Olea europaea* L.(*Oleaceae*) in

the Eurosiberian North of the Iberian Peninsula. Flora 196 (2): 142-152.

Vural M., Duman H., Güner A., Dönmez A.A. & Şağban H., 1995. The vegetation of Köyceğiz-Dalyan (Muğla) specially protected area. Turk. J. Bot. 19 (4): 431-476.

Weber H.E., Moravec J. & Theurillat J-P., 2000. International code of phytosociological nomenclature. 3rd ed. J. Veg. Sci. 11: 739-768. Translated into Italian by verticicolous Scoppola A. Fitosociol. 39 (1) Suppl. 1 (2002): 5-48.

Zohary D. & Spiegel-Roy P., 1975. Beginnings of fruit growing in the Old World. Science 187 (4174): 319-327.

Zohary M. & Orshan G., 1959. The maquis of *Ceratonia siliqua* in Israel. Plant Ecology 8 (5): 285-297.

Appendix I - Phytosociological relevé sources already published in this study (numbering of the *syntaxa* corresponds to that reported in the text)

Syntaxa	Bibliographic reference and location of relevés
QUERCETEA ILICIS Br.-Bl. in Br.-Bl., Roussine & Nègre 1952	
PISTACIO LENTISCI-RHAMNETALIA ALATERNI Rivas-Martínez 1975	
Tetraclini articulatae-Pistacion atlanticae Rivas-Martínez, Costa & Izco 1986	
Suball. **Pistacienion atlanticae** Barbero, Quézel & Rivas-Martínez 1981	
1) *Phillyreo latifoliae-Oleetum* Barbero, Quézel & Rivas-Martínez ex Gianguzzi & Bazan ass. nova *hoc loco*	Barbero *et al.* (1981, Tab. 18) – Morocco (Sidi-Bettache region).
2) *Calicotomo intermediae-Oleetum sylvestris* Quézel, Barbero, Benabid, Loisel & Rivas-Martínez ex Gianguzzi & Bazan ass. nova *hoc loco*	Quézel *et al.* (1988, Tab. 8) – Morocco (Rif at Al Hoceima costal area).
3) *Bupleuro fruticosi-Euphorbietum dendroidis* Géhu, Kaabeche & Gharzouli 1992	Géhu *et al.* (1992, Tab. 1, rels. 2-3) – Algeria (Capo Carbon at Béjaïa); Guinochet (1980, Tab. 6, rel. 8) – Algeria (Northern slope of Djebel Hairech).
Asparago albi-Rhamnion oleoidis Rivas Goday ex Rivas-Martínez 1975	
4) *Tamo communis-Oleetum sylvestris* Benabid ex Pérez Latorre, Galàn de Mera, Deil & Cabezudo 1996	Benabid (1984, Tab. 2, rels. 12-30), Marocco – West Rif, from Mediterranean coast to Tingitana Peninsula (Rharb, Trifa, Sais, Doukkala, Tadla ecc.).
4.1) *oleetosum sylvestris* Benadid ex Pérez Latorre, Galàn de Mera, Deil & Cabezudo 1996	
4.2) *fraxinetosum angustifoliae* Benadid ex Pérez Latorre, Galàn de Mera, Deil & Cabezudo 1996	Benabid (1984, Tab. 2, rels. 1-4), Marocco – West Rif, from Mediterranean coast to Tingitana Peninsula (Rharb, Trifa, Sais, Doukkala, Tadla).
Oleo sylvestris-Ceratonion siliquae Br.-Bl. ex Guinochet & Drouineau 1944	
5) *Prasio majoris-Oleetum sylvestris* Bolòs & Molinier 1969	Bolòs de & Molinier (1969, rel. 1, p. 257); Bolòs de, *et al.* (1970, Tab. 2, rels. 4-9) – Baleari Island (Minorca Island).
6) *Asparago albi-Oleetum sylvestris* Bacchetta, Bagella, Biondi, Farris, Filigheddu & Mossa 2003	Bacchetta *et al.* (2003, Tab. 4) – Sardinia (Alghero province at M.te Ricciu, Scala Piccada and La Scaletta).
7) *Asparago acutifolii-Oleetum sylvestris* Bacchetta, Bagella, Biondi, Farris, Filigheddu & Mossa 2003	Bacchetta *et al.* (2003, Tab. 3) – Sardinia (Sassari province at Scala di Giocca; Alghero at Poglina).
7.1) *loniceretosum implexae* Bacchetta, Bagella, Biondi, Farris, Filigheddu & Mossa 2003	
7.2) *anagyrietosum foetidae* Bacchetta, Bagella, Biondi, Farris, Filigheddu & Mossa 2003	Bacchetta *et al.* (2003, Tab. 3) – Sardinia (Sassari province at Rio Mannu and Puttu Codinu).
8) *Ruto chalepensis-Oleetum sylvestris* Gianguzzi & Bazan 2019	Gianguzzi & Bazan (2019, Tab. S1, rel. 3 Sicily (some localities on the coast zone and hills belt).
8.1) *oleetosum sylvestris* Gianguzzi & Bazan 2019	
8.2) *cercidetosum siliquastri* Gianguzzi & Bazan 2019	Gianguzzi & Bazan (2019, Tab. S1, rel. 15) – Sicily [Mount Pellegrino (Palermo) and Mount Sparacio (Trapani)].
8.3) *celtidetosum australis* Gianguzzi & Bazan 2019	Gianguzzi & Bazan (2019, Tab. S1, rel. 19) – Sicily [Etna area's, in the coastal zone between Fontanarossa and Giarre Catania)].
8.4) *euphorbietosum bivonae* Gianguzzi & Bazan 2019	Gianguzzi & Bazan (2019, Tab. S2, rel. 21) – Sicily (carbonate outcrops located between Mount S. Calogero in Termini Imerese and M. Erice; and the Southern part of the Sicani Mountains (Pizzo Telegrafo).
8.5) *rhamnetosum oleoidis* Gianguzzi & Bazan 2019	Gianguzzi & Bazan (2019, Tab. S3, rel. 46) – Sicily (Coastal region of the Aegadian archipelago).
8.6) *periplocetosum angustifoliae* Gianguzzi & Bazan 2019	Gianguzzi & Bazan (2019, Tab. S3, rel. 57) – Sicily (Linosa and Pantelleria Islands).
9) *Chamaeropo humilis-Oleetum sylvestris* Gianguzzi & Bazan 2019	Gianguzzi & Bazan (2019, Tab. S4, rel. 83) – Sicily (Southern and North-Western part of Sicily).
9.1) *acanthetosum mollis* Gianguzzi & Bazan 2019	
9.2) *ephedretosum fragilis* Gianguzzi & Bazan 2019	Gianguzzi & Bazan (2018, Tab. S5, rel. 95) – Sicily (Palermo calcarenites (stream mouths in the Jato Valley and Castellammare del Golfo) and in Southern Sicily near Acate.
10) *Hippocrepido emeroidis-Oleetum sylvestris* ass. nova *hoc loco*	Tab. 2 (1-2, Albania, at Porto Palermo (rels. ined. – 8.7.2010); 3-7, from Trinajstic 1984 (Tab. 2, rels. 1-4 and 6-7 – Croatia – Jabuka, Obljak and Pelješac).
QUERCETALIA CALLIPRINI Zohary1955	
Ceratonio siliquae-Pistacion lentisci Zohary et Orshan 1959 (incl. *Quercion calliprini*)	
11) *Rubio tenuifoliae-Euphorbietum dendroidis* Géhu, Costa & Uslu 1988	Géhu *et al.*,1988, Tab. 1, rels. 3-4 (Turkey –Kas region); Biondi & Gehu (1987) Tab. 1, rels.1-3 (Greece – Monastiraki); Akman *et al.,* 1978, Tab. 1, rels. 3-6 (Turkey; Feke village, Adana).
12) *Junipero foetidissimae-Oleetum sylvestris* ass. nova *hoc loco*	Arkman *et al.,* 1978, Tab. pag. 24, rels. 1-2 (Turkey – Köprülü Canyon at North of Beskonak)

13) *Querco aucheri-Oleetum* Vural, Duman, Güner, Dönmez & Şağban 1995	Vural *et al.* (1995, Tab. 5). Tukey (Muğla province at Köyceğiz-Dalyan).
14) *Dorystaecho hastatae-Oleetum oleastri* Kurt, Ketenoğlu, Akman, Özdeniz, Şekerciler, Bölükbaşı & Özbey 2015	Kurt *et al.* (2015, Tab. 1). Turkey (Coastal zone of Antalya Gulf).
15) *Spiraeo crenatae-Oleetum sylvestris* Karaer, Kilinc, Korkmaz, Guray Kutbay, Yalcin & Bilgin, 2010	Karaer *et al.* (2010, Tab. 4) – Turkey (Kizilirmak valley between Asagisusuz-Ardiçtepe region and Kepez gorge); Korkmaz *et al.* (2011, Tab. 3) – Turkey (Ardıçtepe districts).
QUERCETALIA ILICIS Br.-Bl. ex Molinier 1934	
Querco rotundifoliae-Oleion sylvestris Barbéro, Quézel & Rivas-Martínez in Rivas-Martínez, Costa & Izco 1986	
16) *Viburno tini-Oleastretum* J.C. Costa, Capelo & Lousa 1994	Costa *et al.,* 1994 (Tab.1, rels. 1-14) – Portugal (Serra da Arrábida).
16.1) subass. *typicum*	
16.2) *fraxinetosum angustifoliae* Costa, Capelo & Lousa 1994	Costa *et al.,* 1994 (Tab. 1, rels. 15-24). (2009, Synthetic table) – Portugal (Olissiponense, Sadense and Arribadense districts).
16.3) *ephedretosum fragilis* Neto, Arsénio, & Costa 2009	Neto *et al.,* 2009 (Synthetic table) – Portugal (Costeiro Vicentino districts).
17) *Aro neglecti-Oleetum sylvestris* Rivas-Martínez & Cantò 2002 corr. Rivas-Martínez & Cantò	Rivas-Martínez *et al.* (2002, p. 39) – Spain (Cádiz – from Medina Sidonia to Cantora hill) sub *Aro italici-Oleetum sylvestris* Rivas-Martínez & Cantò 2002.
17.1) subass. *typicum*	Galán De Mera *et al.*, 2000 Gibilterra (Tab. 1, rels. n. 17 and 69) – Gibilterra (sub *Tamo communis-Oleetum sylvestris* Benabid ex Pérez Latorre, Galán de Mera, Deil & Cabezudo 1996).
17.2) *fraxinetosum angustifoliae* Pérez Latorre, Galán de Mera, Deil & Cabezudo ex subass. nova *hoc loco*	Galan De Mera *et al.*, 2000 (Tab. 1, rels. 18, 22, 23, 6, 64, 70, 74) – Gibilterra (sub *Tamo communis-Oleetum sylvestris* Benabid ex Pérez Latorre, Galán de Mera, Deil & Cabezudo 1996).
18) *Rhamno laderoi-Oleetum sylvestris* (Cantò, Ladero, Perez-Chiscano & Rivas-Martínez 2011) nom. nov. prop.	Rivas-Martínez *et al.* (2011, Tab. 75.3.15) – Spain (Sierra de San Vicente and Alberche valley) sub *Asparago albi-Oleetum sylvestris* Cantó, Ladero, Pérez Chiscano & Rivas-Martínez 2011.
Fraxino orni-Quercion ilicis Biondi, Casavecchia & Gigante ex Biondi, Casavecchia & Gigante in Biondi, Allegrezza, Casavecchia, Galdenzi, Gigante & Pesaresi 2013	
19) *Cyclamino repandi-Oleetum sylvestris* Bacchetta, Bagella, Biondi, Farris, Filigheddu & Mossa 2003	Bacchetta *et al.* (2003, Tab.1) – Sardinia (Cagliari province at Sarroch, Capoterra and Villa San Pietro).
Erico arboreae-Quercion ilicis Brullo, Di Martino & Marcenò 1977	
20) *Myrto communis-Oleetum sylvestris* Bacchetta, Bagella, Biondi, Farris, Filigheddu & Mossa 2003	Bacchetta *et al.* (2003, Tab. 2) – Sardinia (Sassari province at Caprera, and La Maddalena); Paradis *et al.* (2014, Tab. 12) – SW-Corsica (Monte Barbatu, Sant'Armettu, Burgo).
21) *Calicotomo infestae-Oleetum sylvestris* Gianguzzi & Bazan 2019	Gianguzzi & Bazan (2019, Tab. S6, rel. 112) – Sicily (Trapani (Bosco Scorace and Bosco di Calatafimi), Palermo Mountains (Monte Mirto, near Partinico), Trabia Mountains, Misilmeri, Madonie (Bosco di Munciarrati, Cefalù, etc.),
21.1) subass. *typicum*	
21.2) *asplenietosum obovatae* Gianguzzi & Bazan 2019	Gianguzzi & Bazan (2019, Tab. S6, rel. 117) – Sicily in the Peloritani Mountains (Pace del Mela, Santa Lucia del Mela, Torrente Mela, Fiumara Mazzarra, etc.).
Arbuto unedonis-Laurion nobilis Rivas-Martínez, Fernández-González & Loidi 1999	
Suball. **Arbuto unedonis-Laurenion nobilis** Rivas-Martínez & Sanche-Mata 2001	
22) *Lithodoro diffusae-Oleetum europaeae* Bueno Sánchez & Fernádez Prieto 1991	Bueno Sánchez & Fernádez Prieto (1991, Tab. 2) – Spain (Asturias at Villaviciosa and Cantabria at Comillas).

Appendix II - Pictures illustrating the described vegetation types

Fig. 1 - a) Wood formation dominated by *Olea europaea* var. *sylvestris* of the association *Prasio majoris-Oleetum sylvestris*, association on carbonate outcrops of Menorca Island (Balearic Islands, Spain); b) detail of *Asparagus stipularis*, characteristic species of the latter coenosis; c-d) *Asparagus albus*, typical element of the the *Asparago albi-Oleetum sylvestris*, a xerophilous formation widespread along the coastal and sub-coastal belts of Sardinia (Italy); e) aspect of the *Hippocrepido emeroidis-Oleetum sylvestris* near Porto Palermo (Albania), along the Southern coast of Albania; f) *Ephedra foeminea* and *Euphorbia dendroides* typical elements of the latter association, spread along the Adriatic coasts of the Balkan Peninsula with isolated presences also in Italy.

Fig. 2 - a) Mount Pellegrino near Palermo (Sicily, Italy): aspects of the *Ruto chalepensis-Oleetum sylvestris*, basiphilous formation typical of limestone substrates of North-Western Sicily; b) *Rhamnus lycioides* subsp. *oleoides*, characteristic species of the subass. *rhamnetosum oleoidis*, growing in Western-Sicily and Aegadian Islands; c) and *Periploca angustifolia*, differential element of the subass. *periplocetosum*, located in the small islands of the Sicily Channel; d) microwood of the *Calicotomo infestae-Oleetum sylvestris* (Palermo province), association widespread on coastal arenaceous outcrops of the Tyrrhenian sector of Sicily; e) the same association on metamorphic substrates of the Peloritani Mountains, near Tripi; f) *Asplenium obovatum* typic element of the subassociation *asplenietosum obovatae*.