Fitosociologia 41 (1): 87-164, 2004

Syntaxonomical revision of *Quercetalia pubescenti-petraeae* in the Italian Peninsula

Blasi C.[1], Di Pietro R.[1] & Filesi L.[2]
[1]*Dipartimento di Biologia vegetale Università "La Sapienza" di Roma, P.le Aldo Moro 5, I-00185 Roma; e-mail: carlo.blasi@uniroma1.it*
[2]*Dipartimento di Pianificazione, Università IUAV di Venezia, Cà Tron, Santa Croce 1957, I-30135 Venezia*

Abstract
This paper presents a new sintaxonomical scheme for *Quercetalia pubescenti-petraeae* woodlands in peninsular Italy updated at the rank of sub-alliance. On the basis of bioclimatic, biogeographic and coenological diagnosis the *Quercetalia pubescenti-petraeae* order occurs in the study area in the form of five alliances: *Quercion pubescenti-petraeae* (suball.: *Buxo-Quercenion pubescentis*), *Carpinion orientalis* (suball.: *Campanulo-Ostryenion, Laburno-Ostryenion* stat. nov.; *Lauro-Quercenion pubescentis* and *Cytiso-Quercenion pubescentis*), *Teucrio siculi-Quercion cerridis* nom. conserv. propos. (suball.: *Teucrio-Quercenion cerridis* suball. nov., *Ptilostemo-Quercenion cerridis*); *Pino-Quercion congestae* (suball.: *Pino-Quercenion congestae* suball. nov., *Quercenion virgilianae* suball. nov.) and *Erythronio-Quercion petraeae*. The *Quercion pubescenti-petraeae* is a sintaxon with a sub-continental character and within the Italian Peninsula it is restricted to Ligurian-Piedmontese Apennine in the form of the sub-alliance *Buxo-Quercenion pubescentis*. *Carpinion orientalis* is a sintaxon with oceanic/suboceanic features, which is widely distributed along the entire Italian Peninsula. It occurs mainly on limestone substrates forming woodlands which can be potential vegetation types and also woods of secondary origin and evolution. The *Teucrio-Quercion cerridis* is an alliance which is widely distributed within central and southern Italy, where it finds its coenological optimum on acid, subacid or neutral substrates such as volcanic outcrops, flysch, sandstones or clayey-arenaceous sediments. In this alliance are included both thermophilous *Quercus cerris* and *Quercus petraea* woodlands of Tuscany, Umbria and northern Latium, together with *Quercus cerris* and *Quercus frainetto* woodlands of southern Italy. The alliance *Pino-Quercion congestae* is restricted to Sicily and southern Calabria, and includes *Quercus virgiliana* and *Q. dalechampii* hilly woodlands, and also sub-montane and lower-montane *Quercus congesta* woods. Finally, *Erythronio-Quercion petraeae* behaves as a typical mesophilous and microthermic alliance which exhibits clear biogeographical similarities with towards the central-european woodlands. This alliance is restricted to the northern Apennines where it is in geo-serial contact with *Carpinion betuli*, *Quercion robori-petraeae* and *Fagion* woodlands.

Key words: Biogeography, ICPN, peninsular Italy, Phytosociology, Synchorology, Syntaxonomy, woodlands.

Riassunto
Nel presente lavoro viene fornita la revisione sintassonomica dell'ordine *Quercetalia pubescenti-petraeae* nella penisola italiana aggiornato al rango di alleanza e suballeanza. Sulla base di valutazioni di carattere bioclimatico, biogeografico, sinecologico, sintassonomico e nomenclaturale, si ritiene che nella penisola Italiana facciano riferimento all'ordine *Quercetalia pubescenti-petraeae* le seguenti alleanze: *Quercion pubescenti-petraeae* (suball.: *Buxo-Quercenion pubescentis*), *Carpinion orientalis* (suball.: *Campanulo-Ostryenion, Laburno-Ostryenion* stat. nov.; *Lauro-Quercenion pubescentis* e *Cytiso-Quercenion pubescentis*), *Teucrio siculi-Quercion cerridis* nom. conserv. propos. (suball.: *Teucrio-Quercenion cerridis* suball. nov., *Ptilostemo-Quercenion cerridis*); *Pino-Quercion congestae* (suball.: *Pino-Quercenion congestae* suball. nov., *Quercenion virgilianae* suball. nov.) ed *Erythronio-Quercion petraeae*. Il *Quercion pubescenti-petraeae* ha carattere essenzialmente continentale e nella penisola italiana s.s. è riconosciuto solo per l'Appennino Ligure-Piemontese relativamente alle cenosi appartenenti alla suballeanza *Buxo-Quercenion pubescentis*. Il *Carpinion orientalis* è ampiamente diffuso in tutta la penisola e si presenta come alleanza a carattere suboceanico prevalentemente diffusa su substrati di tipo carbonatico alla quale afferiscono sia comunità forestali climatofile sia boschi o boscaglie di origine secondaria. Il *Teucrio-Quercion cerridis* interessa tutto il settore centro-meridionale della penisola, dove trova il proprio optimum sinecologico sui substrati acidi o subacidi di tipo vulcanico, sul flysch, sulle arenarie compatte o sui complessi pelitico-arenacei. All'alleanza *Pino-Quercion congestae* afferiscono i boschi a *Quercus virgiliana* e *Q. dalechampii* del piano collinare ed i boschi a *Quercus congesta* dell'orizzonte submontano e montano inferiore della Sicilia e dell'estremità meridionale della Calabria. L'*Erythronio-Quercion petraeae* infine, è l'alleanza che più delle altre mostra affinità con i boschi misti subacidofili e mesofili centro e sudest-europei a dominanza di *Quercus petraea*.

Parole chiave:Biogeografia, boschi, Fitosociologia, ICPN, penisola Italiana, Sincorologia, Sintassonomia.

Introduction

Over the past thirty years, various studies aimed at defining a sintaxonomical scheme for termophilous deciduous woodlands of the Italian Peninsula have been published. Nevertheless, most of the problematic issues which have arisen through these years are still being debated today. There are basically two main factor which make it difficult to drow up an unequivocal syntaxonomical scheme for Italy, and they act at two different levels. On the one hand, there is the considerable orographic and bioclimatic complexity of Italy. The Peninsula, in fact, is characterized by a highly diversified litostratigraphy in which volcanic substrates, limestones, marls, sandstones, and flysch are often found in close proximity to each other within a very restricted area. On the other hand there is a range of factors linked to millenia of human activity, which has tended to

impinge upon precisely that belt which normally would be occupied by mixed oak forests. From a syntaxonomical standpoint, the lithological and physiographical complexity is related to high rank sintaxa (from the class to the alliance). The respective geographical position of the Apennine and Balkan mountain chains, and their similar paleoclimatical and paleobotanical histories helped conserve in these two systems the greater part of the forest flora of the European continent during the cold periods of the Quaternary (Božilova, 1975; Pons, 1984; Bennet *et al.*, 1991 Tzedakis, 1993; Follieri & Magri, 1994; 1998; Blasi *et al.*, 1995; Magri, 1999). This also led to marked coenological and biogeographical interrelationships becoming established between these two sectors of southern Europe, giving rise to an autonomous biogeographical Province (Rivas-Martínez, 2001). At the same time, especially as regards the Apennines, the links with the biogeographical district of central Europe are not to be underestimated. Furthermore, the location of the Italian Peninsula in the centre of the Mediterranean basin, the short distance separating the Tyrrhenian and the Adriatic Seas and the termophilous penetration afforded by the river systems, led to a significant presence of evergreen Mediterranean flora. It is not accidental that in the most termo-xerophilous areas of the Apennines and in Sicily, typical geo-serial contact between sclerophyllous broad-leaved woodlands and beech is found, and often *Pistacio-Rhamnetalia* shrubland communities are involved in the syndynamics of the termophilous deciduous woods.

The first studies on the syntaxonomy of southeastern-European deciduous oak woodlands were undertaken within the Mediterranean sector of France (Braun-Blanquet *et al.*, 1951) and still more within the Balkans and Italian and Slovenian Karst territory (Beck-Managetta, 1901; Adamovic, 1906; 1929; Horvatić, 1939; Rikli, 1943; Oberdorfer 1948; Horvat, 1950; 1956; Horvatić, 1957; Horvat, 1958; 1959; Wraber, 1960; Jakucs, 1960; 1961; Gracanin, 1962; Horvatić, 1963; Lausi, 1964; Lausi & Poldini, 1962; 1966; Blečič & Lakušič, 1967; Wraber, 1967). At times syntaxonomical interpretations established for the Balkans were applied more or less arbitrarily to the Italian Peninsula. Another line of thougth (Oberdorfer & Hofmann, 1967; Oberdorfer, 1968), tended to consider the Apennines ad an extension southwards of the Alpine chain, and consequently the sinsystematic scheme drew upon the range of syntaxa commonly used for central-European vegetation.

The first phytosociological studies on the forest vegetation of the Appenines were those carried out by Barbero & Bono (1968); Gruber (1968), Barbero & Loisel (1969), Barbero & Bonin (1969), Barbero *et al.* (1971) on the Marittime and Ligurian Alps; Pignatti (1967), Barbero & Bono (1970) Bono *et al.* (1970), Alessandrini & Corbetta (1979) on northern Apennines, and the Apuan Alps; by Ubaldi (1971; 1974); Pedrotti *et al.* (1979a; 1979b), on the Marches Apennines, Arrigoni (1974); De Dominicis & Casini (1979) for southern Tuscany; Montelucci, (1972; 1978) for Latium; Caputo, 1968; Corbetta, 1974; Aita *et al.* (1974; 1977), Avena & Bruno, 1975; Bonin & Gamisans (1976); Bonin *et al*., 1976 and Bonin, 1978 on the southern Apennines, Gentile, 1968; Poli, 1979; Ronsisvalle & Signorello, 1979; Ferro *et al.*, 1980; Di Benedetto, 1981 for Sicily; Gamisans (1977) for Corsica. During the 1980's increasing numbers of studies of a local nature were undertaken and these provided the first details regarding the higher syntaxonomical level (Avena *et al.*, 1980; Bonin, 1980; Ubaldi, 1980; Abbate *et al.*, 1981; 1990; Ballelli *et al.*, 1982; Biondi, 1982; Blasi *et al.*, 1982; Pignatti, 1982; Ubaldi & Speranza, 1982; Brullo, 1983; Ubaldi *et al.*, 1984; Blasi, 1985; Ubaldi & Speranza, 1985; Ubaldi *et al.*, 1984; 1986; Biondi, 1986; Mondino, 1989; Lucchese & Pignatti, 1990; Blasi *et al.*, 1990; Francalancia, 1990; Pignatti & Pignatti, 1990; Scoppola *et al.*, 1990).

From the end of the 1980's to today, a range of proposals have been put forward for revisions to the syntaxonomy of the deciduous woods of the Apennines or just for a minor part of it (Arrigoni & Foggi, 1988; Poldini, 1988; Ubaldi, 1988; Biondi, 1989; Poldini, 1989; Arrigoni *et al.*, 1990; Ozenda, 1990; Ubaldi *et al.*, 1990; Ubaldi & Zanotti, 1994; Scoppola *et al.*, 1995; Ubaldi, 1995; Ubaldi *et al.*, 1995; Arrigoni, 1997; 1998; Scoppola & Filesi 1998; Brullo *et al.*, 1999; Pignatti, 1998; Poldini, 1998; Brullo *et al.*, 2001, Blasi *et al*., 2002; Ubaldi, 2003). These proposals have differed widely from each other both in respect of their nomenclatural schemes and the numbers of alliances and orders referred to.

The aim of the present paper is to provide a syntaxonomical scheme for the deciduous woods of peninsular Italy and Sicily at the hierarchical rank of sub-alliance, together with appropriate nomenclatural references. Eventual syntaxonomical synonymy at the association and subassociation levels is not discussed, as this is to be the subject of a further paper currently being prepared.

Remarks on syntaxonomical ranks above the level of alliance

Within the forest vegetation of southern Europe the numbers of proposed alliances and their relative synecological and syncorological range, is highly variable. This variability is primarily the result of the high-rank syntaxonomical position assigned to xerothermic woods dominated by *Quercus pubescens*. Some authors (Jakucs, 1961, Quézel *et al.*, 1980; Ivan *et al.*, 1993; Theurillat *et al.*, 1995; Dimopoulos & Georgadis, 1995; Chytrý, 1997; Mucina, 1997) include *Quercus pubescens* oak woods and the xerothermic woods of south-eastern Europe in the class *Quercetea pubescentis*. Other authors, instead, advance the hypothesis of a single class, *Querco-Fagetea*, within which the floristic-coenological differences among oak woods, mixed woods and beech woods are expressed at the level of order or alliance (Horvat *et al.*, 1974; Oberdorfer, 1992, Wallnöfer *et al.*, 1993; Scoppola *et al.*, 1995; Rivas-Martínez *et al.*, 2001; 2002).

Jakucs' proposal of 1961 concerning the class *Quercetea pubescenti-petreae* identified two orders, one of which was of a mid-european-continental nature (*Quercetalia petraeae-pubescentis*), while the other was simply sub-Mediterranean (*Orno-Cotinetalia*), focussed on the Balkan Peninsula but extending overall from eastern Spain to Caucasus.

In a study on the vegetation of northern Anatolia, Quézel *et al* (1980; 1992) proposed their new order *Querco-Carpinetalia orientalis* which, within *Quercetea pubescentis*, formed the south-eastern vicariant order *Quercetalia pubescentis sensu* Braun Blanquet, which was considered as belonging to south-western Europe. As differential species for this order (whose presence in Italy too was thought likely) the authors proposed *Quercus cerris, Q. frainetto, Ostrya carpinifolia, Fraxinus ornus, Carpinus orientalis* and *Acer obtusatum.* The class *Querco-Fagetea*, instead, was restricted to forests dominated by *Fagus orientalis*, or *Carpinus betulus* and to coniferous woods of *Picea orientalis, Abies bournmulleriana* and *Abies normanniana*.

The presence of the class *Quercetea pubescentis* was also recognised for the Iberian Peninsula (Rivas-Martínez, 1972), even if currently (Rivas-Martínez *et al.*, 2001) it has once again been brought back within *Querco-Fagetea*. Theurillat *et al.* (1995), within a syntaxonamical scheme applying to the whole of the Alpine range, keep the reference for hilly termophilous woods to the class *Quercetea pubescentis* with just a single order (*Quercetalia pubescenti-petreae*) and two alliances (*Quercion pubescenti-petraeae* and *Carpinion orientalis*).

On the basis of the data available to us, the proposal that the classes *Quercetea pubescentis* e *Querco-Fagetea* exist in Italy does not seem tenable. As already emphasised in Scoppola *et al.* (1995), oak woods, mixed woods and termophilous beech woods in Italy have characters in common, from floristic, synecological and syncorological points of view. The hop hornbeam communities of *Carpinion orientalis* of central Italy, for example, (*Melittio-Ostryetum, Scutellario-Ostryetum, Euphorbio-Ostryetum*), as well as being characterised by eastern taxa such as *Ostrya carpinifolia, Fraxinus ornus, Acer obtusatum, Sesleria autumnalis,* also contain a rich group of species of *Fagetalia* or *Querco-Fagetea* (*Viola reichembachiana, Euphorbia amygdaloides, Mycelis muralis, Scilla bifolia, Melica uniflora, Sanicula europaea, Polygonatum multiflorum, Crataegus laevigata, Lilium martagon, Fragaria vesca, Melittis melissophyllum, Galanthus nivalis, Ornithogalum pyrenaicum*… together with sub-Mediterranean or sub-Atlantic species such as *Ilex aquifolium, Daphne laureola, Hedera helix, Rosa arvensis, Brachypodium rupestre* etc). The same mixture is also evident in the Turkey oak and Downy oak woods of Tuscany and northern Latium (*Cephalanthero-Quercetum cerridis, Mespilo-Quercetum cerridis*) in the oak woods of Umbria and the Marches (*Dactylorhizo-Quercetum petraeae*) and, indeed, also in the Turkey oak and Italian (Hungarian) oak woods of central-southern Italy (*Mespilo-Quercetum frainetto, Echinopo siculi-Quercetum frainetto*).

Thus, despite the clear epiontological links that exist between the Italian Peninsula and the south-eastern European biogeographical district, the Apennine chain stretching from the Alps to Sicily, together with a sub-oceanic bioclimate, mean that strong links are maintained with forest vegetation of central Europe and that there is just one single syntaxonomical class, identifiable as *Querco-Fagetea.*

The present study also excludes the possibilty that endemic syntaxa at the level of order are present in the Apennines (*Carpino-Melicetalia, Lathyro veneti-Carpinetalia, Lathyro nigri-Quercetalia cerris*) as was proposed at the end of the 1980's for the mesophilous deciduous woods with sub-Mediterranean features (cfr. Ubaldi *et al.*, 1986; Ubaldi, 1988; Ubaldi *et al.*, 1990). In fact, as other studies have shown (Scoppola *et al.*, 1995; Pignatti, 1998), in peninsular Italy there are no

floristic and vegetational environments which are autonomous with respect to the rest of Europe, such as might make it plausible that an Apennine woodland order exists. Nevertheless, the idea that there may be an order interposed between *Quercetalia pubescenti-petraeae*[1] and *Fagetalia sylvaticae*, named *Querco-Fagetalia*, to which would be assigned termophilous mixed oak woods and mesophilous beech woods, was proposed yet again in a recent revision (Ubaldi, 2003). Within this order two new suborders are proposed, while the *Quercetalia pubescenti-petraeae* (described in Ubaldi, 2003 as *Quercetalia humili-petraeae*[2]) provides for no less than three orders, named respectively *Vincetoxico-Quercenalia humilis* (mixed neutro-basiphilous oak woods), *Lathyro nigri-Quercenalia cerridis* (sub-acidophilous oak and chestnut woods) and *Lathyro veneti-Carpinenalia* (oak and hop hornbeam sub-oceanic woods). The order *Querco-Fagetalia*, although it can clearly be overlapped with *Fagetalia sylvaticae*, displays a high level of cenological heterogeneity at its extremes. This allows some sub-Mediterranean termophilous oak woods which are rich in *Quercetea ilicis* species to be included within it as well. These orders, therefore, should be dissambled and then reassigned among the various alliances which are already known for *Fagetalia*, and, in part, among some alliances of *Quercetalia pubescenti-petraeae*. Similarly, as regards the sub-orders of *Quercetalia humili-petraeae*, floristic, coenological and synchorological differences are not sufficiently evident to warrant a separation at such a high syntaxonomical level. It is any case clear that the environmental variability (lithological, edapho-morphological, and bioclimatic) found in the Italian Peninsula, together with its geographical position, lead to high levels of floristic and vegetational complexity. Although this vegetational complexity appears to be peculiar in a European context and it can still be represented through lower rank syntaxa such as alliance, sub-alliance and association.

Study area

The study area (Fig. 1) covers the entire Apennine chain, from the Liguria-Piedmont Appenines to Pollino and, further south, the Sila and the Calabrian-Peloritano range and the main mountainous parts of Sicily. The woods of Sardinia were not considered in the present study because their floristic-vegetational peculiarities derive from a paleogeographic and paleobotanic history which is completely different from that of peninsular Italy.

In lithological terms the Italian Peninsula is extremely diversified, ranging across: limestone platforms which form the main backbone of the central-southern Apennines (Gran Sasso, Velino, Majella, Simbruini-Ernici, Volsci, Matese, Sirino-Papa, Pollino, Gargano, Murge and Serre Salentine); marls distributed in a discontinuous manner, more or less throughout the Peninsula; volcanic deposits occuring mainly in the Tyrrhenian sectors of Tuscany, Latium, and Campania (Amiata, Monti Cimini, Sabatini, Colli Albani, Roccamonfina, Vesuvio etc.) but also further south (Vulture, Etna etc.); torbiditic deposits which make up the greater part of the northern Apennines, but which are also found in the central (Laga mountains) and southern Apennines (Molisan flysch, Lucanian Dolomites etc.); crystalline rocks of Alpine origin (Aspromomte); Quaternary deposits of various origins (Roman Countryside, Quaternary ancient paleo-dune of Circeo National Park etc.).

In bioclimatic terms (Fig. 2), the study area falls partly

[1] According to Moravec (in, Béguin & Theurillat 1984), Braun-Blanquet (1931) published the order *Quercetalia pubescentis* invalidly because the single alliance cited in the original paper as belonging to the order was invalidly published too. In a further paper (Braun-Blanquet, 1932) in which alliance *Quercion pubescenti-sessiliflorae* is validly published, the name of the order is never quoted (although the phytosociological tables reported "species characteristic of the order"). As a consequence still in Braun-Blanquet, 1932 the name *Quercetalia pubescentis* cannot be considered as validly published. Klika (1933) published the order *Quercetalia* without any specific ephitet but making a clear and unequivocal reference to *Quercion pubescenti-sessiliflorae* Br.-Bl. 1932. As a consequence *Quercetalia* Klika 1933 is a validly published name. Because the name proposed by Klika had to be completed Moravec (in Béguin et Theurillat,1984) proposed to use both the species forming the name of the alliance upon which the same order is based (*Quercetalia pubescenti-sessiliflorae*). So, the complete name of the order should be *Quercetalia pubescenti-sessiliflorae* Klika 33 corr. Chytrý, (1997) proposed the name *Quercetalia pubescenti-petraeae* as *nomen mutatum* since the name *Quercus sessiliflora* is no longer used in current taxonomical literature. Nevertheless many recent large areas syntaxonomical revisions (Wallnöfer *et al*., 1993; Rivas-Martínez *et al*., 2001) tend to use the simpler form *Quercetalia pubescentis* Klika 1933.

[2] In strictly nomenclatural terms the use of the name- *Quercetalia humili-petraeae* as a substitute for *Quercetalia pubescenti-petraeae* as proposed in Ubaldi (2003) can not be accepted (Art. 45). Besides the issues surrounding the taxonomy of *Quercus pubescens* Willd. and *Quercus humilis* Mill are still today the subject of considerable debate (cfr. Amaral Franco & Lopez Gonzales, 1987; Rivas-Martínez & Saenz Lain, 1991; Govaerts, 1995; Brullo *et al.*, 1999; Rivas-Martínez *et al.*, 2002).

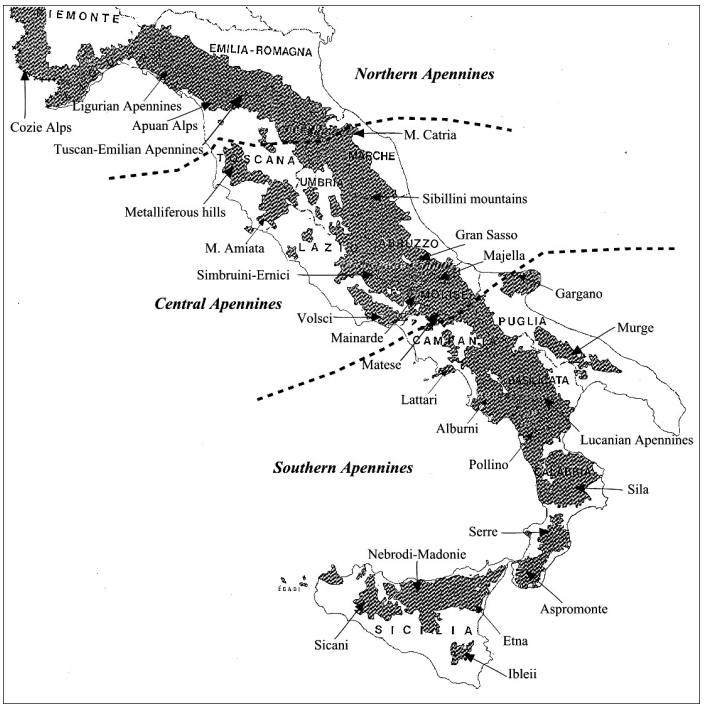


Fig. 1 - Physiographic map of the study area with the main mountainous chain evidenced

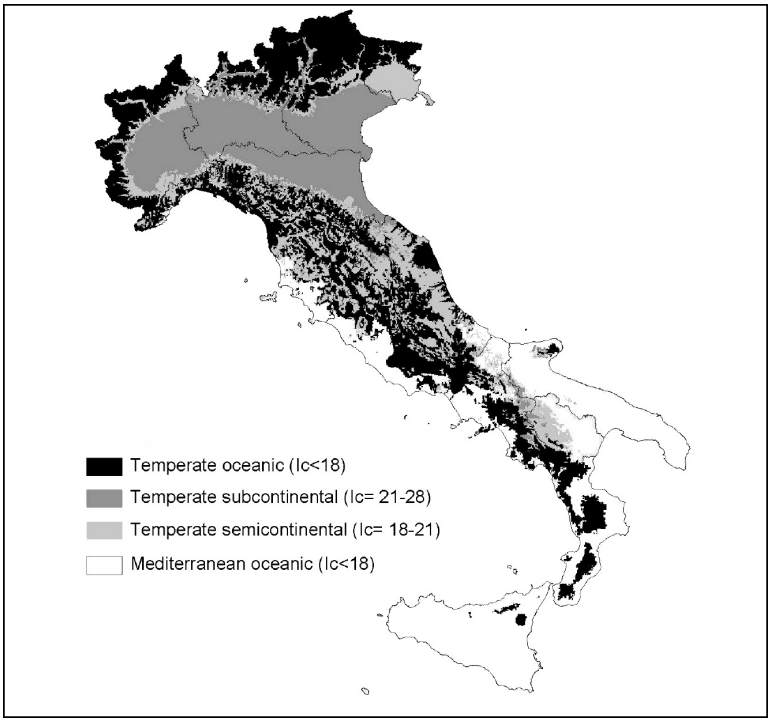


Fig. 2 - Bioclimatic features of the Italian Peninsula (after Blasi & Michetti, 2002). Mediterranean and Temperate transitional regions are those in which umbro-thermic stations are sited which record Io_2 (Trans. Temp.) and Io_3 (Trans Medit.) > 2 (indexes values follows Rivas-Martínez, 1987; 1995)

within the Temperate region, partly within the Mediterranean region and partly within a wide area of transition (Blasi, 1994; Rivas-Martínez, Penas *et al.*, 2001; Blasi & Michetti, 2002). In the northern Apennines almost all the *Quercetalia pubescenti-petraeae* woods fall within the Temperate region, with thermotypes ranging from hilly to submontane and ombrotypes ranging from lower subhumid to upper humid. In the central part of the Peninsula the Mediterranean bioclimatic region is more in evidence and not only do the coastal plains fall within this, but also the first spurs of the sub-Apennines. Thermotypes here range from meso-Mediterranean to lower mountain, while umbrotypes range from higher sub-humid to lower hyper-humid. Lastly, in the southern Apennines the Mediterranean bioclimate reaches a maximum and the Temperate region becomes confined to the most central and highest parts of the Apennine chain.

Data and methods

Published phytosociological relevés executed in accordance with the Braun-Blanquet method (Braun-Blanquet, 1964) and regarding oak *sp.pl.* and mixed woodland community types occurring in peninsular Italy were taken into consideration. Since the original papers from which the relevés were selected span a period of more than thirty years, they were carefully checked in order ensure an acceptable degree of similarity in terms of sampling methodology was maintained. When specified for different strata in the original data, abundance values were recalculated to one single all-inclusive value for each species in each relevé. Because several relevés showed some floristic identification errors, a nomenclature and taxonomic updating was performed[3]. For species nomenclature, life forms and chorology, reference was made to Meusel *et al.* (1965); Jalas & Suominen (1972-1994); Jalas *et al.* (1996) and Pignatti (1982). As regards species whose

taxonomic rank is still uncertain, Tutin *et al.* (1964-1980; 1993), Greuter *et al.* (1984-1989), Conti (1998) and Anzalone (1994; 1998) were also consulted. Chorological spectra (Fig. 11) were calculated on the basis of the frequency of the single species (chorotypes) in the synoptic columns. A first matrix made up of a total of 420 relevés and 890 species and subspecies was analysed. In order to assess the vegetational similarity among the available material, and the degree of heterogeneity shown by each individual association, a pilot analysis based on a binary matrix composed of selected relevés was performed. In constructing this matrix the selection and the number of relevés taken from the original tables was based on various criteria, such as the author's diagnosis, the size and heterogeneity of the table, the presence of sub-associations or variants. As regards associations which turned out to have already been codified, the type-relevé and the relevés which exhibited most similarity to this type-relevé were chosen. Next a synoptic table composed of the frequency columns of all the associations described within the Italian Peninsula was prepared and subsequently subjected to multivariate analysis [4]. For the cluster analysis (Fig. 3) the matrix was treated with multivariate analysis procedures using the chord distance algorithm to produce the dissimilarity matrix and the average linkage as agglomeration criterion (package Syntax 5.2 program, Podani, 1993; 1994). For the ordination, a non-metric multidimensional scaling was performed, showing also the superimposed partition at the hierarchical level of alliance (Fig. 4). In the final step, three PCA ordinations with corrisponding biplots were performed for the individual matrix of the alliances which were composed of more than one suballiance (Fig. 5, 7, 9). In the final synoptic tables the diagnostic species of the single suballiances and alliances were identified as "characteristic", "transgressive" and "differential" according to Braun-Blanquet & Pavillard (1922), Géhu & Rivas-Martínez (1981), Mucina (1993). It is worthnoting, however, that those species which have been considered as transgressive (t) or differential (d) for a given alliance or suballiance, assume effectively this role only in a *Quercetalia pubescenti-petraeae* context.

Results

Multivariate Analysis

The dendrogram (Fig. 3) shows different levels of clustering. The first division separates cluster 1, which is composed of the woodland types found in Sicily (with the addition of the *Erico-Quercetum congestae* of Aspromonte) and which corresponds in its entirety to the alliance *Pino-Quercion congestae*, from cluster 2, which is characterized by all the other woodland community types occurring in the Italian Peninsula (the single isolated line on the right of the dendogram corresponds to *Querco-Betuletum*, a highly peculiar relict association which is developed on completely different substrates from those of the other community types and which is consequently characterised by species, such as *Betula pendula*, which do not occur in any of the other phytosociological tables). The other divisions concern only cluster 2, which has been further divided into ten sub-clusters corresponding to the other four alliances, and, as regards *Teucrio-Quercion cerridis* and *Carpinion orientalis*, to their various sub-alliances. Although each individual syntaxon appears to be clearly

[3] Among the many taxonomical problems which have arisen repeatedly over the years, is that most authors have not given recognition to species belonging to genera which are notoriously critical (*Rosa* sp., *Rubus* sp. *Polypodium* sp., *Lonicera* sp., *Hieracium* sp., *Hieracium* gr. *murorum*; *Festuca* sp., *Cephalanthera* sp.; *Epipactis* sp; ecc.). In other cases the uncertainty was limited to just two species. (*Digitalis lutea* + *micrantha*; *Viola reichembachiana* + *riviniana*, *Platanthera bifolia* + *clorantha;* ecc.). Among the erroneous, or uncertain interpretations regarding species of the same genus which exhibit at least partial chorological and ecological overlapping, and which can assume a signficant syntaxonomical role in peninsular *Quercetalia pubescenti-petraeae* woodlands, are the following: *Aristolochia pallida/A. lutea* (Nardi, 1984); *Pulmonaria vallarsae / P. saccharata / P. apennina* (Puppi & Cristofolini, 1996), *Sesleria autumnalis / S. argentea*; *Digitalis lutea / micrantha*; *Acer opulifolium / obtusatum* (cfr. Murray, 1971; Van Gelderen *et al.*, 1994;); *Coronilla emerus / C. emeroides*; *Melittis melissophyllum / M. albida*; *Teucrium siculum / T. scorodonia*; *Brachypodium rupestre / B. pinnatum* (cfr. Lucchese, 1990); *Luzula sylvatica / L. sieberi / L. sicula*; *Laburnum anagyroides / L. alpinum*; *Polypodium vulgare/ P. interjectum* (Nardi & Tomei, 1976). *Dryopteris villarii* (Bellardi) Woyn ex Thell. / *Dryopteris pallida* (Bory) Chr. ex Maire & Petitm (Nardi, 1976). *Melampyrum italicum / M. velebiticum*; *Helleborus bocconei* subsp. *bocconei* / *H. bocconei* subsp. *siculus*. To these taxonomical problems are to be added, obviously, the problems concerning the genus *Quercus* - about which more will be said below.

[4] All the associations described as new in Pignatti (1998) are to be considered invalid (Art. 5). These associations could not be validated since no phytosociological tables were available for providing a type-relevé. As a consequence both these associations were not included in the statistic analysis. The association proposed as new in Ubaldi (2003) became available to us only when the statistical analysis of the woodland matrices was finished and the text was nearing its final form. For this reason these associations too, were not included in the statistic analysis.

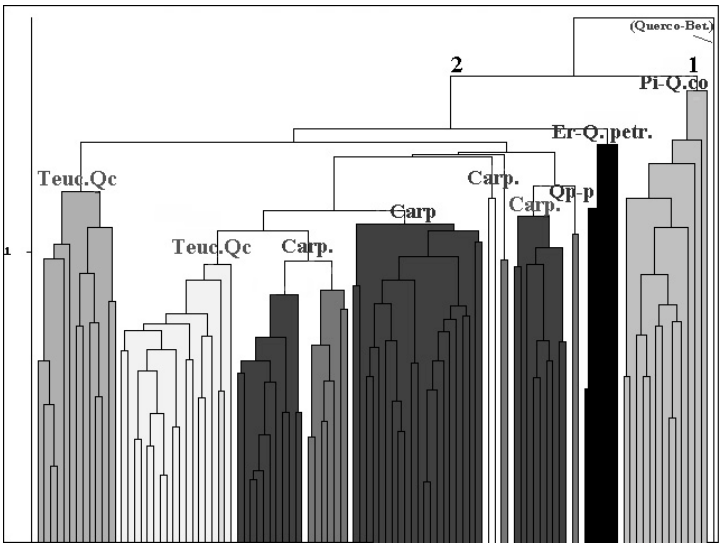


Fig. 3 - Dendrogram of the *Quercetalia pubescenti-petraeae* woodland alliances, based on the associations described and published for peninsular Italy to date (Teu-Qc = *Teucrio-Quercion cerridis*; Carp = *Carpinion orientalis*; Qp-p = *Quercion pubescenti-petraeae*; Er-Q.petr. = *Erythronio-Quercion petraeae*; Pi-Q.co = *Pino-Quercion congestae*)

identifiable in the dendrogram, it is not possible (and neither is it correct, from a statistical standpoint) to associate to the dendrogram a hierarchical syntaxonomical meaning. In fact, the various sub-alliances do not behave as part of a higher cluster corresponding to an alliance, but tend to be more or less strictly linked on the basis mainly of their geographical proximity. This is a fairly common occurrence which is mainly due to the "unintentional" geographical differential role played by transgressive companion species. The NMDS with partition superimposed, calculated on the two major axes (Fig. 4), shows overlapping amongst some polygons representing the different alliance types. The distribution of the clusters along the first NMDS axis can be correlated to a "geographical" gradient, moving, right to left, from Sicilian and southern Apennines sintaxa (*Pino-Quercion*) to northern Apennine ones (*Erythronio-Quercion* and *Quercion pubescenti-petraeae*). In between there are those alliances (expecially *Carpinion orientalis*, but also *Teucrio-Quercion*) which although showing their distribution optimum in central Italy are widespread throughout the entire Italian Peninsula.

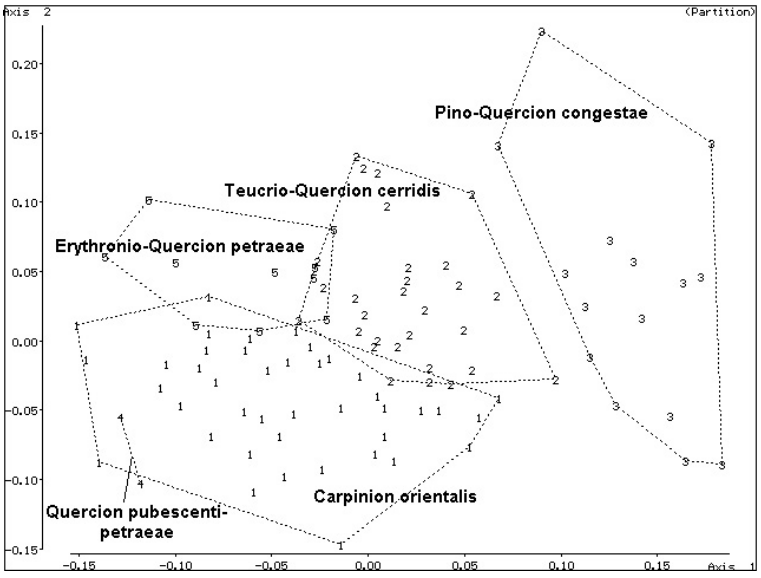


Fig. 4 - Ordination (NMDS) of the *Quercetalia pubescenti-petraeae* woodland alliances, based on the associations described and published for peninsular Italy to date. The superimposed classification is used to show the distribution of the various alliances

General outline of the sintaxonomical results

On the basis of the various clustering levels, the bioclimatic and biogeographic features of the Italian Peninsula and of the role and distribution of the most important diagnostic species, nine major woodland groups were identified. These groups more or less coincide with the hierarchical level of sub-alliance.

The *Quercetalia pubescenti-petraeae* woodlands of the Italian Peninsula and Sicily are to be distributed in five alliances, namely *Quercion pubescenti-petraeae*, *Carpinion orientalis*, *Erythronio-Quercion petraeae*, *Teucrio-Quercion cerridis* (nom. conserv. propos.), and *Pino-Quercion congestae*. Among these alliances, the latter three are to be considered endemic to the Italian Peninsula. *Erythronio-Quercion* and *Pino-Quercion* show a relatively limited distribution area centered, respectively, on the northern Apennines and Sicily-southern Calabria. However *Pino-Quercion congestae* is divided into two suballiances: *Pino-Quercenion congestae* (sub-mountain lower-mauntain, mesophilous and

somewhat acidophilous) and *Quercenion virgilianae* (hylly, thermo-xerophilous and slightly basiphilous). *Teucrio-Quercion cerridis*, instead, which is composed almost exclusively of *Quercus cerris* woodlands, is widespread throughout the entire Italian Peninsula where it can be divided into two sub-alliances, *Teucrio-Quercenion* and *Ptilostemo-Quercenion*, occurring, respectively, in the central and southern Apennines. *Carpinion orientalis* and *Quercion pubescenti-petraeae* have distribution areas which are so wide that they need to be considered on a European scale. Consequently these alliances are to be found across several south-eastern European countries. As far as the Italian Peninsula is concerned, the biogeographical role and the physiognomical impact of these two alliances is quite different. Indeed *Quercion pubescenti-petraeae* (which in the Apennines is identifiable only in the form of the *Buxo-Quercenion* sub-alliance) exhibits a climatophilous role only in the northern Apennines, while the central Apennines few scattered areas related to small pockets of subcontinental bioclimate are still included in *Carpinion orientalis* (*Cytiso-Quercenion pubescentis*). *Carpinion orientalis*, is widely distributed along the entire Italian Peninsula, where it is divided into four sub-alliances, of which the western *Campanulo-Ostryenion* is identifiable on the basis of floristic-phytogeographical factors, while the other three (*Cytiso-Quercenion pubescentis, Laburno-Ostryenion* and *Lauro-Quercenion pubescentis*) are identifiable on the basis of bioclimatical, coenological and syndynamical factors.

ALLIANCE 1: *CARPINION ORIENTALIS* Horvat 1958
Lectotypus hoc loco design.: *Carpinetum orientalis croaticum* Horvatic 1939

DIAGNOSIS: *Carpinion orientalis* woodlands occur in a phytoclimatic context which is between the meso-Mediterranean thermotype and the upper submontane thermotype. However, in central-southern Italy these woodlands can be permanently related to the lower supra-Temperate thermotype. The ombrotypes range from lower subhumid (Tuscany, Sicily, central Abruzzo), to lower hyperhumid (southern and eastern Lazio, Basilicata, Calabria)

CHARACTERISTIC SPECIES: *Carpinus orientalis, Coronilla emerus subsp. emeroides, Ostrya carpinifolia, Acer obtusatum, Peucedanum verticillare, Campanula persicifolia, Cnidium silaifolium, Colutea arborescens, Sesleria autumnalis.*

TRANSGRESSIVE SPECIES AND DIFFERENTIAL SPECIES: *Saxifraga rotundifolia, Viola hirta, Melittis melissophyllum, Acer monspessulanum, Arabis turrita, Staphylea pinnata, Orchis purpurea, Cotinus coggygria, Silene italica subsp. nemoralis, Dianthus monspessulanus, Vicia grandiflora.*

HISTORICAL BACKGROUND*:* The nomenclatural history of *Carpinion orientalis* started in 1954, when Horvat proposed the new alliance named *Carpinion orientalis* located in western areas of the Balkans and the Dynarids (Horvat, 1954; 1958; Horvatic, 1957). According to ICPN, however, the first nomenclaturally valid proposal of *Carpinion orientalis* was made only in Horvat (1958), where three association were included in this alliance. These association were: *Seslerio-Ostryetum*, which was proposed in Horvat & Horvatić (1950), which typically occured on the hill and sub-montane belt in contact with termophilous beech woods, *Carpinetum orientalis croaticum* proposed by Horvatić (1939) as *Querco (lanuginosae)-Carpinetum*, to indicate the woods and underwood dominated by *Carpinus orientalis* and *Quercus pubescens*, with some species of *Quercetea ilicis* and *Carpineto-Cocciferetum* Oberdorfer 1948.

Horvat only proposed the name *Ostryo-Carpinion* in 1959 and as well as having a wider synchorology, it also included several associations within it which differed markedly from each other, both in physognomic and coenological terms. The sinecology of *Ostryo-Carpinion orientalis* coincided, at least in part, with the alliance *Orno-Ostryon* described by Tomažič (1940). Horvat assigned the nucleus of *Orno-Ostryon* (sub-continental termophilous deciduous woods mixed with black pine on alkaline soils) to a new alliance named *Orno-Ericion* included in the proposed new class *Erico-Pinetea* Jakuks (1961), however, disagreed with this arrangement, preferring (as we saw earlier) to consider two classes *Quercetea pubescentis-petraeae* and *Carpino-Fagetea* (*Querco-Fagetea*). The sinecological and sinchorological amplitude of *Ostryo-Carpinion orientalis* was in any case not reduced, in that Jakucs' formulation, too, located the alliance in the western Balkans. Jacuks assigned the whole of the eastern side of the Balkans, as far as Bulgaria and western Romania – which are potentialy assignable to *Ostryo-Carpinion* - to the alliance *Syringo-Carpinion.*

Lakusic *et al.* (1982) placed termophilous *Carpinus orientalis* woods on the one hand (*Carpinion orientalis*) and sub-montane and mountain *Ostrya carpinifolia* (*Seslerio-Ostryon*) on the other hand, in two separate alliances. Both alliances are placed within a new order (*Seslerio-Ostryetalia*), the larger part of which can be referred to the old *Ostryo-Carpinion* sensu Horvat, 1959.

As regards the Italian Peninsula, Poldini (1988), who considered *Ostryo-Carpinion* to be one single large alliance distributed throughout south-eastern Europe, proposed an Apennine *Laburno-Ostryenion* (divided into a group of *Acer opulifolium* associations in north-western parts of the Peninsula, and a group of *Helleborus bocconei* associations in eastern central parts). In addition to *Laburno-Ostryenion*, Poldini (1988) also proposed an illiric-prealpine (*Ostryo-Carpinenion*) sub-alliance and an east–European (*Syringo-Carpinenion*) sub-alliance.

In several further papers Ubaldi, 1980; Ubaldi & Speranza, 1985; Ubaldi, 1988; Ubaldi *et al.*, 1990; Ubaldi, 1995) a new alliance named *Laburno-Ostryon* was proposed and described as occupying an ecological space between *Quercetalia pubescentis* and *Fagetalia sylvaticae (Lathyro veneti-Carpinetalia)*. This new alliance represented mixed mesophilous *Ostrya carpinifolia* and *Quercus cerris* woods which exhibited clear Mediterranean features *Laburno-Ostryon* was intended to take the place of the more mesophilous aspects of *Ostryo-Carpinion*, which consequently became limited to termophilous *Quercus pubescens* and *Carpinus orientalis* woods.

Brullo *et al.* (2001) proposed *Tilio-Ostryon* for the extreme south of the Apennines (and separately for Insubria) in order to obtain a syntaxon which could be considered a geovicariant of *Tilio-Acerion* of *Fagetalia sylvaticae*.

Ubaldi (2003) declassed *Tilio-Ostryon* to a sub-alliance and relocated it within *Doronico-Fagion*. In the same study, Ubaldi declassed *Ostryo-Carpinion* to *Ostryo-Carpinenion* limiting this sub-alliance to the Carso area of Italy, to the Istria area of western Croatia and to Herzegovina and including it within *Quercion humili (pubescenti)-petraeae* and *Quercetalia humili (pubescenti) petraeae*.

SYNTAXONOMICAL DISCUSSION: Within *Laburno-Ostryenion sensu* Poldini (1988), in fact, are placed communities which are very different as regards their synecology and flora, such as xerothermic *Carpinus orientalis* and *Quercus pubescens* open woods, in contact with *Quercus ilex* woods and mesophilous lower supra-Temperate *Ostrya carpinifolia* woods which are rich in species of *Fagetalia*. The lack of data concerning termophilous woods of the central and southern Apennines represented a serious gap for Poldini's syntaxonomical synthesis. One of these gaps, for example, regarded the mid-Tyrrhennian sub-coastal limestone district, where bioclimatic conditions which are fairly similar to those of the western Dynarids are to be found and where some guide species of *Carpinion orientalis* (in primis *Carpinus orientalis*) find their distributional optimum in the Peninsula. Nevertheless, we would agree with the hypothesis that there exists a *Laburno-Ostryenion* which finds its main distribution in the centre-northern Apennines and which is to be considered an endemic sub-alliance of *Carpinion orientalis*. The syn-chorological and syn-ecological significance of this sub-alliance is clearly different from that of *Laburno-Ostryenion* sensu Poldini in that it includes only sub-montane and lower montane woodlands rich in species of *Fagetalia*.

It is not possible for *Laburno-Ostryon sensu* Ubaldi 1980 to be maintained at the level of alliance because it does not have a sufficient number of species differentiating it from the deciduous termophilous forest communities of the Balkans and its distribution area is limited to the Apennines of Emilia-Romagna, Umbria and the Marches. In fact, within *Laburno-Ostryon* only *Helleborus bocconei* and *Melampyrum italicum*[5] are endemic to Italy, while *Lilium bulbiferum* subsp. *croceum*, *Bromus ramosus*, *Laburnum anagyroides*, *Anemone trifolia*, *Euonymus latifolius* are species which have a wider distribution area and *Acer obtusatum* is a species with amphi-Adriatic distribution.

The mixed and mesophilous oak woods of the Ligurian Apennines and the Apuane Alps, similar in that their ecology at *Laburno-Ostryenion* communities, contain a rich range of differential species which have a subatlantic or western-European chorotype, and which therefore constitute an autonomous sub-alliance, *Campanulo-Ostryenion*. The autonomy of *Campanulo-Ostryenion* with respect to *Laburno-Ostryenion* also has a geographical basis, since between the areas in which these two syntaxa occur is to be found the "Tuscan territorial gap", where owing to acid siliceous substrates *Teucrio siculi-Quercion cerridis* or *Erythronio-Quercion petraeae* Turkey oak woods dominate. In the context of south-western Europe, *Campanulo-Ostryenion* (which coincides with what in Poldini (1988) was defined as "a group of *Buphtalmum salicifolium* associations") represents the most westerly fringe of *Carpinion orientalis* and is characterised by a marked reduction in Illyric-Balkan and amphi-Adriatic species and by a closer contact with *Quercion pubescenti*

[5] A recent study (GUBELLINI & PINZI, data ined.) has shown that the distinction between *Melampyrum italicum* Soó and *M. velebiticum* Borbás is effectively based upon characters which can be variable within the species and as a consequence is doubtful from a taxonomical point of view.

petraeae woods.

For xerophitic *Quercus pubescens* woods, which exhibit a scattered distribution in the most inland parts of central Apennines and similarities to the steppic woods of *Quercion pubescenti-petraeae*, reference is made to *Cytiso-Quercenion pubescentis*. Despite the above mentioned similarities, in fact, *Cytiso-Quercenion* appears to be well-suited to the general coenological and biogeographical features of central Apennines and consequently physiognomically floristically and syndynamically involved in the *Carpinion orientalis* alliance context and precisely in its cold-xerophitic fringe. This syntaxonomical choice is justified by the abundant Illyric-balkan and amphi-adriatic component (*Acer obtusatum, Ostrya carpinifolia, Chamaecytisus spinescens, Cercis siliquastrum, Colutea arborescens* etc.) which is often found in these woodlands. In nomenclatural terms, the name *Cytiso-Quercenion pubescentis* was correctly proposed in Ubaldi, 1995 through the typification of the association type (*Peucedano-Quercetum pubescentis*).

Instead the termophilous deciduous woods of the basal and hilly belts which are characteristic of the meso-Mediterranean thermotype should be referred to *Lauro-Quercenion pubescentis*. The greater part of the differential species of this alliance belong to *Quercetea ilicis* and are to be placed in a coenological context in which woody species such as *Carpinus orientalis, Quercus pubescens, Acer monspessulanum Fraxinus ornus, Pistacia terebinthus, Cercis siliquastrum* can assume a dominant role.

Laburno-Ostryenion, Cytiso-Quercenion and *Lauro-Quercenion* are Apennine sub-alliances which, as well as being divided according to the altitudinal belt to which they belong, are also divided on the basis of their syndynamical and synecological level. This scheme is similar, at least in part, to that proposed by Lakušič *et al.* (1982) for Dynarid system (mesophilous *Seslerio-Ostryon* and termophilous *Carpinion orientalis*) to which the proposal made by Lausi *et al.* (1982)[6] could be readily adapted.

Ubaldi's (2003) hypothesis that *Carpinion orientalis* (*Ostryo-Carpinion*) could be declassed into *Ostryo-Carpinenion* finds support neither on bioclimatic grounds, nor on floristic grounds. In fact, most of *Carpinion orientalis* describes sub-Mediterranean-sub-Oceanic woods and these are not easily to be placed in an alliance such as *Quercion pubescenti-petraeae* which has a central-European distrbution typical of continental and sub-continental climates (As mentioned before, only *Cytiso-Quercenion* exhibits environmental conditions which are partly condivisable to those of *Quercion pubescenti-petraeae*).

As regards *Tilio-Ostryon*, it is clear that its sporadic occurrence in the Italian Peninsula (often sub-montane gorges are populated by communities of *Geranio-Fagion*, an alliance of *Fagetalia* very similar to *Tilio-Ostryon*), coupled with the fact that its differential specific component is mainly composed of *Querco-Fagetea* and *Fagetalia* species, are both factors which detract from any argument that this syntaxon has a real coenological and syntaxonomical autonomy.

Despite the fact that it has been widely used in phytosociological literature over the last 50 years, the name *Ostryo-Carpinion orientalis* is to be considered *nomen superfluum* because it contains the original diagnosis of a sintaxon published earlier *Carpinion orientalis* (art. 29c). In fact, in the diagnosis of the original proposal of *Carpinion orientalis* reference was made to two validly described woodland associations of the western Balkans such as *Carpinetum orientalis croaticum* Horvatic 1939 and *Carpino-Cocciferetum* Oberdorfer 1948. In the present paper *Carpinion orientalis* Horvat 1958 is for the first time lectotypified indicating in *Carpinetum orientalis croaticum* Horvatic 1939 the lectotypus of the alliance. Some authors, however, have already referred to the name *Carpinion orientalis* in relatively recent works of syntaxonomical revision (Theurillat *et al.*, 1995; Poldini & Vidali, 1999).

On the basis of the above analysis, in the Italian Peninsula (*sensu strictu*) the alliance *Carpinion*

---

[6] Following the proposal made by Poldini (1982) and Lausi *et al.*, (1982) to institute the new suballiance *Orno-Ostryenion* for *Ostrya carpinifolia* and *Fraxinus ornus* communities in the north-eastern sector of southern Alps, three suballiances could now be complessively considered for Praealps and for the western Dynarids, too. The first suballiance, *Helleboro nigri-Ostryenion* Ubaldi 2003 (*Orno-Ostryenion* Gerdol, Lausi, Piccoli & Poldini in Poldini 1982: nom. inval. art. 5; *Seslerio coeruleae-Ostryenion* Ubaldi 2003: synt. syn.) is extended from lombard Praealps to Friuli and it regards those *Ostrya carpinifolia* and *Fraxinus ornus* woods characterized by species with Praealpine character. The other two suballiances regard mainly Trieste karst territory and western Balkans. One of these suballiances has termophilous features and is *Ostryo-Carpinenion orientalis* Poldini 1982 (=*Ostryo-Carpinenion orientalis illyricum* Horvat *et al.*, 1974 p.p.: nom illeg. =*Ostryo-Carpinenion* Poldini 1988) with *Carpinetum orientalis croaticum* Horvatić 1939 as nomenclatural type. The other suballiance has mesophilous features and could be named *Seslerio autumnalis-Ostryon carpinifoliae* suball. nov. hoc loco which keep both the coenological meaning and characteristic species indicated in Lakušič *et al.*, 1982 for the new alliance *Seslerio-Ostryon* Lakušič, Pavlovic, Redzic 1982 (nom. inval. art. 5) with *Seslerio-Ostryetum* Horvat & Horvatić 1950 (sensu Trinajstic, 1990) as nomenclatural type.

orientalis is to be divided into four separate sub-alliances:

- *Campanulo mediae-Ostryenion carpinifoliae* Ubaldi 1995
- *Laburno anagyroidis-Ostryenion carpinifoliae* (Ubaldi 1995) Blasi, Di Pietro & Filesi stat. nov. hoc loco
- *Lauro nobilis-Quercenion pubescentis* Ubaldi 1995
- *Cytiso sessilifolii-Quercenion pubescentis* Ubaldi 1995

SUB-ALLIANCE 1: *Campanulo mediae-Ostryenion carpinifoliae* Ubaldi 1995
Typus: *Plagio-Ostryetum* Gruber 1968

In this sub-alliance are included *Quercus pubescens, Q. cerris* and *Ostrya carpinifolia* hilly and submontane woods which are mainly to be found in the sub-Mediterranean belt. The sub-alliance occupies a marginal position within peninsular *Carpinion orientalis*, since its distribution area is limited to hill and sub-montane zones of the Marittime Alps, the Apuane Alps and the Ligurian-Piedmont Apennines (Ozenda, 1966; Gruber, 1968; Barbero & Bono, 1970; Barbero *et al.*, 1971; Ubaldi *et al.*, 1990; Mondino *et al.*, 1995; Cresta *et al.*, 1995; Ubaldi, 2003).

In edaphic terms *Campanulo-Ostryenion* communities occur as much on siliceous substrates (grès, schist, quarzite) as on dolomite or calcareous ones. Mixed woods of *Quercus pubescens, Ostrya carpinifolia* and *Fraxinus ornus* are to be found from the upper meso-Mediterranean belt, where they occupy the cooler zones in contact with *Quercus ilex* woods, to the Temperate submontane belt, where instead they grow on south-facing slopes forming small-size open woodlands which are rich in termophilous shrubs such as *Spartium junceum, Juniperus oxycedrus* etc. Moving from coastal areas towards the interior the umbrotypye changes from sub-humid to humid.

The floristic component of *Campanulo-Ostryenion* shows clear effects of the "western" geographical location of this sub-alliance within the Italian Peninsula.
CHARACTERISTIC SPECIES: *Buphtalmum salicifolium, Luzula nivea, Leucanthemum discoideum, Campanula medium, Knautia drymeia* subsp. *drymeia.*
TRANSGRESSIVE AND DIFFERENTIAL SPECIES: *Acer opulifolium, Pulmonaria affinis, Lathyrus pratensis.*

In syndynamic terms these woods are linked to shrubland communities which belong in the main to *Berberidion vulgaris*, and, much more rarely, to *Pruno-Rubion ulmifolii* communities.

SUB-ALLIANCE 2: *Laburno-Ostryenion* (Ubaldi 1995) Blasi, Di Pietro & Filesi stat. nov. hoc loco
Typus: *Ostryo carpinifoliae-Aceretum opulifolii* Ubaldi 1995

These are mesophilous mixed woods which are to be found right along the Apennine chain from Emilia-Romagna to Calabria, in the sub-montaine and lower mountain belt in geoserial contact with beech woods. On calcareous substrates the dominant species is *Ostrya carpinifolia*, while on arenaceous marly substrates or marly calcareous flysch there are mixed woodlands with *Quercus cerris* dominant and *Ostrya carpinifolia*. In spite of the fact that they are mesophilous communities, *Laburno-Ostryenion* woods maintain links with the Mediterranean biogeographical region and this is attested to by the presence of species such as *Rubia peregrina, Lonicera etrusca, Quercus ilex, Cyclamen repandum* etc.

As mentioned earlier, the name *Laburno-Ostryenion* derives from a declassing of the rank of the alliance *Laburno-Ostryon* as proposed in Ubaldi *et al.*, 1990 and subsequently validated in Ubaldi, 1995. The *Laburno-Ostryenion* proposed in Poldini (1988) is not only in disagreement with the diagnosis of the sub-alliance outlined here, but according to ICPN rules it is also to be considered invalid (Art. 5).
CHARACTERISTIC SPECIES: *Helleborus bocconei* subsp. *bocconei, Laburnum anagyroides, Lilium bulbiferum* subsp. *croceum, Sanicula europaea, Digitalis lutea, Melampyrum italicum.*
TRANSGRESSIVE AND DIFFERENTIAL SPECIES: *Lonicera xylosteum, Polypodium gr. vulgare, Carex digitata, Bromus ramosus, Calamintha sylvatica, Bunium bulbocastanum, Euonymus latifolius, Epipactis helleborine, Hepatica nobilis, Lilium martagon, Tilia platyphyllos, Sesleria italica, Doronicum columnae.*

In syndynamical terms the *Laburno-Ostryenion* is linked to secondary shrublands belonging to *Cytision sessilifolii* or locally, within the sub-montane zone, to *Berberidion vulgaris* (Biondi *et al.*, 1988; Fortini *et al.*, 1995; Taffetani, 2000; Cutini & Blasi, 2002; Poldini *et al.*, 2002).

SUB-ALLIANCE 3: *Lauro-Quercenion pubescentis* Ubaldi 1995
Typus: *Asparago acutifolii-Ostryetum carpinifoliae* Biondi *ex* Ubaldi 1995

This sub-alliance describes the termophilous *Quercus pubescens, Carpinus orientalis* and more rarely *Ostrya carpinifolia* woods with abundant presence of *Quercetea ilicis* species. *Lauro-Quercenion* is mainly

distributed along the limestone mountain chains of the Tyrrhenian side of central and southern Italy. The sub-alliance is also to be found sporadically, however, in sub-coastal environments on the Adriatic side of the Peninsula. From an analysis of the available data and from previously phytosociological unpublished data (Di Pietro *ined. dat.*), it emerges that the *Quercus trojana* communities described for the Murgia in Puglia (Bianco *et al.*, 1998) belong to *Lauro-Quercenion* (even if only to its most xerothermic fringe).

The presence of sclerophyllic evergreen species in woods dominated by deciduous oaks dynamically linked to *Pistacio-Rhamnetalia* and *Thero-Brachypodietea* shrublands and grasslands prevents the most termophilous *Lauro-Quercenion* woodlands from automatically being included in *Quercetea ilicis*. As confirm of this it is enough to recall the syndynamical heterogeneity of *Roso-Quercetum pubescentis* (Blasi & Di Pietro, 1998), of *Quercetum frainetto-suberis* (Blasi *et al.*, 1997; 2002), or of some aspects of *Lonicero-Carpinetum orientalis* (Blasi *et al.*, 2001; Blasi & Di Pietro, 2002).

The differential species of *Lauro-Quercenion* are sometimes transgressive species from *Quercetea ilicis*. CHARACTERISTIC SPECIES: *Asparagus acutifolius, Cyclamen repandum, Viburnum tinus, Cercis siliquastrum, Pistacia terebinthus, Anemone hortensis, Laurus nobilis, Quercus trojana.* TRANSGRESSIVE AND DIFFERENTIAL SPECIES: *Phillyrea latifolia, Clematis flammula, Osyris alba, Dorycnium hirsutum, Pinus halepensis, Rosa sempervirens, Dryopteris pallida, Rubia peregrina.*

In syndynamic terms *Lauro-Quercenion* has *Pruno-Rubenion ulmifolii* shrub communities and, locally, *Pistacio-Rhamnetalia alaterni* ones (cfr. Blasi & Di Pietro, 1998; Di Pietro & Filibeck, 2000; Blasi *et al.*, 2001). In the sub-Apennines of Umbria and the Marches and on the centre-northern Adriatic sub-coastal areas the most common dynamical contact is with the termophilous communities of *Cytision sessilifolii* (cfr. Biondi *et al.*, 1990; Catorci & Orsomando, 1997; Allegrezza *et al.*, 1997; 2002).

SUB-ALLIANCE 4: *Cytiso sessilifolii-Quercenion pubescentis* Ubaldi 1995

Typus: *Peucedano cervariae-Quercetum pubescentis* Ubaldi 1995

This sub-alliance describes the cold and xerophilous *Quercus* pubescens woodlands of central Apennines. *Cytiso-Quercenion* is restricted to central Italy (Marches, Umbrian and Abruzzi regions). The southern limit of *Cytiso-Quercenion* coincides with those Abruzzi sectors where sub-continental bioclimates prevail (Fucino basin, Aquilan plain, Capestrano hollow etc.). As a result of such bioclimatic features, *Cytiso-Quercenion pubescentis* woods exhibit a sporadic and scattered distribution. *Cytiso-Quercenion* woodlands are usually found on southern exposure. In some cases, however, these woodlands can be found on north facing slopes too where they are associated to very arid and shallow soils showing a very scarce organic horizon. As expressed in Ubaldi *et al.* (1984), those *Cytiso-Quercenion* woodlands distributed on south facing slopes are to be considered "climatophilous" potential vegetation types whereas the north facing slopes isolated stands are more often extra-zonal formations of long-lasting dynamical stages preceding the mature forestal stage.

Substrates tend to be marly-arenaceous, especially in Marches region, or calcareous (compact limestone, marly-calcareous or calcarenites), in Abruzzi region. In the tree layer *Quercus pubescens* is dominant, sometimes with the co-dominance of *Ostrya carpinifolia* and *Fraxinus ornus*. Frequent coppicing and the effects of grazing have reduced the extension of the woods, which today tend to be found only in fragmented patches. These woods are often savannah-like in appearance and are frequently characterised by a thick shrubby understorey composed of heliophilous shrubland species (*Spartium junceum, Juniperus oxycedrus* subsp. *oxycedrus, Juniperus communis, Cytisus sessilifolius, Pyracantha coccinea* etc.) or grasses (*Bromus erectus, Sesleria nitida*). The herbaceous layer, too, is rich in species coming from nitrophilous edges (*Trifolum medium, Inula conyza etc.*), from xerophilous grasslands and garrigues (*Dactylis glomerata, Teucrium chamaedrys, Chamaecytisus spinescens, Chamaecytisus hirsutum*). In the central Apennines there is a sharp increase in amphi-Adriatic and Illyric-Balkan species and therefore the serial shrublands are referrable to *Cytision.* while the geo-serial adjacent woods are those of *Laburno-Ostryenion, Lauro-Quercenion* and *Aremonio-Fagion sylvaticae* (normally above 1400 m a.s.l.).

In the Italian Apennines *Cytiso-Quercenion pubescentis* is restricted to sub-continental or (more rarely) to sub-oceanic bio-climates. The thermotype ranges from upper-hilly to lower-mountane with very low winter temperatures. The ombrotype ranges from upper-dry to upper sub-humid.

CHARACTERISTIC SPECIES: *Chamaecytisus hirsutus, Chamaecytisus spinescens, Cytisus sessilifolius, Inula salicina, Juniperus oxycedrus* subsp. *oxycedrus,*

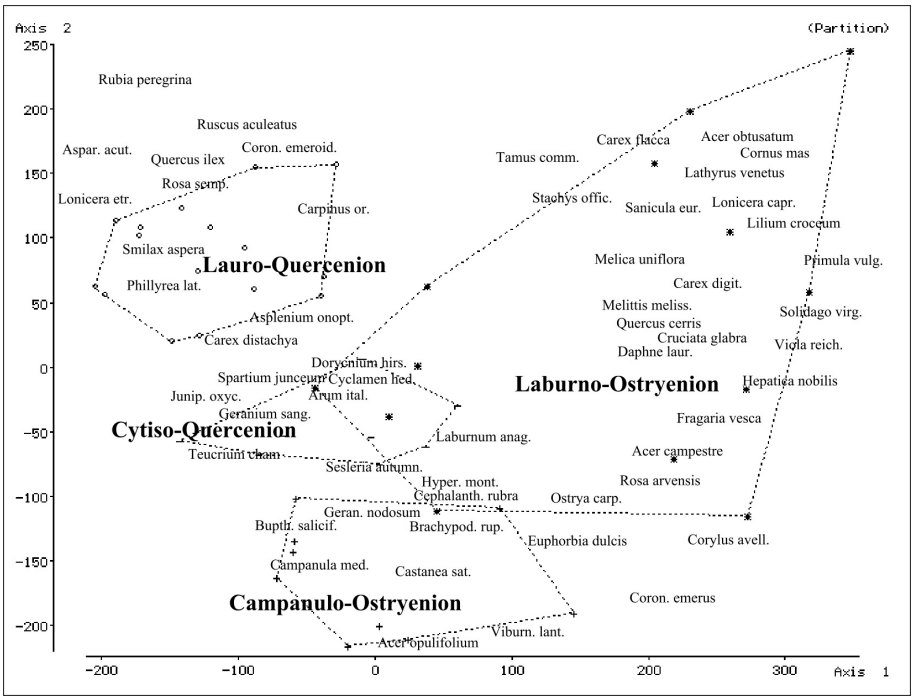


Fig. 5 - Biplot diagram of the four suballiances of *Carpinion orientalis*

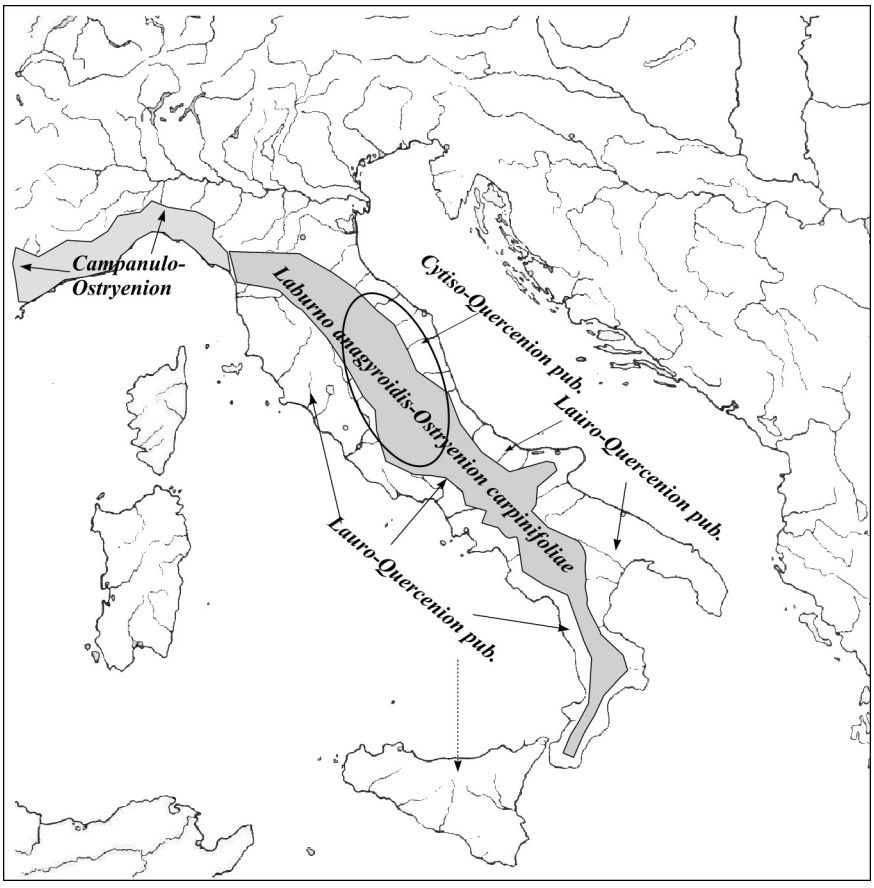


Fig. 6 - Distribution area in peninsular Italy of the four sub-alliances of *Carpinion orientalis*

Melampyrum cristatum, Peucedanum cervaria.

TRANSGRESSIVE AND DIFFERENTIAL SPECIES: *Carex hallerana, Spartium junceum, Helianthemum nummularium* subsp. *obscurum, Knautia purpurea, Polygala nicaensis, Inula conyza.*

ALLIANCE 2: *TEUCRIO SICULI-QUERCION CERRIDIS* Ubaldi 1988 nom. conserv. prop. hoc loco
Holotypus: *Asplenio onopteris-Quercetum cerridis* Ubaldi, Zanotti, Puppi, Speranza & Corbetta ex Ubaldi 1995

DIAGNOSIS: The alliance includes sub-acidophilous *Quercus cerris* woodlands of the basal plain (*Mespilo-Quercetum frainetto* etc.) as well as those of the hilly (*Erico-Quercetum cerridis, Asparago-Quercetum cerridis* etc.) and submontane belts (*Melico-Quercetum cerridis, Physospermo verticillati-Quercetum cerridis, Lathyro digitati-Quercetum cerridis* etc.). Sometimes these woods can be dominated by *Q. frainetto,* (*Malo-Quercetum frainetto, Pulicario-Quercetum frainetto, Quercetum frainetto-suberis*) or, very sporadically by *Quercus pubescens* (*Centaureo-Quercetum pubescentis*). *Teucrio-Quercion* communities, which mainly occur in Temperate environments, are nevertheless influenced by the Mediterranean climate.

Teucrio-Quercion cerridis alliance is endemic to central-southern Italy with a distribution area which is mainly tyrrhenian, but which in some cases can reach the adriatic side of the Apennine (e.g. Taffetani & Biondi, 1995; Biondi & Allegrezza, 1996). At any rate this distribution area seems to coincide with the peninsular distribution area of species such as *Quercus frainetto, Carpinus orientalis, Ptilostemon strictus, Echinops siculus*. As regards its flora, the specific characteristic component of the alliance is comprised of species which are endemic to central-southern Italy, such as *Echinops siculus, Teucrium siculum, Digitalis micrantha*. In biogeographical terms the alliance belongs in part to the western Tyrrhenian province and in part to the Apennine-Balkan province (cfr. Rivas-Martínez & Penas, 2001).

CHARACTERISTIC SPECIES: *Quercus frainetto, Teucrium siculum, Malus florentina, Silene viridiflora, Digitalis micrantha, Iris foetidissima, Echinops siculus, Ptilostemon strictus, Crepis leontodontoides, Cytisus villosus, Veronica chamaedrys, Lychnis coronaria.*

TRANSGRESSIVE SPECIES AND DIFFERENTIAL SPECIES: *Pulicaria odora, Lathyrus niger, Aristolochia rotunda, Mespilus germanica, Malus sylvestris, Oenanthe pimpinelloides, Ranunculus lanuginosus, Poa sylvicola, Asperula laevigata, Genista tinctoria, Rumex sanguineus, Ligustrum vulgare, Alliaria petiolata, Fraxinus oxycarpa,Hypericum perfoliatum.*

HISTORICAL BACKGROUND: Woods dominated by *Quercus cerris* were considered difficult to place within a syntaxonomical framework in a manner that was not ambiguous, in that they were widely considered to be secondary communities derived from beech or downy oak woods (Gentile, 1970; 1982). Subsequently *Quercus cerris* were referred to Balkan-Illyric syntaxa such as *Quercion frainetto* or *Melittio-Quercion frainetto* (Bonin & Gamisans, 1976, Bonin *et al.*, 1976; Bonin, 1978; Bonin, 1980; Blasi, 1985, Pignatti & Pignatti, 1990; Scoppola *et al.*, 1995; Brullo *et al.*, 1999; 2001; Ubaldi, 2003) or central european syntaxa such as *Quercion pubescentis* (cfr. Pignatti, 1998). *Quercion frainetto* Horvat 1954 is an alliance which has subcontinental characteristics (500-600 mm. annual rainfall with cold winters and a large annual temperature range) and forms many woodland potential vegetation types in central-eastern Balkans (Serbia, Macedonia, Bulgaria, southern Romania, northern Greece) (Horvat, 1954; Horvat *et al.*, 1974; Jakucs, 1961).

Quercus frainetto woods of the Peloponnese were located by Barbero & Quézel (1976) within the *Melitto-Quercion frainetto* alliance, due to the marked floristic and bioclimatic differences they display in comparison to *Quercion frainetto* of the north-eastern Balkans. According to Bonin & Gamisans (1977), the *Quercus cerris* of Calabria and Basilicata are also to be placed within *Melitto-Quercion frainetto*. However, *Quercus frainetto* is dominant in Peloponnese, whereas in Calabria and Basilicata it plays a subordinate role to *Quercus cerris* (which, vice-versa, is absent in the *Quercus frainetto* woods of Peloponnese). As a consequence, Bonin & Gamisans (1976) proposed an endemic sub-alliance denominated *Ptilostemono-Quercenion cerridis* within *Melitto-Quercion* for the *Quercus cerris* woods of southern Italy.

Teucrio siculi-Quercion cerridis was proposed in 1988 (Ubaldi o.c.) as an alliance, belonging to the new order *Lathyro nigri-Quercetalia cerridis*, which was typical of the "supra-Mediterranean" oak woods of central-southern Italy. *Asplenio-Quercetum cerris* was indicated as the association type of this alliance. *Asplenio-Quercetum cerris*, however, was described in a study dated 1987 but effectively published only in 1990, by way of a synoptic table. On the basis of ICPN (Art. 2b, 7) *Asplenio-Quercetum cerris* is not validly published and for this reason the name *Teucrio-Quercion cerridis* is invalid (Art. 8). Although Ubaldi (1995) typified and validated *Asplenio-Quercetum cerris* in Tab. 7 of Pedrotti *et al.*

(1979), this did not automatically validate *Teucrio-Quercion* (Art. 9). Ubaldi (1995), however, recognised that his publication of *Teucrio siculi-Quercion cerridis* had been invalid. He therefore proposed that the name *Teucrio siculi-Quercion cerridis* should be considered synonymous with *Lonicero etruscae-Quercion pubescentis* - an alliance proposed for xerothermic mixed woods of central Italy in Arrigoni & Foggi 1988, with a clear synchorological and synecological preference for thermo-acidopholous oak woods of Tyrrhenian central Italy. Ubaldi (2003) reproposed *Teucrio-Quercion cerridis* in the form of a new *Quercetalia pubescenti-petraeae* alliance for oak woods of transition between southern and northern Italy. In a departure from the alliance as originally proposed, the new *Teucrio-Quercion* was placed within *Lathyro veneti-Carpinenalia* and no longer within *Lathyro nigri-Quercenalia cerris.*

Within central Italy, two new alliances - *Crataego laevigatae-Quercion cerridis* (Arrigoni, 1997) and *Lathyro montani-Quercion cerridis* (Scoppola & Filesi, 1998) - were subsequently described for *Quercus cerris* and *Q. petraea* woods of cental Italy. Both these alliances were representative of mesophilous oak woods of the sub-montane zone, however the former was more disposed to different types of substrate, whereas the latter was of a marked acidopholous character.

Ubaldi (2003) proposed a further new alliance denominated *Mespilo-Carpinion betuli*. The nomenclatural type of this alliance was identified as *Coronillo emeri-Quercetum cerris* Blasi 1985, but it was placed in the new order *Aceri-Fagetalia*. Obviously, for the same reasons as those given above in connection with the eventual presence of orders other than *Quercetalia pubescenti petraeae*, Ubaldi's proposal for *Aceri-Fagetalia* is cited here for purposes of bibliographical documentation only.

SINTAXONOMICAL DISCUSSION*: Quercus cerris* can be considered the forest species which is most representative of the Italian Peninsula. Not only does it have a wide distributional range in the Peninsula, but it also displays an extremely variegated coenological pattern. This leads to it assuming the role of guide species in a large number of communities which also differ considerably one from the other. On the basis of the information currently available (regarding, above all, flora, bioclimate and biogeography) the assigning of the *Quercus cerris* in Italy to *Quercion frainetto* appears inappropriate. *Quercus cerris* and *Quercus frainetto* woods in the Italian Peninsula belong to a bioclimatic context which is essentially oceanic or sub-oceanic, though with much higher rainfall and with lower annual temperature ranges than those characterising the Balkan Peninsula *Quercion frainetto* woodlands. Of the characteristic species of *Quercion frainetto*, it would appear that the only ones to occur in the Italian Peninsula are: *Pyrus pyraster, Potentilla micrantha, Quercus frainetto* and, very sporadically, *Silene viridiflora* e *Lychnis coronaria*.

Likewise, *Melitto-Quercion frainetto*, although it have been often utilized by italian phytosociologist (Abbate & Paura, 1995; Zanotti *et al*., 1995; Fanelli, 2002; Ubaldi, 2003 etc.) is not able to serve as a reference for the *Quercus cerris* and *Q. frainetto* woodlands of southern Italy, either. In fact, from the present study it emerges that high levels of floristic similarity exist between *Quercus cerris* and *Quercus frainetto* woods of southern Italy and those of central Italy. Furthermore, the absence of *Quercus pubescens*, *Q. petraea* and especially of *Q. cerris* (still dominant in southern Italy) from those *Quercus frainetto* woods of Peloponnese which are considered as belonging to *Melitto-Quercion*, amounts to a differential biogeographical factor at the level of alliance for the oak woods of southern Italy.

To the other hand, *Lonicero etruscae-Quercion pubescentis*, an alliance which is often placed in syntaxonomical synonymy with *Teucrio-Quercion cerridis*, also presents some problems of a nomenclatural nature[7] and it is to be considered as invalid (Theurillat & Moravec, 1991). Nevertheless, in

[7] Arrigoni & Foggi (1988) indicated the association *Erico-Quercetum cerris* Arrigoni, Mazzanti & Ricceri 1989 as the type association of the alliance. According to the bibliographical references this association, which at that time had still not been published, should have been included in a later volume of the journal "Webbia" in a paper entitled "Contributo alla conoscenza dei boschi della Maremma grossetana" by Arrigoni, Mazzanti & Ricceri. However, this paper, which was eventually published only in 1990 (and not in 1989), contained no reference to *Erico-Quercetum cerridis* Arrigoni Mazzanti & Ricceri ass. nova, and referred only to *Erico-Quercetum cerris* Arrigoni ass. nova. A discrepancy therefore exists between the nomenclatural type cited in Arrigoni & Foggi (o.c.) and the full name of the association actually published in Arrigoni, Mazzanti & Ricceri (o.c.). Nevertheless, in its first proposion (1988) *Lonicero-Quercion pubescentis* already included an association appropriate for its typification, which had already been validly published some years earlier. This association was *Corno-Ostryetum* Blasi *et al*. 1982 – which the authors originally included in *Carpinion orientalis* (*Ostryo-Carpinion*) – and which was the only association effectively cited in the Arrigoni *et al.* paper as belonging to their new alliance. Even if it was very different from *Erico-Quercetum cerris* in physiognomical and coenological terms, *Corno-Ostryetum* was still well-suited to the diagnosis of *Lonicero-Quercion pubescentis* provided by the authors, who indicated the alliance as a vicariant of *Carpinion orientalis* in the peninsula. Consequently, because the present study recognises a wide distribution for *Carpinion orientalis* in the Italian peninsula, and because *Corno-Ostryetum* clearly belongs to *Carpinion orientalis*, then *Lonicero-Quercion pubescentis* and *Carpinion orientalis* would enter into syntaxonomical synonymy.

support of the refuse to prefer the name *Lonicero etruscae-Quercion pubescentis*, over and beyond the nomenclatural reasons, is the inadequacy of this alliance as a syntaxon capable of representing the entire range of *Quercus cerris* in the Italian Peninsula, and in particular the *Quercus cerris* and *Quercus frainetto* woods of central-southern Italy. In fact, the original description of *Lonicero-Quercion* made explicit reference to the fact that *Lonicero-Quercion* referred only to termophilous woods experiencing summer drought stress ("cingolo a *Quercus pubescens*" sensu Schmidt, 1963), whereas mesophilous woods were to be assigned to other alliances. It is therefore clear that on the basis of its original diagnosis, *Lonicero-Quercion pubescentis* does not have sufficient synecological and synchorological support to justify its being placed at the hierarchical level of alliance (it should not be forgotten that a part of *Lonicero-Quercion*, that concerning *Ostrya carpinifolia* and *Quercus pubescens* woods overlaps *Carpinion orientalis* to a substantial extent). Lastly, the presence of *Quercus pubescens* in the nomenclatural binomial causes considerable confusion, since *Lonicero-Quercion pubescentis* is representative of acidopholous woodlands and as such includes almost exclusively *Quercus cerris* woods in which *Quercus pubescens* is a species which occurs only sporadically. Although *Quercus cerris* forest communities can be placed in various alliances which belong to different orders (*Quercetalia pubescenti-petraeae* and *Fagetalia sylvaticae*), nevertheless, in peninsular Italy such communities find their centre of distribution in the endemic alliance *Teucrio siculi-Quercion cerridis*.

Mespilo-Carpinion betuli (Ubaldi, 2003) displays clear coenological overlapping with a part of the other alliances mentioned above. In fact, this alliance exhibits a lack of real coenological autonomy, which can be gathered as much from the original diagnosis of the author, as from the choice of *Coronillo emeri-Quercetum cerris* as nomenclatural type. Moreover, it seems rather implausible that the ecological space of *Mespilo-Carpinion* could be limited solely to the oak woods occurring on the extra-Apennine vulcanites of central Italy, and that *Mespilus germanica* could be the only differential taxon of the alliance. However, the name *Mespilo-Carpinion betuli* is currently to be considered invalid (Art. 5).

The interpretation of *Teucrio siculi-Quercion cerridis* which Ubaldi made in 1988, seeking to emphasise the synecological and biogeographical continuity of *Quercus cerris* throughout the whole of central-southern Italy, together with the appropriate choice of nomenclatural binomial (based on the central-southern endemic *Teucrium siculum*) and the overall ecological and chorological features of the alliance, have in combination meant that almost all Italian botanists have made reference to it right up to the present day (Blasi & Paura, 1995; Paura & Abbate, 1995; Abbate & Scagliusi, 1995; Scoppola *et al.*, 1995; Scoppola & Filesi, 1995; Blasi *et al.*, 1997; Scoppola, 1998; Catorci & Orsomando, 1998; Orsomando *et al.*, 1998; Biondi *et al.*, 1998; Biondi *et al.*, 2001; 2002; Blasi *et al.*, 2002a; 2002b).

The most recent proposal made in Ubaldi (2003) for the name *Teucrio-Quercion* as all. nov. is still illegitimate (Art. 29c). This new proposal of *Teucrio-Quercion*, however, was not more in agreement with the original synecological and synchorological diagnosis provided in Ubaldi, 1988. Although the nomenlatural vicissitudes to which this name has been subject from the time it was first proposed to today, the large use made of this alliance name among phytosociologists led us to propose to the ICPN commission the name *Teucrio-Quercion* as "nomen conservandum". This new proposal of *Teucrio-Quercion* keeps a significant part of the original synecological meaning of *Teucrio-Quercion* sensu Ubaldi (1988), but is distinct as regards both the specific characteristic component and the synchorology. According to Ubaldi (1988), the association *Asplenio-Quercetum cerridis* is confirmed as nomenclatural type of *Teucrio Quercion cerridis*. This association is based on Tab. 7 in Pedrotti et al., 1979 from which the lectotype of *Asplenio-Quercetum cerridis* (rel. 9) was chosen in Ubaldi, 1995[8].

According to the synoptic table (Tab. 5) the floristic, coenolocical and physiognomical features of both *Melico uniflorae-Quercetum cerridis* and *Cephalanthero longifoliae-Quercetum cerridis* Scoppola & Filesi 1998 lead these associations to be included in *Teucrio-Quercion* alliance. These same associations, however, were originally indicated as nomenclatural types of two different alliances, respectively *Crataego laevigatae-Quercion cerridis* Arrigoni 1997 and *Lathyro montani-Quercion cerridis* Scoppola & Filesi 1998

Nevertheless, in itself the diagnosis of these two alliances allows *Crataego-Quercion* and *Lathyro-Quercion* to be included within *Teucrio-Quercion*. To

[8] According to the footnote nr. 7 in Ubaldi (1995) the record of *Teucrium scorodonia* in Table 7 of Pedrotti et al. (1979) is to be substitute by *Teucrium siculum*.

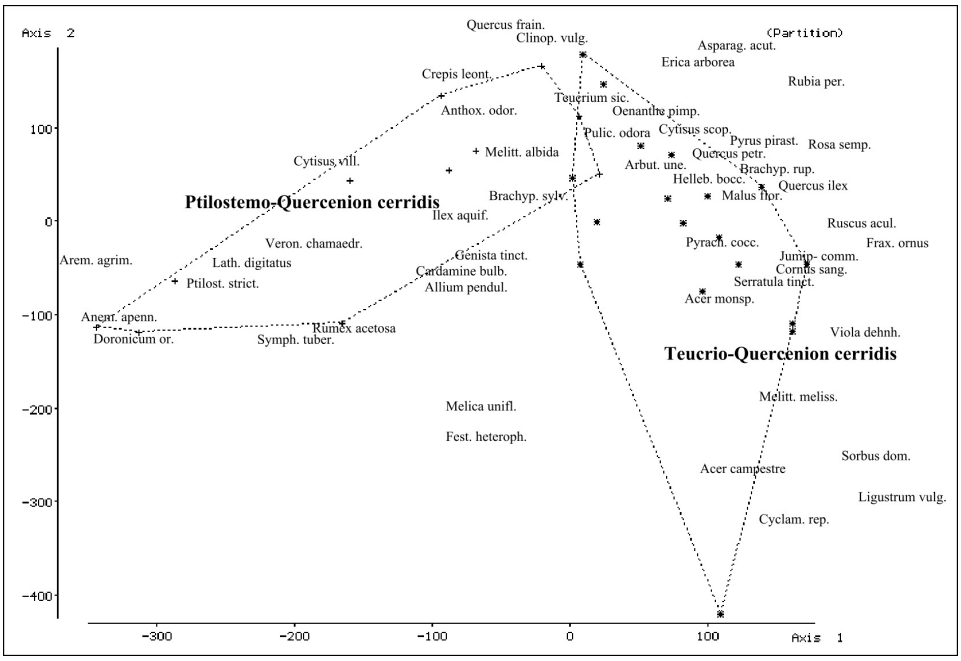


Fig. 7 - Biplot diagram of the two suballiances of *Teucrio siculi-Quercion cerridis*

Fig. 8 - Distribution of the three alliances which include *Quercus cerris* woodlands in peninsular Italy (*Teucrio-Quercion cerridis* is divided into sub-alliances which are denoted by italics)

the one hand, *Crataego laevigatae-Quercion cerridis* is an extremely heterogeneous alliance within which can be found woodland communities that differ markedly from each other, such as the hop-hornbeam of *Campanulo-Ostryenion* (*Roso-Ostryetum carpinifoliae*), mixed *Quercus-Ostrya* communities of *Laburno-Ostryenion* (*Aceri-Quercetum cerridis*), meso-hygrophilous woodland communities of *Carpinion betuli* (*Carpino-Coryletum, Geranio nodosi-Carpinetum*), or *Populetalia* (*Polygonato-Quercetum roboris*). Nevertheless, in its original diagnosis *Crataego-Quercion* was defined as an alliance which mainly included meso-hygrophilous woodlands occurring on north-faicing slopes in the upper hilly and sub-mountain belts – comparable to the "cingolo *Quercus-Tilia-Acer*" sensu Schmidt. The possibility that syntaxonomical synonymy exists between *Crataego-Quercion* and *Teucrio-Quercion cerridis*, was also stated in Ubaldi (2003). Although in the diagnosis of *Crataego-Quercion* itself, it is emphasised that the woodlands of this alliance are distinguishable from termophilous *Quercus pubescens*, *Q. cerris* and *Q. frainetto* woodlands belonging to *Lonicero-Quercion pubescentis*, (which, as mentioned above, also coincides syntaxonomically with *Teucrio-Quercion cerridis*), it is nevertheless clear that the *Crataego-Quercion* itself does not have an ecological and biogeographical space which is appropriate to the hierarchical rank of alliance. Also the type-association of the alliance (*Melico-Quercetum cerridis*), includes species like *Quercus frainetto, Erica arborea, E. scoparia, Oenanthe pimpinelloides, Pulicaria odora, Digitalis micrantha, Rosa sempervirens* (etc.) which means that it can be comfortably placed within *Teucrio siculi-Quercion cerridis*.

To the other hand *Lathyro montani-Quercion cerridis* exhibit a clear discordance between the diagnosis of the alliance and the floristic and coenological features of *Cephalanthero-Quercetum cerris* (which is the only association included in that alliance). In fact the syn-distribution area which was hypothesised for *Lathyro-Quercion cerridis* involved mainly northern Apennine, while *Cephalanthero-Quercetum*, described for a very restricted area of northern Latium, was still belonging to central Italy coenological context. In addition to syn-chorological reasons, however, the occurrence in *Cephalanthero-Quercetum* of species such as *Teucrium siculum, Silene viridiflora, Echinops siculus, Erica arborea* and a very scarce occurrence of species of both *Fagetalia* and *Quercetalia robori-petraeae* lead to include this community in *Teucrio-Quercion cerridis*.

On the basis of how mentioned before, and in order to follow the directives of the third edition of ICPN which has given the possibility of retaining well-known and long accepted names as "nomina conservanda" the name *Teucrio siculi-Quercion cerridis* Ubaldi 1988 is here proposed as nomina conservanda upon both *Lathyro montani-Quercion cerridis* Scoppola & Filesi 1998 and *Crataego laevigatae-Quercion cerridis* Arrigoni 1997.

The alliance *Teucrio siculi-Quercion cerridis* is divided into two sub-alliances which are geographically distinct from one another: *Teucrio siculi-Quercenion cerridis* (central-northern Apennines) and *Ptilostemo stricti-Quercenion cerridis* (southern Apennines).

SUB-ALLIANCE 1: *Teucrio siculi-Quercenion cerridis* suball. nov. hoc loco
Holotypus: *Asplenio onopteris-Quercetum cerridis* Ubaldi, Zanotti, Puppi, Speranza & Corbetta ex Ubaldi 1995.

The sub-alliance *Teucrio siculi-Quercenion cerridis* describes central peninsular *Quercus cerris* woodlands occurring on sub-Apennine hills and coastal mountains (mainly in the Tyrrhennian district) within an area that extends from southern Tuscany to northern Campania and also includes small parts of the southern Marches, Abruzzo and Molise.

To this sub-alliance belong *Quercus cerris* and mixed Oak woods characterised by an abundant evergreen component of *Quercetalia ilicis*, or locally of *Pistacio-Rhamnetalia alaterni* (*Quercetum-frainetto suberis* of southern Lazio). In other cases, (*Erico-Quercetum cerris* in Tuscany) communities are to be found in which termophilous species such as *Phillyrea latifolia, P. angustifolia, Erica arborea, Rosa sempervirens, Cistus salvifolius* etc. coexist with mesophilous species such as *Quercus petraea, Castanea sativa, Populus tremula, Melica uniflora, Brachypodium sylvaticum, Lathyrus montanus* etc. The termophilous communities of *Teucrio-Quercenion cerridis* have been shown to be correlated with lower meso-Mediterranean and meso-Temperate thermotypes ranging in altitude from sea-level up to 600-700 metres. From the edaphic point of view the communities are more commonly linked to siliceous and volcanic substrates which are responsible for an increase in moderately acidophilous species. The mesophilous aspects of *Teucrio-Quercenion cerridis* are mainly located on gentle north-facing slopes on deep and well-drained colluvial soils containing a fair amount of clay and that partly increases hydric retention. Substrates which are mainly vulcanic, arenaceous or

flysch tend to produce a largely acid or subacid reaction.

The group of associations which are referred to this sub-alliance are to be found in relatively cool bioclimatic contexts (which may at times give rise to very prolonged periods of winter cold-stress) having substantial rainfall. Almost all the woods, in fact, are typical of the upper hill to lower mountain zones of the Temperate region, where ombrotypes range from sub-humid to lower hyper-humid. At lower altitudes, in subcoastal areas, only typically extrazonal morphotypes such as ravines or valley-floors can still be referred to the Mediterranean region.

The physiognomy of these woods is largely determined by *Quercus cerris* as dominant, with subordinate *Quercus frainetto, Quercus petraea, Quercus pubescens, Acer monspessulanum, Acer opalus subsp. obtusatum, Acer campestre, Carpinus betulus, Sorbus torminalis* and more rarely *Ostrya carpinifolia*. *Teucrio-Quercenion* communities are further characterised by the presence of termophilous species such as *Erica arborea, Erica scoparia, Rosa sempervirens, Echinops siculus, Malus florentina, Lonicera etrusca, Viola alba* subsp. *dehnhardtii, Rubia peregrina*. Nevertheless in the more mesophilous communities it is not uncommon to find species typical of mesophilous sub-montane deciduous woods such as (*Brachypodium sylvaticum, Euphorbia amygdaloides, Melica uniflora, Viola reichembachiana, Daphne laureola, Rubus hirtus, Crataegus laevigata etc.*).

CHARACTERISTIC SPECIES : *Erica arborea, Carex sylvatica, Lychnis flos-cuculi, Quercus crenata, Carex depauperata, Carex grioletii.*

TRANSGRESSIVE AND DIFFERENTIAL SPECIES: *Hieracium racemosum, Crataegus laevigata, Cytisus scoparius, Arbutus unedo, Pyracantha coccinea, Erica scoparia*. This particular combination of species reflects the fact that slightly termophilous communities are present in the sub-alliance, together with mesophilous communities.

In syndynamic terms *Teucrio-Quercenion* woodlands are linked to shrubby communities belonging mainly to the subacidophilous aspects of *Pruno-Rubenion ulmifolii*, or *Sarothamnenion scoparii* (Blasi *et al.*, 1992; Biondi, Calandra *et al.*, 2002; Blasi, Cutini *et al.*, 2002). The more termophilous communities may have *Pistacio-Rhamnetalia* shrubby edges in their more mesophilous and acidophilous aspect (Blasi *et al.*, 2002a), while the forest communities of cooler parts of northern Lazio or Tuscany exhibit serial contact with *Berberidion, Cytision, Pruno-Rubion fruticosi* (Scoppola & Filesi, 1995; Scoppola, 1998; Arrigoni, 1998). From syntaxonomical and nomenclatural points of view, *Teucrio siculi-Quercenion cerridis* suball. nova hoc loco is the sub-alliance type of *Teucrio-Quercion cerridis* (Art. 28).

SUB-ALLIANCE 2: *Ptilostemo stricti-Quercenion cerridis* Bonin & Gamisans 1976

Typus: *Lathyro digitati-Quercetum cerridis* Bonin & Gamisans 1976

The sub-alliance *Ptilostemo-Quercenion cerridis* includes *Quercus cerris, Quercus frainetto* and *Quercus pubescens* woodlands of the upper-hill, sub-montane and lower-mountain zones of southern Italy. In synchorological terms the sub-alliance exhibits its optimum in southern Campania, Basilicata and Calabria, with localised occurrences in northern Campania, Molise and Apulia. *Ptilostemo-Quercenion* is characterised principally by south-eastern European orophytes and endemic species with a significant presence of the Mediterranean component (which in southern Italy can become extremely marked). Differential species of the sub-alliance are: *Centaurea centaurium, Digitalis ferruginea, Echinops sphaerocephalus* subsp. *albidus, Euphorbia corallioides, Helleborus bocconei* subsp. *siculus, Heptaptera angustifolia, Huetia cynapioides, Iris collina, Lathyrus digitatus, Lathyrus grandiflorus, Lathyrus jordanii, Melittis albida, Paeonia mascula* subsp. *mascula, Physospermum verticillatum, Ranunculus neapolitanus, Stachys heraclea, Trifolium patulum, Vicia barbazitae, Vinca major*. Some of these species (*Stachys heraclea, Echinops sphaerocephalus* and *Lathyrus digitatus*) were already indicated as characteristics by Bonin & Gamisans in the first publication of the sub-alliance. To these the authors later added *Oenanthe pimpinelloides, Elaeoselinum asclepium, Crepis leontodontoides* ed *Hypericum perfoliatum*. However, for a variety of reasons none of these species is in reality able to assume a differential role within the sub-alliance. On the basis of their distribution area and synecological characteristics, *Crepis leontodontoides, Oenanthe pimpinelloides* ed *Hypericum perfoliatum* could be expected to take on a differential role at the level of alliance. *Elaeoselinum asclepium*, on the other hand, is a heliophilous species which is characteristic of sub-mountain garrigues and post-fire Mediterranean dry grasslands and does not belong to a forest context. (cfr. Lucchese, 1995; Filesi *et al.*, 1996). The present study adds to the differential species of the original *Ptilostemo-Quercenion*, some nemoral endemics of the southern Apennines: *Lathyrus jordanii, Centaurea centaurium, Heptaptera angustifolia* and *Arum apulum*. To these are also added

some further species which, although having an Apennine-Balkan distribution, exhibit a sub-distribution area in Italy which is restricted to the south or centre-south of the Peninsula (e.g. *Euphorbia corallioides*, *Physospermum verticillatum*, *Lathyrus grandiflorus*, e *Huetia cynapioides*).

CHARACTERISTIC SPECIES: *Lathyrus digitatus*, *Physospermum verticillatum*, *Lathyrus grandiflorus*, *Helleborus bocconei* subsp. *siculus*, *Melittis albida*, *Heptaptera angustifolia*, *Echinops sphaerocephalus* subsp. *albidus*, *Paeonia mascula*, *Vicia barbazitae*, *Lathyrus jordanii.*

TRANSGRESSIVE AND DIFFERENTIAL SPECIES: *Euphorbia corallioides*, *Digitalis ferruginea*, *Huetia cynapioides*, *Centaurea centaurium*, *Vinca major*, *Stachys heraclea*, *Trifolium patulum*, *Pimpinella anysoides*, *Stipa bromoides.*

As mentioned above, *Ptilostemo-Quercenion cerridis* was originally included in *Melitto-Quercion frainetto*. The syntaxonomical proposal being made here unites the *Quercus cerris* of the Italian Peninsula within a single endemic alliance (*Teucrio siculi-Quercion cerridis*) and restricts *Melittio-Quercion frainetto* to the southern Balkans.

Ptilostemo-Quercenion cerridis woods display syndynamical characteristics which are similar to those already described for *Teucrio-Quercenion*, but with an increased presence of *Pruno-Rubenion* and *Berberidion* communities. On soils which are particularly acidic it is possible to find these woodlands in serial contact with the shrublands of *Ericion arboreae* (cfr. Brullo *et al.*, 2001).

ALLIANCE 3: *PINO CALABRICAE-QUERCION CONGESTAE* Brullo *et al.* 1999

Typus: *Vicio cassubicae-Quercetum cerridis* Brullo & Marcenò 1985

DIAGNOSIS: The communities belonging to this alliance in Sicily are to be found both in the interior of the island and in coastal areas where, however, they occur only on the cooler and wetter slopes of the Tyrrhennian littoral (Brullo & Marcenò, 1985; Brullo *et al*., 1999). The alliance, however, can also occur in the bioclimatic context typical of Oleo-Ceratonion and *Quercion ilicis* where substrates are of volcanic origin and have a high water-retention capacity. In *Pino-Quercion congestae* communities, especially in the more termophilous ones, an evergreen component is always present, even if this is never dominant over the deciduous component (particularly if just the arboreal component is considered). This model is similar as regards structure and synecology to some types of termophilous oak woods of central Italy, which indeed are characterised by high frequency and cover percentages of *Pistacio Rhamnetalia* species. In edaphic terms *Pino-Quercenion congestae* occurs on a variety of substrate types, ranging from calcareous and marly (*Oleo-Quercetum virgilianae*) to neutral-basiphilous vulcanites (*Mespilo-Quercetum virgilianae*, *Celtido-Quercetum virgilianae*) to quartzy-sandstones or flysch (*Quercetum leptobalanae*) and to sandy-conglomerates substrates (*Erico-Quercetum congestae*).

In syndynamic terms the shrubland communities belonging to this alliance are rather heterogeneous, as a function, in particular, of altitude and type of substrate. At lower altitudes it is mainly *Pistacio-Rhamnetalia* shrublands which are to be found, while at higher altitudes *Pruno-Rubion* communities become more abundant and can, especially in Sicily, even reach the mountain plain (cfr. Brullo, 1983; Raimondo, 2000; Brullo *et al.*, 2001, Blasi, Cutini *et al.*, 2002).

The alliance *Pino-Quercion congestae* occurs in the main in areas characterised by the meso-Mediterranean thermotype, and more marginally in areas characterised by thermo-Mediterranean and supra-Mediterranean thermotypes, ranging umbrothermically from upper-dry to lower-humid. Oak woods growing at the highest altitudes, instead, fall within the Temperate region (meso-Temperate thermotype and upper sub-humid, lower humid umbrotype).

CHARACTERISTIC SPECIES: *Thalictrum calabricum*, *Helleborus bocconei subsp. intermedius*, *Silene sicula*, *Quercus amplifolia*, *Paeonia mascula* subsp. *russii*, *Scutellaria columnae* subsp. *gussonei*, *Rubus aetnicus*, *Myosotis sylvatica* subsp. *elongata*, *Agropyron panormitanum.*

TRANSGRESSIVE SPECIES AND DIFFERENTIAL SPECIES: *Clinopodium vulgare* subsp. *arundanum*, *Celtis australis*, *Aristolochia clusii*, *Calicotome infesta*, *Centaurea parlatoris*, *Allium siculum*, *Betula aetnensis*, *Achillea ligustica*, *Allium paniculatum*, *Carex distachya.*

HISTORICAL BACKGROUND: Brullo & Marcenò, 1985 included in *Quercetalia ilicis* not only the evergreen forest vegetation, but also all deciduous woods occurring between sea-level and an altitude of 1400-1500 metres. They argued that *Quercetalia pubescenti-petraeae* could not be present in Sicily, on the one hand because of the absence of *Quercus pubescens* (to the binomial of which, according to the authors, other species had also been erroneously referred, namely *Q. dalechampii*, *Q. amplifolia*, *Q. virgiliana*, *Q. leptobalana*) and on the other hand because of the presence of many *Quercetea*

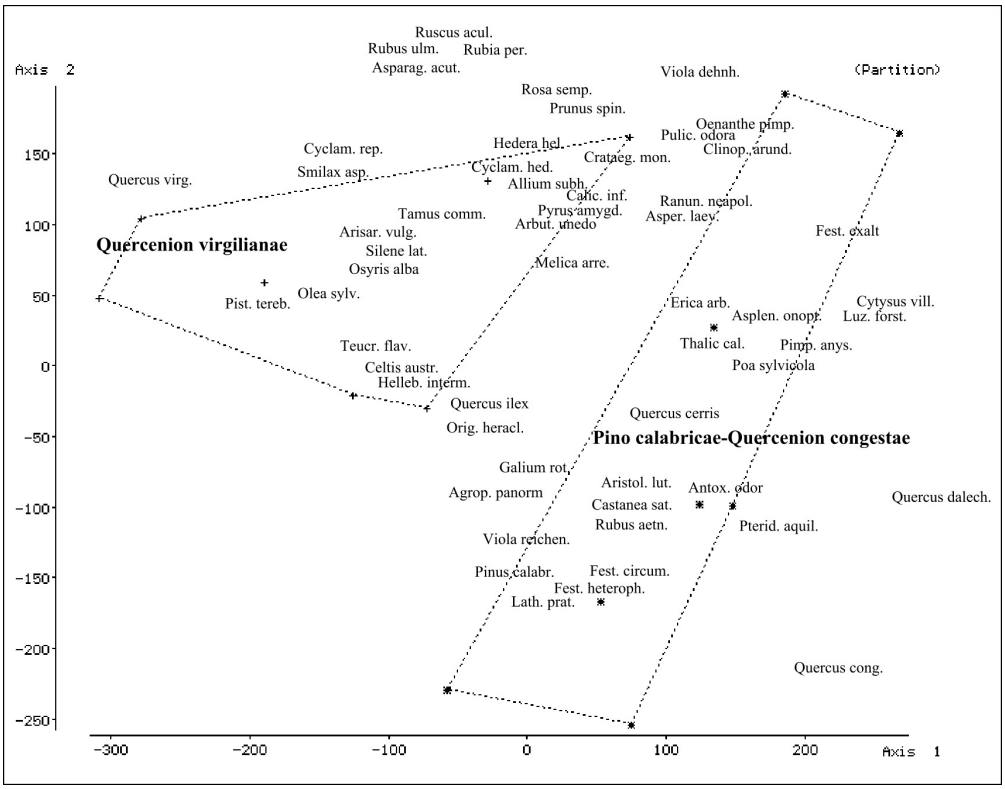


Fig. 9 - Biplot diagram of the two suballiances of *Pino calabricae-Quercion congestae*

ilicis species even in the most typically mesophilous of oak woods. From strictly coenological and ecophysiological viewpoints a clear similarity exists between the endemic species of decidous oak woods and *Quercus pubescens.* In a more recent study (Brullo *et al.*, 1999) the presence of *Quercetalia pubescenti-petraeae* in Sicily was recognised, even if only within a narrow altitudinal belt and with a very limited number of communities.

From a syntaxonomical standpoint the deciduous oak woods of Sicily were therefore placed (Brullo *et al.*, 1999) in two separate classes (*Quercetea ilicis* e *Querco-Fagetea*). Basiphilous oak woods were put in *Quercion ilicis*, while acidophilous oak woods were put in *Erico-Quercion ilicis*, where they mainly characterize the suballiance *Quercenion dalechampii* (8 associations), rather than the typical sub-alliance *Erico-Quercenion ilicis* (one association). Within *Quercetalia pubescenti-petraeae* two associations (one *Quercus cerris* and one *Quercus congesta* wood) were included in *Pino-Quercion congestae*, while the woods with *Quercus frainetto* of southern Calabria were put in *Quercion frainetto* (*Cytiso-Quercetum frainetto*) and *Quercenion dalechampii* (*Quercetum frainetto-ilicis*).

Within the order *Fagetalia sylvaticae* and the alliance *Doronico-Fagion*, instead, four associations were placed, of which two were *Quercus cerris* woods and two were *Quercus petraea* woods). Recently (Brullo *et al.*, 2001), the distribution area of *Pino-Quercion congestae* was extended to include the Aspromonte massif at the southern tip of the Italian Peninsula, where two associations namely *Erico-Quercetum congestae* and *Festuco-Aceretum neapolitani* (this latter was originally described in Mazzoleni & Ricciardi (1995) for the Peninsula Sorrentina in Campanian region) were considered as to be included in this alliance.

Ubaldi (2003), proposed the new alliance *Festuco exaltatae-Quercion humilis* as an intermediate syntaxon between *Quercion frainetto* and *Quercion ilicis*. This new alliance finds its optimum of distribution in Sicily but it can also be found throughout southern Italy (Campania, Basilicata and Calabria). The holotype of the alliance is indicated as *Festuco heterophyllae-Quercetum congestae* Brullo & Marcenò 1984. Within *Festuco-Quercion humilis* the author included the greater part of those woodland communities which previously other authors had placed in *Quercetalia ilicis*.

SYNTAXONOMICAL DISCUSSION: The phytosociological tables provided in Brullo & Marcenò (1984) refer to most of the Sicilian forest communities which have been published to date and examining these tables it is apparent that the dominance of the *Quercetea ilicis*

floristic component is due to the fact that species of the Mediterranean biocora are, to a greater or lesser extent, always present. The sampling methodologies in use in the early 1980's paid little attention to identifying the different "elements" of the vegetation series, but nevertheless they were useful in understanding the coenological character of communities and the outlines of what today are called "geosigmeta" or "landscape units". This explains, for example, the simultaneous presence of *Quercus virgiliana* and *Euphorbia dendroides.* Moroever, it is today unlikely that species which are typical of deciduous oak woods (and in some cases of termophilous beech woods), such as *Cytisus villosus, Poa sylvicola, Cnidium silaifolium, Paeonia mascula, Clinopodium vulgare, Fraxinus ornus, Festuca exaltata, Cyclamen hederifolium Asperula laevigata, Luzula forsteri, Echinops siculus, Melittis albida, Teucrium siculum, Silene viridiflora* etc., could be placed within the class *Quercetea ilicis*.

On the basis of floristic, coenological and physiognomical-structural considerations it is our opinion that the syntaxonomical scheme proposed more recently in Brullo *et al.* (1999) is also in need of significant modification. Almost all deciduous oak woods, whether they are dominated by *Q.virgiliana* or by *Q. congesta, Q. leptobalana, Q.dalechampii, Q. gussonei* or *Quercus cerris*, would be more appropiately placed within *Quercetalia pubescenti-petraeae*. In general these are deciduous woods of the sub-montane or lower-mountain belts in which species of the *Quercetea ilicis* class play a subordinate, or anyway differential, role, to that of *Querco-Fagetea* species. What is more, many of the species which were considered to be differentials of the alliance *Erico-Quercion ilicis* and the sub-alliance *Quercenion dalechampii* (*Teucrium siculum, Mespilus germanica, Cytisus villosus, Pulicaria odora, Echinops siculus, Melittis albida, Festuca exaltata* ecc.) had already been considered as characteristic of *Teucrio siculi-Quercion cerridis* or *Melittio-Quercion frainetto* and therefore could have assumed the role of differential only if *Quercus ilex* woods were effectively present. For these reasons the ecological space of *Quercion ilicis* and *Erico-Quercion ilicis* in Sicily needs to be reduced and limited primarily to *Quercus ilex* and *Quercus suber* woods. Deciduous oak woods, on the other hand, need to be placed within *Quercetalia pubescenti-petraeae* or *Fagetalia sylvaticae*.

Furthermore, the deciduous oak woods of Sicily display a certain floristic similarity with the communities of *Ptilostemo-Quercenion cerridis* (*Melittis albida, Huetia cynapioides, Lathyrus digitatus, Physospermum verticillatum*). Despite this similarity, however, the distinctive features of the woody component means these woods are to be better placed within *Pino-Quercion congestae*. Of particular relevance, in fact, is the presence not only of *Quercus congesta* (suggesting that interesting biogeographical links with Sardinia could exist), but also of other species of the *Quercus* family which are considered endemic, or sub-endemic, to the island.

The original diagnosis of *Pino-Quercion congestae* limited the alliance to the mountain woods occurring on Etna vulcanites and on the acid substrates of Aspromonte (cfr. Brullo *et al.*, 1999; Brullo *et al.*, 2001). Here a significant synecological and synchorological widening for the alliance is proposed, to include, in addition to acidophilous woods, also basiphilous woods occurring in the hilly, sub-montane and (sporadically) lower-mountain belts, where *Geranio versicoloris-Fagion* communities are also present. According to this new interpretation *Pino-Quercion congestae* is to be divided into two sub-alliances - *Pino-Quercenion congestae* and *Quercenion virgilianae.*

The alliance *Festuco exaltatae-Quercion humilis* Ubaldi 2003 falls entirely within the coenological range of *Pino-Quercion congestae* for which it can be considered a later syntaxonomical synonym.

SUB-ALLIANCE 1: *Pino-Quercenion congestae* suball. nov hoc loco

Typus: *Vicio cassubicae-Quercetum cerridis* Brullo & Marcenò 1985

Pino-Quercenion congestae brings together the acidophilous and sub-acidophilous *Quercus congesta* woods of the sub-mountain and mountain belts of Sicily and Aspromonte. These woods are frequently in upper serial contact with *Geranio-Fagion* beech woods and lower serial contact with the termophilous communities of the *Pino-Quercion* alliance or with *Erico-Quercion ilicis* woods. The communities of *Pino-Quercenion congestae* are dominated by deciduous oaks (*Q. congesta-Q. dalechampii*) and characterised by the presence of numerous nemoral mesophilous species (*Arabis turrita, Polystichum setiferum, Ilex aquifolium, Melica uniflora, Viola reichenbachiana, Geranium robertianum* etc.). The acidophilous substrate favours the growth of *Castanea sativa* and other important species of the *Quercus* genus (*Quercus gussonei, Q. leptobalana, Q. cerris*). In synchorological terms, the presence in the sub-alliance of various endemic species of Sicily and southern Calabria restricts its distribution

area to Sicily and southern Italy - although future investigations in Calabria, Basilicata and southern Campania will be able to determine the distribution area of this syntaxon with more precision.

In syntaxonomical terms, *Pino-Quercenion congestae* is the typical sub-alliance of the alliance and it also includes the major part of *Quercenion dalechampii* (nom. inv. Art. 5).

CHARACTERISTIC SPECIES: *Quercus dalechampii, Quercus congesta, Pinus nigra* subsp. *calabrica, Rubus aetnicus, Scutellaria columnae subsp. gussonei, Symphytum gussonei.*

TRANSGRESSIVE AND DIFFERENTIAL SPECIES: *Quercus leptobalana, Quercus fontanesii, Quercus gussonei, Hypochoeris laevigata, Conopodium capillifolium.* In addition (*Daphne laureola* e *Castanea sativa*), which are mesophilous species of the *Querco-Fagetea* class, can also assume a differential role with respect to *Quercenion virgilianae.*

SUB-ALLIANCE 2: *Quercenion virgilianae* suball. nov hoc loco

Holotypus hoc loco design.: *Celtido aetnensis-Quercetum virgilianae* Brullo & Marcenò 1985

The sub-alliance *Quercenion virgilianae* describes the termophilous and moderately basiphilous communities of *Pino-Quercion congestae*. This is the reason why within the alliance are to be found various species of the *Quercetea ilicis* class (typical of meso-Mediterranean thermotypes and, locally, upper thermo-Mediterranean and, more sporadically, supra-Mediterranean

Quercenion virgilianae is frequently to be found in lower serial contact with *Pistacio-Rhamnetalia alaterni* communities and in upper serial contact with *Quercion ilicis* woods (in places where soils are poorly developed) or, more rarely, with *Pino-Quercenion congestae* communities (in places where there is a lithomorphological discontinuity). Some doubts remain about two *Quercenion virgilianae* communities: first, *Oleo-Quercetum virgilianae* is probably a woody shrubland occurring in areas which have experienced fires, with a dominance of *Pistacio-Rhamnetalia* species (for cases such as this in central Italy (Blasi & Di Pietro, 1998) it has been decided to use the simpler rank of "community type"); second, *Lauro-Quercetum virgilianae* is rather heterogeneous (the last three relevés of the original Table in Brullo, Costanzo *et al.*, 2001, which are defined as a *Mespilus germanica* sub-association, display a clear dominance of *Quercus virgiliana* and as a consequence they could form a variant or laurel sub-association of *Mespilo-Quercetum virgilianae*. In synchorological terms, the current distribution area of *Quercenion virgilianae* is restricted to Sicily and southern Calabria. Nevertheless, it is possible that this sub-alliance is also present in various coastal and sub-coastal Tyrrhenian areas (Cilento National Park, Sorrento Peninsula, Aurunci mountains), the Neapolitan islands (Ischia, Capri) and the Pontine archipelago (Ponza).

CHARACTERISTIC SPECIES: *Quercus virgiliana, Clematis cirrhosa, Acanthus mollis, Origanum heracleoticum.*

TRANSGRESSIVE AND DIFFERENTIAL SPECIES: *Rhamnus alaternus, Pistacia lentiscus, Olea europaea.*In addition, many other species of *Pistacio-Rhamnetalia alaterni* (*Pistacia lentiscus, Myrtus communis, Euphorbia dendroides* etc.) assume a differential role with respect to *Pino-Quercenion congestae.*

The following associations belong to this sub-alliance:

ALLIANCE 4: *ERYTHRONIO-QUERCION-PETRAEAE* Ubaldi (1988) 1990

Typus: *Physospermo cornubiensis-Quercetum petraeae* Oberdorfer & Hofmann 1967

DIAGNOSIS: Belonging to this alliance are the chestnut and mesophilous and acidophilous oak woods of the hilly and sub-montane belts and the *Quercus* and *Carpinus* woodlands developed on slopes and which cannot be included in *Carpinion betuli*, and *Quercion robori-petraeae*. These communities are typical of substrates which are mainly arenaceous or marly arenaceous, but they can also be found on flysch and on neutral or acidic vulcanites where however, a dominant role is played by *Quercus petraea* in the woodland canopy. The distribution area of this alliance is restricted to the Ligurian, Tuscany and Emilia-Romagna, with local occurrencies in Umbrian and Marches Apennines. The southern limit of *Erythronio-Quercion* (southern Tuscany) coincides with the southern limit of the distribution area of individual species such as *Erythronium dens canis, Physospermum cornubiense, Lathyrus montanus, Calluna vulgaris* and *Teucrium scorodonia* more or less occurs. In particular, *Physospermum cornubiense*, a species which is abundant in the termophilous *Quercus cerris* woodlands of the Balkans, assumes particular chorological relevance. This attests to the existence of an interesting link with the south-eastern European biogeographical sector at the level of mesophilous Oak woods, in addition to the recently recognised link at the level of beech woodlands (Biondi, Casavecchia *et al.*, 2002; Di Pietro *et al.*, 2003). Southwards *Erythronio-Quercion* gives way to *Teucrio siculi-Quercion cerridis*. In

Liguria, *Quercus cerris* woods growing on deep, clayey soils may host, as a function of the soil pH, typically acidophilous species such as *Genista germanica, Lathyrus montanus, Teucrium scorodonia, Viola canina, Quercus petraea, Pteridium aquilinum*, or (less frequently) calcicolous species such as *Ostrya carpinifolia, Sesleria autumnalis, Sorbus aria, Cytysus sessilifolius* etc (Barbero *et al.*, 1972).

Erythronio-Quercion petraeae woods are dynamically linked to *Berberidion* shrubby communities, with transgressive acidopholous species of the *Cytisetea scopario-striati* or *Calluno-Ulicetea* (Aubert *et al.*, 1971; Casini *et al*., 1995; Arrigoni, 1998; Arrigoni & Viciani, 2001). Communities occurring on, or near, valley floors are enriched with meso-hygrophilous species of *Populion albae* and have shrubby edges composed of species of the *Franguletea* (sensu Weber, 1998) class.

CHARACTERISTIC SPECIES: In Ubaldi *et al.* (1990) the characteristic species of the alliance *Erythronio-Quercion petraeae* were indicated as *Anemone trifolia var. italica, Sesleria cylindrica, Phyteuma michelii, Luzula pedemontana, Deschampsia flexuosa, Veronica urticifolia, Ranunculus nemorosus, Ornithogalum pyrenaicum*. These species had already been considered as differentials of what had been defined as the "*Anemone trifolia* group of associations". In Ubaldi, (1995) a proposal for a reduced number of differentials for the alliance was made, consisting of just four species: *Quercus petraea, Physospermum cornubiense, Lathyrus montanus,* and *Erythronium dens canis.* Seeing that from the coenological and distributional standpoints almost all the communities of the order *Lathyro nigri-Quercetalia cerris* (not recognised in the present study) correspond to *Erythronio-Quercetum petraeae*, the following group of characteristic and differential species for *Erythronio-Quercion petraeae* is proposed here:

CHARACTERISTIC SPECIES: *Physospermum cornubiense, Genista germanica, Lathyrus montanus, Polygonatum odoratum, Helleborus viridis, Erythronium dens canis, Luzula pedemontana, Helleborus odorus subsp. laxus*.

TRANSGRESSIVE AND DIFFERENTIAL SPECIES: *Quercus petraea, Anemone nemorosa, Populus tremula, Platanthera clorantha, Dactylorhiza maculata, Listera ovata, Luzula sylvatica, Anemone trifolia, Deschampsia flexuosa, Iris graminea, Pinus sylvestris, Genista pilosa, Phyteuma michelii, Teucrium scorodonia*.

SYNTAXONOMICAL DISCUSSION: The alliance *Erythronio-Quercion cerridis* was validly described in Ubaldi 1988, where the nomenclatural type (*Physospermo cornubiensis-Quercetum pe*traeae Oberdorfer & Hofmann 1967) was indicated as corresponding to a validly described association and direct reference was made to another study (Ubaldi *et al.*, 1990) in which the characteristic species were listed (Art 8). The subsequent typfication performed in Ubaldi (1995) is therefore to be considered superfluous. It needs to be stressed, however, that the heterogeneity present in the original table of *Physospermo-Quercetum petraeae* (which leads Ubaldi (1995) to divide this association into three further different associations) indicates that this community is to be placed in the most mesophilous fringe of *Erythronio-Quercion petraeae* woodlands. Indeed in a recent study, Biondi *et al.* (2002) assigned the association *Physospermo-Quercetum petraeae* - which is also the nomenclatural type of *Erythronio-Quercion petraeae* - to the suballiance *Asparago tenuifolii-Carpinenion betuli* which was included in *Erythronio-Carpinion* and *Fagetalia*. It is worthnoting, however, that the group of relevés taken from Oberdorfer & Hofmann (1967) original table of *Physospermo-Quercetum petraeae* by Biondi et al. (2002) in order to include this community to *Asparago-Carpinenion* (*Erythronio-Carpinion*) was effectly the most appropriate to respect the original diagnosis of *Physospermo-Quercetum petraeae* made in Oberdorfer & Hofmann who indicated *Carpinion betuli* and *Fagetalia sylvaticae* as the higher rank syntaxa in which the association had to be included. Nevertheless, among this group of relevés does not included the lectotype of *Physospermo-Quercetum petraeae* (rel. 3, Tab. 1) which was indicated in Ubaldi (1995). This type-relevée, together with other relevés occurring in the same phytosociological table (Tab. 1) were, on the contrary, mainly linked to a *Quercetalia pubescenti-petraeae* environmental context, and, as a consequence in accordance to the diagnosis of *Erythronio-Quercion petraeae* made in Ubaldi 1988.

Owing to the marked mesophilous nature of the woodland communities which belong to it, to the almost total absence from it of Mediterranean species and also to its tendency to occur on acidic soils, *Erythronio-Quercion petraeae* is to be placed in the transition belt between *Carpinion betuli* (or *Erythronio-Carpinion*) and *Quercion robori-petraeae* (cfr. also Stortelder *et al.*, 1986).

ALLIANCE 5: *QUERCION PUBESCENTI-PETRAEAE* Br.-Bl. 1932

Typus: *Lithospermo-Quercetum petraeae* Br.-Bl. 1932

sub-alliance: *Buxo-Quercenion pubescentis* Zólyomi & Jakucs *ex* Jakucs 1960

Typus: *Buxo-Quercetum pubescentis* Br.-Bl. (1931) 1932

DIAGNOSIS: In Europe the alliance *Quercion pubescenti-petraeae* occurs over a wide area, which includes southern extra-Mediterranean and south-eastern France, northern Spain and stretches across to southern Switzerland, to the Illyric parts of Italy, as well as to the more arid parts of the Vienna basin and those parts of Hungary and southern Slovakia which border on to it. In Italy *Quercion pubescenti-petraeae* occurs mainly in the inner valleys of the southern slopes of the Alps, mainly in their western side, where a low degree of rainfall occurs (cfr. Montacchini, 1972). In peninsular Italy *s.s.*, *Quercion pubescenti-petraeae* is restricted to the Ligurian-Piedmont Apennine, while it should be more abundant within Alps southern slopes. *Quercion pubescenti-petraeae* woods exhibit typically xeromorphic features and are located on sub-montane and lower mountain belts, mainly on south-facing slopes and clearly affected by sub-continental bioclimate (Klika, 1938; Braun-Blanquet *et al.*, 1951; Archiloque *et al.*, 1970; Béguin & Theurillat, 1984; Chytrý, 1997). Substrates tend to be calcareous (compact limestone, marly limestone or calcarenites), or less frequently, siliceous. The soils are often shallow rendzinas and more rarely calcareous brown soils. In extremely dry habitat *Quercion pubescenti-petraeae* may have the appearence of an open shrubby woodland with a species-rich shrubby and field layers. These woodlands usually form small patches restricted to the warmest and dryest habitats being surrounded by mesophilous woodland communities where deeper soils and more mesophilous conditions occur. The most frequent species of the shrub layer are *Amelanchier ovalis, Buxus sempervirens, Prunus spinosa, Coronilla emerus, Cytisus sessilifolious,* and *Viburnum lantana*) while in the field layer, species coming from nitrophilous edges (*Geranium sanguineum, Clinopodium vulgare, Trifolium alpestre, Fragaria vesca*), and from xerophilous grasslands and garrigues (*Carex humilis, Polygala chamaebuxus, Teucrium chamaedrys* etc.) prevail. Dynamical contacts are with *Berberidion* shrublands while geoserial contacts are with *Erithronio-Quercion, Carpinion betuli, Carpinion orientalis* and *Quercion robori-petraeae* woods. *Quercion pubescenti-petraeae* is restricted to continental or sub-continental bio-climates; thermotypes are ranging from upper-hilly to lower-mountane. The umbrotype ranges from upper-dry to lower-subhumid.

CHARACTERISTIC SPECIES: *Buxus sempervirens, Amelanchier ovalis, Carex humilis, Catananche coerulea, Cotoneaster nebrodensis, Melica nutans, Primula veris.*

TRANSGRESSIVE AND DIFFERENTIAL SPECIES: *Hypericum montanum, Vincetoxicum hirundinaria, Primula elatior, Astragalus monspessulanum.*

SYNTAXONOMICAL BACKGROUND: The name *Quercion pubescentis* appeared in Braun-Blanquet, 1931, but its characteristic species were listed in the *Quercion pubescenti-petraeae* sensu Braun-Blanquet, 1932. *Quercion pubescenti-petraeae* was intended from the outset as an alliance of the Iberian Peninsula and Provence. It is difficult to differentiate characteristic species for it because many of the species which were considered as such in the original publication are, in fact, shared among various other alliances that are referrable both to forest and to shrub communities. According to Wallnöfer *et al.*, (1993) *Quercion pubescenti-petraeae* is identifiable by means of a typical mixture of south-western and sub-continental taxa. In Jakucs (1960; 1961) the name *Quercion petraeae* is proposed as a substitute (pro parte) for the old *Quercion pubescenti-petraeae*. In Jakucs (1960) the alliance *Buxo-Quercion pubescentis* (*Orno-Cotinetalia*) was described as referring to the sub-Mediterranean xerothermic Oak woods of Spain, of southern France and of those parts of western Italy most influenced by the relatively "sub-oceanic" bioclimate. The remainder of the xerothermic Oak woods in the Italian Peninsula, instead, were placed in *Carpinion orientalis* (*Ostryo-Carpinion*). Subsequently, *Buxo-Quercion* was included again as a sub-alliance within *Quercion pubescenti-petraeae* and it was in the form of this sub-alliance that it was identified in Spain (cfr. Rivas-Martínez, 1972; Rivas-Martínez *et al.*, 2001) and in other parts of Europe.

SYNTAXONOMICAL DISCUSSION: In the Italian Peninsula s.s. *Quercion pubescenti-petraeae* is present in the Ligurian Apennines in the form of xeromorphic communities, or as semi-rocky forest vegetation such as *Buxo-Quercetum pubescentis* and *Pino-Quercetum pubescentis* typical of areas where a sub-continental bioclimate prevails. Ubaldi (1988) defines the alliance *Cytiso-Quercion pubescentis* for arid-steppic *Quercus pubescens* woods occurring on marly-areneceous substrates of those hilly and sub-montane areas where some continental influence is also felt. This alliance had a syn-distribution area restricted to the Umbrian and Marches Apennines and, in part, also the Emilian

Apennines. Subsequently Ubaldi (1995) declassed *Cytiso-Quercion* to *Cytiso-Quercenion pubescentis* placing it within *Carpinion orientalis*. However, *Quercus pubescens* woodlands of the sub-continental Ligurian-Piedmontane Apennines are not easily includable within *Carpinion orientalis*, because in the Italian Peninsula this alliance coincides with oceanic and sub-oceanic bioclimates. The physiognomical-structural characteristics of these woods, restricted as they are to sites experiencing marked summer drought (which can also be accentuated by substrates) coupled with significant and prolonged winter cold-stress, suggest that they would be more suitably placed within *Quercion pubescenti petraeae*. In the central Apennines *Quercus pubescens* woodlands the Illyric-Balkan component is very abundant and exhibit species which are typically lacking from northern Italy (*Acer obtusatum, Chamaecytisus spinescens, Sesleria autumnalis, Carpinus orientalis* ecc.) and which lead to include these woodlands in *Carpinion orientalis* alliance. In the Italian Peninsula *Quercion-pubescenti petraeae* probably occurs only through the suballiance *Buxo-Quercenion.* In a European context *Quercion pubescenti petraeae* should be sought in the xerothermic deciduous forests of central and eastern Europe. *Buxo-Quercenion*, on the other hand, occupies the southern part of the syn-distribution area of this alliance which, even if it exhibits bioclimatic features which could be interpreted as sub-continental, is still marginally under the influence of the Mediterranean climate. The differential species of *Buxo-Quercenion* are the same of *Quercion pubescenti-petraeae*.

Life forms and Chorological analysis

Observing the histograms of the most frequent species in the different life form categories, the general sub-Mediterranean features of *Quercetalia pubescenti-petraeae* woodlands become apparent. Within the scapose phanerophytes group (Fig. 10) a significant dominance emerges for the south-eastern European component (*Fraxinus ornus, Ostrya carpinifolia, Quercus cerris, etc.*). *Fraxinus ornus* exhibits a wide ecological amplitude which results in it being found in about 90% of *Quercetalia* phytosociological associations – with an average frequency value per association which approaches 80%. Also of interest in Fig. 10 is the behaviour of *Carpinus orientalis*. Although this species occurs in less than 30% of the plant community types examined, it shows very high average frequency values compared to those of the adjacent woody species in the histogram. This same behaviour is also displayed, even if to a lesser extent, by species such as *Corylus avellana, Quercus petraea* and *Acer obtusatum*.

The occurrence of *Quercus ilex* in about an half of the associations considered (with an average frequency of 55%) is clear evidence of the influence of the Mediterranean climate in many parts of the Italian Peninsula, whereas the widespread occurrence of *Hedera helix* is a sign of the general sub-oceanic character of *Quercetalia pubescenti-petraeae* woodlands in peninsular Italy.

As regards scrubby species, most of those which occur in *Quercetalia pubescenti petraeae* woodlands belong to *Prunetalia spinosae*. In addition to wide-distribution species such as *Crataegus monogyna, Prunus spinosa, Clematis vitalba, Euonymus europaeus*, there are other species such as *Asparagus acutifolius, Rubia peregrina, Rosa sempervirens, Lonicera etrusca, Cytisus sessilifolius, Rubus ulmifolius, Coronilla emerus* which belong to relatively termophilous alliances (*Cytision sessilifolii, Pruno-Rubion ulmifolii*), or which are widely shared with *Quercetea ilicis* stands. The shrubland component linked to *Berberidion*, instead, appears to be somewhat sporadic and is restricted to *Juniperus communis*. As far as the grass layer is concerned, a typical mixture of mesophilous Eurasiatic species (*Brachypodium sylvaticum, Dactylis glomerata, Melica uniflora, Primula vulgaris etc.*) and relatively termophilous south-eastern European species (*Cyclamen hederifolium, Lathyrus venetus, Viola alba* subsp. *denhahrdtii*), is observable. With the exception of *Ruscus aculeatus*, which occurs in abundance, the entire Chamephyte component plays a minor role in the woodland communities – as does the Therophyte component.

Observing the general Floristic spectrum regarding the *Quercetalia pubescenti-petraeae* woodlands of peninsular Italy, which was drawn up on the basis of all phytosociological tables published to date, three main chorological components are apparent: Mediterranean (Stenomedit. + Eurimedit.); European-Eurasiatic; South-eastern European. Given that the major role in the woods' dominant layer is frequently played by species which exhibit their current centre of distribution in the Balkan area (*Ostrya, Fraxinus ornus, Quercus cerris, Carpinus orientalis...*), the south-eastern European component increase significantly when frequency values, as opposed to presence values, are considered (Fig. 11). The opposite is the case, however,

when Mediterranean species are considered, as these show a net decrease in frequency values. This indicates how the Mediterranean component occurring in *Quercetalia pubescenti petraeae* woodlands, while it plays an important biogeographical role, plays a minor physiognomical one.

The various alliances and sub-alliances that have been recognized for the Apennines exhibit chorological features which seem to be appropriate to their individual distribution areas. In fact the endemic component occurs mainly in those syntaxa having a southern Italian distribution, such as *Pino-Quercion congestae* (> 10 %) or *Ptilostemo-Quercenion cerridis*. The same is the case regarding southern Europe orophytes and stenomediterraneans (which are also particularly abundant in *Lauro-Quercenion pubescentis*). The highest values for south-eastern European and Eurimediterranean components are found in *Lauro-Quercenion pubescentis* - the most termophilous fringe of *Carpinion orientalis* in Italy.

Erythronio-Quercion petraeae is dominant in both the Boreal and the European-Caucasian chorological forms, while it is exceeded only by *Campanulo-Ostryon* (extreme western fringe of *Carpinion orientalis*) in the Atlantic and European chorological forms.

As to be expected from their synecological and synchorological features, *Teucrio-Quercenion cerridis* assumes an intermediate position in just about all the chorological categories. The same can be said for *Laburno-Ostryenion* which, since it is mainly composed of mesophilous hop hornbeam woodlands, exhibits high values of the South-eastern Eropean and the Eurasiatic components.

The cosmopolitan component (which is not shown in the histograms) is very low, ranging from just 2% to 3.8%.

Conclusions

From this study it emerges that most of the deciduous woods occuring in the Italian Peninsula and which can be placed in *Quercetalia pubescenti-petraeae* belong to two main alliances, of which one (*Carpinion orientalis*) has an amphi-Adriatic distribution area while the other (*Teucrio-Quercion*) is endemic to the central-southern Apennines.

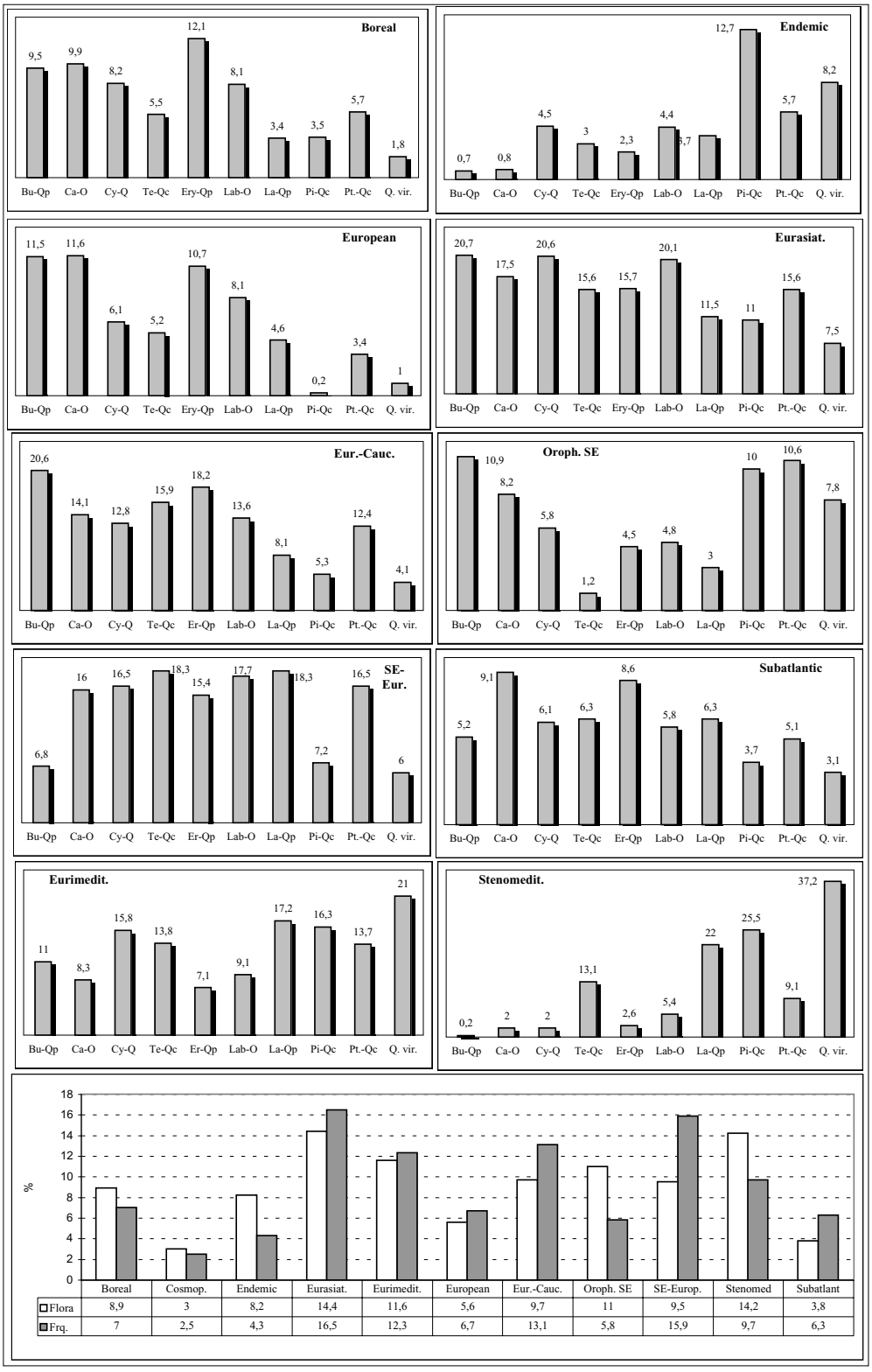
This result clearly reflects the bioclimatic characteristics of the Italian Peninsula, which owing to the relative proximity of the Tyrrhenian and Adriatic Seas experiences almost everywhere a fairly pronounced oceanic influence and considerable penetration of the Mediterranean and sub-Mediterranean biocora. In particular *Teucrio-Quercion cerridis* (proposed here as a nomen conservandum) is reassessed as an autonomous, endemic alliance having high synecological and synchorological amplitude, to be considered as geo-vicariant of *Quercion frainetto* (central Balkans) and *Melittio-Quercion frainetto* (south-western Balkans and Greece). This confirms, on the one hand, that strong biogeographical links exist between the Italian Peninsula and the lands lying to the east of the Adriatic Sea, and on the other hand that the oak woodland vegetation of the Apennines has a degree of uniqueness and autonomy similar to that already demonstrated for beech woodlands (cfr. Gentile, 1970; Di Pietro *et al.* 2004 in press) with the alliance *Geranio-Fagion*.

Underlining the importance of the *Quercus cerris* woods in the Peninsula is the recognition of another alliance, *Erythronio-Quercion petraeae*, endemic to the northern Apennines. This alliance (which is composed also of several Turkey oak woods) can still be placed within *Quercetalia pubescenti-petraeae*, but is characterised bioclimatically by an almost complete absence of Mediterranean influence and physiognomically by a significant role for *Q. petraea*.

On the basis of what was proposed in Soó (1963), Wallnöfer *et al.* (1993) e Chytrý (1997) for *Quercetalia pubescenti-petraeae* woodlands in their respective countries, *Erythronio-Quercion* can be considered a southern-European geo-vicariant of central and eastern European *Quercion petraeae*. The distribution area of *Erythronio-Quercion petraeae* centres on the northern Apennines and moving northwards it is progressively substituted by communities of *Carpinion betuli*, *Erythronio-Carpinion*, *Quercion robori petraeae* and *Quercion pubescenti-petraeae* which take on a zonal significance. Finally, it is worth noting that an Apennine woodland coenological space has been maintained within *Buxo-Quercenion* - a sub-alliance which has sub-Mediterranean characteristics - for xerothermic *Quercus pubescens* woods, which have sub-continental characteristics and can be placed within *Quercion pubescenti-petraeae*.

The syntaxonomical framework of the oak woods of Sicily and southern Calabria at the rank of alliance and suballiance could in future be subject to significant changes as a result of further and more detailed investigations and the debates currently under way concerning the taxonomy of the genus *Quercus*. Obviously, if Brullo et al. (1999) proposal concerning

Fig. 10 - Species frequency values calculated considering the entire set of *Quercetalia pubescenti petraeae* woodlands association described at present (line), and species average frequency calculated only in those phytosociological associations in which the species effectively occur (columns). This mixed hystogram considers the 20 main species belonging to scapose Phanerophytes (a), nano-Phanerophytes (b); Geophytes (c); Hemycryptophytes (d). As regards Chamaephytes (e) and Therophytes (f) life forms, only ten species were selected because of the minor role these two life form categories play in woodland environments



	Boreal	Cosmop.	Endemic	Eurasiat.	Eurimedit.	European	Eur.-Cauc.	Oroph. SE	SE-Europ.	Stenomed	Subatlant
Flora	8,9	3	8,2	14,4	11,6	5,6	9,7	11	9,5	14,2	3,8
Frq.	7	2,5	4,3	16,5	12,3	6,7	13,1	5,8	15,9	9,7	6,3

Fig. 11 - Chorological features of the various alliances and sub-alliances, based on the frequency values of the chorotypes in each syntaxon and (at the bottom) general chorological features of Italian Peninsula *Quercetalia pubescenti-petraeae* woodlands based on the entire set of phytosociological associations listed in the synoptic tables

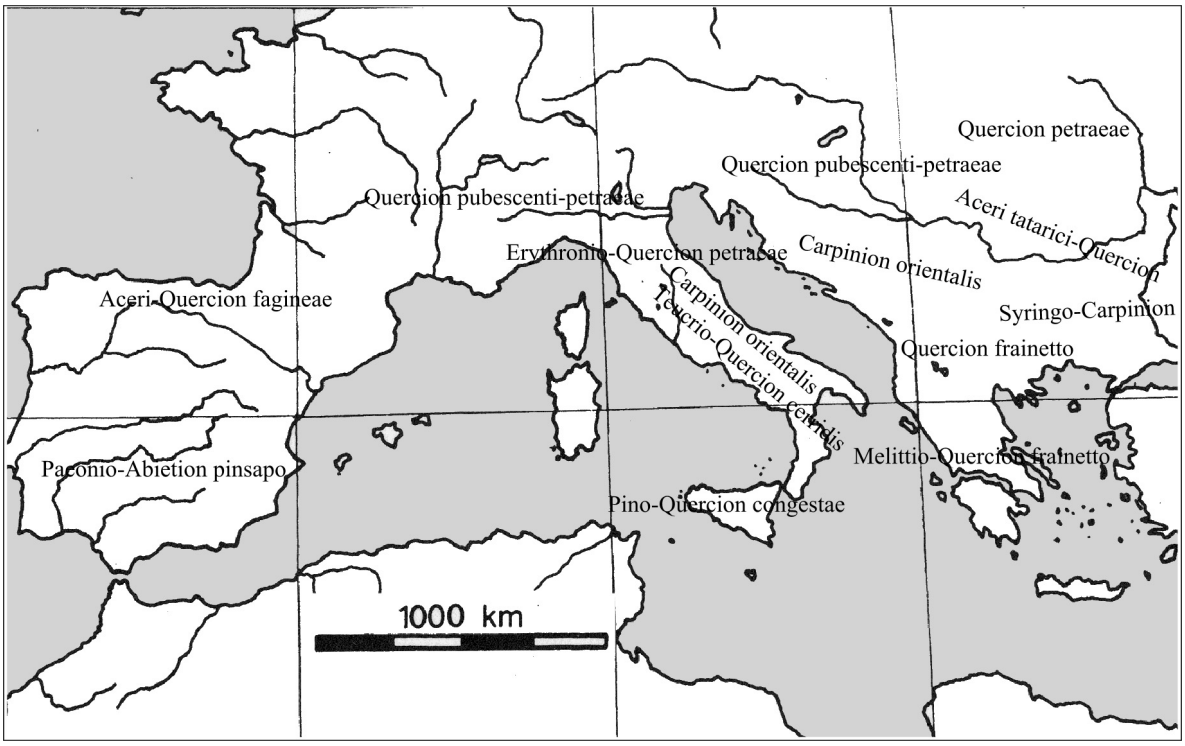


Fig. 12 - Provisional scheme of the distribution of the main *Quercetalia pubescenti-petraeae* alliances in south-eastern Europe

the taxonomy of southern Italian oaks is accepted (after appropriate territorial survays) for the entire Italian Peninsula, this would have repercussions of a syntaxonomical kind, too. On the basis of the information at present available in literature, it is not easy to make comparisons between oak woods of the Peninsula and those of Sicily. Under the syntaxonomical scheme which is being proposed here, the oak woods of southern Calabria and Sicily exhibit a clear autonomy which is due to distinctive chorological and bioclimatic features, as well as to floristic characteristics. Obviously, if it were to be established that *Q. fontanesii, Q. gussonei, Q. leptobalana,* or other slightly better-known species such as *Q. virgiliana, Q. dalechampii* or *Q. amplifolia* are present and frequent not only in Sicily, but also in the south of the Italian Peninsula, then the autonomy of *Pino-Quercion congestae* would have to be rediscussed, especially in relation to *Teucrio-Quercion cerridis*. In fact, several of the characteristic species of *Teucrio-Quercion* are to be found in Sicily and it could therefore be hypothesised that a wider *Ptilostemo-Quercenion cerridis* is also present on the island, which could include those low-altitude oak woods which are strictly linked to soil parameters.

Acknowledgements

The authors are indebted to Dr. Jean Paul Theurillat for his help in nomenclatural issues and to Leonardo Rosati, Goffredo Filibeck, Giandomenico Presti, for their assistance and comments. The English of the final version was corrected by Jim Mc Manus.

This publications was supported by the project "Completamento delle Conoscenze naturalistiche di base (Completion of Base Ecological Information in Italy), funded by the Italian Ministry of Environment) and with the financial support from the Ministry of Education, University and Research of the Italian Government, under the programme PRIN 2003 FOR_BIO "Sustainable management models for the conservation of the complexity and biological diversity of forest ecosystems" (project leader: O. Ciancio).

Syntaxonomical scheme

QUERCO-FAGETEA Br.-Bl. & Vlieger *in* Vlieger 1937

QUERCETALIA PUBESCENTI-PETRAEAE *KLIKA 1933* CORR.
[*Lathyro nigri-Quercetalia cerridis* Ubaldi 1988 nom. inv. art. 5 p.p.; *Quercetalia humili-petraeae* Klika 1933 nom. mut., nom. illeg. Art. 45 sec. Ubaldi 2003); *Carpino-Melicetalia* Ubaldi in Ubaldi, Puppi, Speranza & Zanotti 1986: nom. inval. Art. 8; *Lathyro veneti-Carpinetalia* Ubaldi, Zanotti, Puppi, Speranza, Corbetta 1990 synt. syn p.p.; *Querco-Fagetalia* Ubaldi 2003 synt. syn. p.p.]

❑ *Teucrio siculi-Quercion cerridis* Ubaldi 1988 (nom. conserv. propos. hoc loco)
(HOLOTYPUS HOC LOCO DESIGN.: *Asplenio onopteris-Quercetum cerridis* Ubaldi 1995).
[*Lonicero etruscae-Quercion pubescentis* Arrigoni & Foggi *ex* Arrigoni, Mazzanti & Ricceri 1990 nom. inv. Art. 8; *Teucrio siculi-Quercion cerridis* Ubaldi 2003: nom. illeg. Art. 29c; *Mespilo-Carpinion betuli* Ubaldi 2003 nom. inv. Art 8; *Crataego laevigatae-Quercion cerridis* Arrigoni 1997; *Lathyro montani-Quercion cerridis* Scoppola & Filesi 1998; *Melittio-Quercion frainetto* Barbero & Quézel 1976 p.p; *Quercion cerris* Avena & Bruno 1975 nom. inval. art. 3b]

➢ *Teucrio siculi-Quercenion cerridis* Blasi, Di Pietro & Filesi suball. nov. hoc loco
(HOLOTYPUS HOC LOCO DESIGN.: *Asplenio onopteris-Quercetum cerridis* Ubaldi 1995).

➢ *Ptilostemo stricti-Quercenion cerridis* Bonin & Gamisans 1977
(HOLOTYPUS: *Lathyro digitati-Quercetum cerridis* Bonin & Gamisans 1977).

❑ *Pino calabricae-Quercion congestae* Brullo, Scelsi, Siracusa & Spampinato 1999
(HOLOTYPUS: *Vicio cassubicae-Quercetum cerridis* Brullo & Marcenò 1985).
[= *Festuco exaltatae-Quercion humilis* Ubaldi 2003: synt. synon.; *Erico-Quercion ilicis* Brullo, Di Martino & Marcenò 1985 p.p.]

➢ *Pino calabricae-Quercenion congestae* Blasi, Di Pietro & Filesi suball. nov. hoc loco
(HOLOTYPUS: *Vicio cassubicae-Quercetum cerridis* Brullo & Marcenò 1985).
[*Quercenion dalechampii* Brullo 1984 nom. inv. Art. 5;]

➢ *Quercenion virgilianae* Blasi, Di Pietro & Filesi suball. nov. hoc loco
(HOLOTYPUS HOC LOCO DESIGN.: *Celtido australis-Quercetum virgilianae* Brullo & Marcenò 1985.)
[*Erico-Quercenion ilicis* Brullo, Di Martino & Marcenò 1977 p.p.]

❑ *Carpinion orientalis* Horvat 1958
(LECTOTYPUS HOC LOCO DESIGN.: *Carpinetum orientalis croaticum* Horvatić 1938).
[=*Carpinion orientalis* Horvat 1954 nom. inv. (Art. 5) ; *Ostryo-Carpinion orientalis* Horvat 1959; *Carpinion orientalis* Lakusic, Pavlovic, Redzic 1982 nom. illeg. art. 31; *Laburno-Ostryon* Ubaldi 1980 nom invalid. Art. 5; *Laburno-Ostryon* Ubaldi 1995 synt. syn.; *Crataego laevigatae-Quercion cerridis* Arrigoni 1997 p.p.: synt. syn.; *Lonicero etruscae-Quercion pubescentis* Arrigoni in Arrigoni, Mazzanti & Ricceri 1990 p.p.: synt. syn.]

➢ *Laburno anagyroidis-Ostryenion carpinifoliae* (Ubaldi 1995) Blasi, Di Pietro & Filesi stat. nov. hoc loco
(HOLOTYPUS: *Ostryo-Aceretum opulifolii* Ubaldi 1995).
[Basion. : *Laburno-Ostryon* Ubaldi 1995; *Laburno-Ostryenion* Poldini 1988 nom. inval. Art. 5; *Ostryo-Carpinenion* Lausi, Gerdol & Piccoli 1982 p.p.: nom. inval. Art. 5]

➢ *Lauro nobilis-Quercenion pubescentis* Ubaldi 1995
(HOLOTYPUS: *Asparago acutifolii-Ostryetum carpinifoliae* Biondi *ex* Ubaldi 1995.

[*Laburno-Ostryenion* sensu Poldini 1988 nom. inval. Art. 5 p.p.; *Ostryo-Carpinenion* sensu Lausi, Gerdol & Piccoli 1982: nom. inval. Art. 5, p.p.]

➢ *Campanulo mediae-Ostryenion carpinifoliae* Ubaldi 1995
(HOLOTYPUS: *Plagio-Ostryetum* Gruber 1968).

➢ *Cytiso sessilifolii-Quercenion pubescentis* Ubaldi 1995
(HOLOTYPUS: *Peucedano cervariae-Quercetum pubescentis* Ubaldi 1995).

Other sub-alliances of *Carpinion orientalis* occurring in Italy but non included in the study area

➢ *Ostryo-Carpinenion orientalis* Poldini 1982
(HOLOTYPUS: *Carpinetum orientalis croaticum* Horvatić 1934).
[*Ostryo-Carpinenion* Poldini 1988 nom. illeg. art. 22, *Ostryo-Carpinenion* (Horvat 1958) Ubaldi 2003 nom. illeg. art. 22]

➢ *Seslerio autumnalis-Ostryenion carpinifoliae* Blasi, Di Pietro & Filesi suball. nov. hoc loco
(Holotypus hoc loco design.: *Seslerio autumnalis-Ostryetum carpinifoliae* Horvat & Horvatić 1950).

➢ *Helleboro nigri-Ostryenion carpinifoliae* Ubaldi 2003
(HOLOTYPUS: *Helleboro-Ornetum* Antonietti 1960).
[*Orno-Ostryenion* Gerdol, Lausi, Piccoli & Poldini 1982 nom. inval. art. 5; *Seslerio coeruleae-Ostryenion carpinifoliae* Ubaldi 2003 syn syntax]

❑ *Quercion pubescenti-petraeae* Br.-Bl. 1932
(HOLOTYPUS: *Lithospermo-Quercetum pubescentis* Br.-Bl.1932).

➢ *Buxo-Quercenion pubescentis* Zólyomi & Jakucs *ex* Jakucs 1960
(HOLOTYPUS: *Buxo sempervirentis-Quercetum pubescentis* Br.-Bl. *ex* Bannes-Puygiron 1933).

❑ *Erythronio dens-canis-Quercion petraeae* Ubaldi (1988) 1990
(HOLOTYPUS: *Physospermo cornubiensis-Quercetum petraeae* Oberdorfer & Hofmann 1967).

References

Abbate G., Avena G.C., Blasi C. & Veri L., 1981. Studio delle tipologie fitosociologiche del M.te Soratte (Lazio) e loro contributo nella definizione fitogeografica dei complessi vegetazionali centro-appenninici. CNR, Collana P.F. “Promozione della qualità dell’Ambiente”, AQ/1/125.

Abbate G., Blasi C., Spada F. & Scoppola A., 1990. Analisi fitogeografica e sintassonomica dei querceti a *Quercus frainetto* dell’Italia centrale e meridionale. Not. Fitosoc. 23 (1987): 63-84.

Abbate G. & Paura B., 1995. Contributo alla conoscenza dei querceti supramediterranei e submontani della Calabria settentrionale. Ann. Bot. (Roma) 51 (Suppl. 10) (1) (1993): 19-28.

Abbate G. & Scagliusi E., 1995. I boschi submontani dei Monti Ernici (Appennino Centrale). Primo contributo su corologia e sintassonomia. Ann. Bot. (Roma) (1993) 51 (Suppl.10): 307-324.

Adamovic L. (1906). Uber eine bisher nicht unterschiedene Vegetations form d. Balkanhalbinsen die Pseudomacchie. Verh. zool. bot. Ges. Wien. 56.

Adamovic L. (1929). Die Pflnzenwelt der Adrialänder. Jena.

Aita L., Corbetta F. & Orsino F., 1974. Osservazioni preliminari sulle faggete e sulle cerrete dell’Appennino lucano. Not. Fitosoc. 9: 15-26.

Aita L., Corbetta F. & Orsino F., 1977. Osservazioni fitosociologiche sulla vegetazione forestale dell’Appennino

Lucano centro-settentrionale (I° Le cerrete). Arch. Bot. et Biogeogr. Ital. 53 (3/4): 97-128.

Alessandrini A. & Corbetta F., 1979. La copertura vegetale dei boschi di Carrega. Consorzio per la zona dei Boschi di Carrega, Documenti, 4, Parma.

Allegrezza M., Baldoni M., Biondi E., Taffetani F. & Zuccarello V., 2002. Studio fitosociologico dei boschi a *Quercus pubescens* s.l. delle Marche e delle zone contigue dell'Appennino centro settentrionale (Italia centrale). Fitosociologia 39 (1): 161-171.

Allegrezza M., Biondi E. & Ballelli S., 1997. La vegetazione dei settori rupestri calcarei dell'Appennino Umbro-Marchigiano e del litorale marchigiano centro-meridionale. Fitosociologia 32: 91-120.

Amaral Franco J. & Lopez Gonzales G., 1987. Notas referentes al genero *Quercus*. Anal. Jard. Bot. Madrid 44 (2): 555-558.

Anzalone B., 1996. Prodromo della Flora Romana (elenco preliminare delle piante spontanee del Lazio) (Aggiornamento). Parte 1 *Pteridophyta, Gymnospermae, Angiospermae Dicotyledones*. Ann. Bot. (Roma) 52 (suppl. 11) (1994): 1-81.

Anzalone B., 1998. Prodromo della Flora Romana (elenco preliminare delle piante spontanee del Lazio) (Aggiornamento). Parte 2, *Angiospermae Monocotyledones*. Ann. Bot. (Roma) 54 (1996): 7-47.

Archiloque A., Borel L., Devaux J.-P.,, Lavagne A., MoutteP. & Weiss H., 1970. Vers une caractérisation phytosociologique da la série méditerranéenne du chéne pubescent. Ann. Fac. Sc. Marseille 44: 17-42.

Arrigoni P.V., 1974. Ricerche sulle querce caducifoglie italiane 3. *Quercus frainetto* Ten. in Toscana. Webbia 29 (1): 87-104.

Arrigoni P.V., 1997. Documenti per la Carta della vegetazione delle Cerbaie (Toscana settentrionale). Parlatorea 2: 39-71.

Arrigoni P.V., 1998. La vegetazione forestale, Boschi e Macchie di Toscana. Regione Toscana, 215 pp.

Arrigoni P.V. & Foggi B., 1988. Il Paesaggio vegetale delle colline di Lucignano (Prov. di Firenze). Webbia 42 (2): 285-304.

Arrigoni P.V., Mazzanti A. & Ricceri C., 1990. Contributo alla conoscenza dei boschi della Maremma grossetana. Webbia 44 (1): 121-150.

Arrigoni P.V. & Viciani D., 2001. Caratteri fisionomici e fitosociologici dei castagneti toscani. Parlatorea 5: 55-99.

Aubert G., Barbero M., Loisel R., 1971. Les Callunaies dans le sud-est de la France et le nord-ouest de l'Italie. Bull. Soc. Bot. France 118: 679-699.

Avena G.C., Blasi C., Scoppola A & L. Veri, 1980. Sulla presenza di popolamenti ad *Ostrya carpinifolia* Scop. Inquadrabili nel ass. nova nelle Valli del F. Salto e del F. Fioio (Regioni Cicolana e Carseolana; Appennino Laziale-Abruzzese). Not. Fitosoc. 16: 53-64.

Avena G. & Bruno F., 1975. Lineamenti della vegetazione del massiccio del Pollino, Appennino calabro-lucano. Not. Fitosoc., 10: 131-158.

Ballelli S., Biondi E. & Pedrotti F., 1982. L'associazione *Scutellario-Ostryetum* dell'Appennino centrale. Excursion internationale de Phytosociologie en Italia centrale. Guide-Itinéraire: 565-569.

Barbero M. & Bono G., 1968. Principales divisions phytogéographiques des Alpes Maritimes et Ligures. Allionia 14: 153-166.

Barbero M. & Bonin G., 1969. Groupements végétaux de la carte de Vievola (Vièvе) au 1.50.000 (Alpes maritimes et Ligures). Webbia 23. 513-583.

Barbero M. & Bono G., 1970. La végétation sylvatique thermophile de l'étage collinéen des Alpes Apuanes et de l'Apennin ligure. Lavori della Soc. Ital. Biogeogr. n.s. 1: 148-182.

Barbero M., Gruber M. & Loisel R., 1971. Les forets caducifoliées de l'étage collinéen de Provence, des Alpes Maritimes et de la Ligurie occidentale. Annales de l'Université de Provence, Sciences 45 : 157-202.

Barbero M. & Loisel R., 1969. Essai de mise à jour de la systématique phytosociologique dans le Sud-Est de la France et le Nord-Ouest de l'Italie. Ann. Fac. Sci. Marseille 42. 87-95.

Barbero M., Loisel R. & Ozenda P., 1972. Répartition et écologie de *Quercus cerris* et *Quercus crenata* dans les Alpes maritimes et Ligures. Bull. Soc. Bot. France 119: 121-125.

Barbero M. & Quézel P., 1977. Les groupements forestiers de Geéce centro-méridionale. Ecol. Medit. 2: 3-85.

Beck-Managetta G. (1901). Die vegetationsverhaltnisse der Illyrischen Lander. In. Engler A. & Drude O. (eds.). Die Vegetation der Erde, 4; Engelmann, Leipzig.

Béguin C. & Theurillat J.-P., 1984. Quelques aspects du complexe des falaises rocheuses sur silice dans le Haut-Valais (Alpes, Suisse). Candollea 39 : 647-673.

Bennett K.D., Tzedakis C. & Willis K.J., 1991. Quaternary refugia of north European trees. Journal of Biogeography 18. 103-115.

Biondi E., 1982. L'*Ostrya carpinifolia* Scop. sul litorale delle Marche (Italia centrale). Studia Geobot. 2: 141-147.

Biondi E., 1986. La vegetazione di Monte Conero. Regione Marche, 94pp.

Biondi E., 1989. Il bosco nell'Appennino. Storia, vegetazione, ecologia, economia e conservazione del bosco appenninico. Centro studi Valleremita, 463 pp.

Biondi E. & Allegrezza M., 1996. Il paesaggio vegetale collinare anconetano. Giorn. Bot. Ital. 130 (1): 117-135.

Biondi E., Allegrezza M., & Guitian J., 1988. Mantelli di vegetazione nel piano collinare dell'Appennino centrale. Doc. Phytosoc. 11: 479-490.

Biondi E., Ballelli S., Allegrezza M. & Manzi A., 1990. La vegetazione dei Calcari di Gessopalena (Abruzzo meridionale). Doc. Phytosoc. 12: 257-263.

Biondi E., Brugiapaglia E. & Tedeschini-Lalli L., 1998. Indagine geobotanica sulla "Caldara di Manziana" (Italia centrale). Fitosociologia 35 (1): 65-76.

Biondi E., Calandra R., Gigante D., Pignattelli S., Rampiconi E. & Venanzoni R., 2002. Il Paesaggio vegetale della provincia di Terni. Arti Grafiche Iezzi, Terni: 1-103.

Biondi E., Casavecchia S., Pinzi M., Allegrezza M. & Baldoni M., 2002. The syntaxonomy of the mesophilous woods of the central and northern Apennines (central Italy). Fitosociologia 39 (2): 71-94.

Biondi E., Gigante D., Pignattelli S. & Venanzoni R., 2001. I boschi a *Quercus frainetto* Ten. presenti nei territori centro-meridionali della Penisola Italiana. Fitosociologia 38 (2): 97-111.

Blasi C., 1985 (b). *Quercus cerris* & *Quercus frainetto* woods in Latium (Central Italy). Ann. Bot. (Roma) 42 (1984): 7-19.

Blasi C., 1994. Fitoclimatologia del Lazio. Fitosociologia 27: 151-175.

Blasi C., Cavaliere A., Abbate G. & Scoppola A., 1992. I cespuglieti del comprensorio vulcanico cimino-vicano (Lazio, Italia centrale). Ann. Bot. (Roma) 48 (1990): 1-24.

Blasi C., Cutini M., Di Pietro R. & Fortini P., 2002. Contributo alla conoscenza *del Pruno-Rubenion ulmifolii* in Italia. Fitosociologia 39(1): 129-144.

Blasi C. & Di Pietro R., 1998. Two new phytosociological types of *Quercus pubescens* s.l. woodland community in southern Latium. Plant Biosystems 132 (3): 207-223.

Blasi C. & Di Pietro R., 2002. I boschi del Lazio Meridionale, crocevia di specie e comunità vegetali. *In:* Pro Montibus (Eds.), "I boschi degli Appennini tra tradizione e futuro": 61-75.

Blasi C., Di Pietro R. & Filesi L., 2002. Syntaxonomical revision of *Quercetalia pubescenti-petraeae* woodlands in the Italian Peninsula. International Symposium of Biodiversity & Phytosociology "abstracts": 61-62, Ancona.

Blasi C., Di Pietro R., Filesi L. & Fortini P., 2001. Syntaxonomy, chorology and syndynamics of *Carpinus orientalis* communities in Central Italy. Phytocoenologia 31 (1): 33-62.

Blasi C., Dowgiallo G., Follieri M., Lucchese F., Magri D., Pignatti S. & Sadori L., 1995. La vegetazione naturale potenziale dell'area romana. Accademia Nazionale dei Lincei (Atti dei Convegni Lincei) 115: 423-457.

Blasi C., Feoli E. & G.C. Avena, 1982. Due nuove associazioni dei *Quercetalia pubescentis* dell'Appennino centrale. Studia Geobotanica 2*:* 155-167.

Blasi C., Filesi L., Abbate G. & Cornelini P., 1990. La vegetazione forestale dei Monti Cimini (Italia centrale). Doc. Phytosoc., N.S., 12: 305-320.

Blasi C., Filesi L., Fratini S. & Stanisci A., 1997. Sintassonomia e sindinamica dei boschi con *Quercus suber* del distretto tirrenico laziale (Italia centrale). Ecologia Mediterranea 23 (3\4): 21-32.

Blasi C., Filesi L., Stanisci A., Frondoni R., Di Pietro R. & Carranza M.L., 2002b. Excursion to the Circeo National Park. Fitosociologia 40: 91-130.

Blasi C. & Paura B., 1995. Su alcune stazioni a *Quercus frainetto* Ten. In Campania ed in Molise. analisi fitosociologica e fitogeografica. Ann. Bot. (Roma) 51 (Suppl. 10) (2) (1993): 353-366.

Blasi C. & Michetti L., 2002. La Carta del Fitoclima d'Italia (scala 1: 250.000). International Symposium of Biodiversity & Phytosociology "abstracts": 106, Ancona.

Blasi C., Stanisci A., Filesi L., Milanese A., Perinelli E. & Riggio L., 2002a. Syndynamics of lowland *Quercus frainetto* & *Quercus cerris* forests in Lazio (central Italy). Fitosociologia 39 (1): 23-43.

Blečič V. & Lakušič R. (1967). Niederwald und buschwald der orientalischen hainbuche in Montenegro. Glasnik Botaničkog Zavoda i Baśte Univerziteta u Beogradu, 2 (1-4). 83-94.

Bonin G., 1978. Contribution à la connaisance de la végétation des montagnes de l'Apennin centro-meridional. Thèse d'Etat, Marseille.

Bonin G., 1980. Les groupements des *Querco-Fagetea* dans l'Apennin Lucano-Calabrais, leurs relations avec les sylves de l'Apennin central. Not. Fitosoc. 16 : 23-29.

Bonin G. Briane J.P. & Gamisans J., 1976. Quelques aspects des forets supraméditerranéennes et montagnardes de l'Apennin méridional. Ecol. Medit. 2, 101-***

Bonin G. & Gamisans J., 1976. Contribution a l'étude des forets de l'étage supramediterranéen de l'Italie méridionale. Doc Phytosoc. (Lille) 19-20: 73-88.

Bono G., Barbero M. & Ferrarini E., 1970. Le Alpi Apuane . i loro rapporti con le Alpi Marittime e Liguri, l'Appennino settentrionale, le Alpi orientali e Dinariche. Arch. Bot. (Forlì) 46 : 135-153.

Bozilova E. (1975). Correlation of the vegetational development and climatic changes in the Rila and Pirin mountains during the late glacial and post glacial time compared to other areas. In . Jordano D. et al. (eds.) . Problems of balkan Flora and Vegetation. Bulgar. Acad. of sc. (1973) . 64-71, Sofia.

Braun-Blanquet J., 1931. Aperçu des groupements végétaux du Bas-Languedoc. Commun.Stat. Int. Géobot. Médit.

Alpine Montpellier 9 : 35-40.

Braun-Blanquet J., 1932. Zur Kenntnis nordschweizerischer Waldgesellschaften. Beih. Bot. Centralbl. 49. Suppl. (Festchrift Drude): 7-42

Braun-Blanquet J., 1964. Pflanzensoziologie. 3rd ed. Springler, Wien-New York: 631 pp.

Braun-Blanquet J. & Pavillard J., 1922. Vocabulaire de sociologie végétale. Roumégous & Dehan, Montpellier.

Braun-Blanquet J. Roussine N. & Nègre R., 1951. Les groupements végétaux de la France méditerranéenne. Centre nationale de la recherche scientifique (C.N.R.S.): 297 pp.

Brullo S., 1983. Contributo alla conoscenza della vegetazione delle Madonie (Sicilia settentrionale). Boll. Acc. Gioenia Sci. Nat. 16 (322): 351-420.

Brullo S., Costanzo E. & Tomaselli V., 2001. Étude phytosociologique sur les peuplements à *Laurus nobilis* dans les Monts Iblei (Sicilie sud-orientale). Phytocoenologia 31(2): 249-270.

Brullo S., Guarino R. & Siracusa G., 1999. Revisione tassonomica delle querce caducifoglie della Sicilia. Webbia (54)1: 1-72.

Brullo S. & Marcenò, 1985. Contributo alla conoscenza della classe *Quercetea ilicis* in Sicila. Not. Fitosoc. 19(1): 183-227.

Brullo S., Scelsi F., Siracusa G. & Spampinato G., 1999. Considerazioni sintassonomiche e corologiche sui querceti caducifogli della Sicilia e della Calabria. Monti & Boschi 1: 16-29.

Brullo S., Scelsi F. & Spampinato G., 2001. La vegetazione dell'Aspromonte. Laruffa Ed., Reggio Calabria. 368 pp.

Caputo G., 1968. Ricerche sulla vegetazione forestale del gruppo del Taburno-Camposauro (Appennino campano). *Delpinoa* n.s. 8-9: 93-134.

Casini S., Chiarucci A. & De Dominicis V., 1995. Phytosociology and Ecology of Chianti woodlands. Fitosociologia 29: 115-136.

Catorci A. & Orsomando E., 1997. *Roso sempervirentis-Quercetum pubescentis* (Biondi 1996) nelle colline Premartane (Umbria, Italia centrale). Fitosociologia 32: 213-220.

Catorci A. & Orsomando E., 1998. Aspetti corologici e fitosociologici di *Quercus frainetto* Ten. in Umbria. Fitosociologia 35 (1): 51-64.

Chytrý M., 1997. Termophilous oak forests in the Czech Republic: Syntaxonomical revision of the *Quercetalia pubescenti-petraeae*. Folia Geobot. phytotax. 32 (3): 221-258.

Conti F., 1998. Flora d'Abruzzo. Bocconea 10: 1-273.

Corbetta F., 1974. Lineamenti della vegetazione lucana. Giorn. Bot. Ital. 108: 211-234.

Cresta P., Poggi G., Ubaldi D. & Zanotti A.L., 1995. Note sui boschi di cerro del Cornoviglio e di Vallecchia (bassa valle del Magra, Appennino Ligure orientale). Ann. Bot. (Roma) (1993) 51: 145-156.

Cutini M., Blasi C., 2002. Contributo alla definizione sintassonomica e sindinamica dei mantelli di vegetazione nella fascia collinare-submontana dell'Appennino centrale (Italia centrale). Fitosociologia 39 (1) (Suppl. 2): 97-120.

De Dominicis V. & Casini S., 1979. Memoria illustrativa per la Carta della Vegetazione della Val di Farma (Colline metallifere). Atti della Soc. Toscana di Sc. Naturali, serie B, 86: 1-36, Pisa.

Di Benedetto L., 1981. Contributo alla conoscenza della vegetazione del Piano Mesomediterraneo del versante Nord dell'Etna. Arch. Bot. Biogeogr. Ital. 57: 193-244.

Di Pietro R. & Blasi C., 1998. Gli ostrieti mesofili dei Monti Ausoni (Lazio meridionale). Arch. Geobotanico 3 (1) (1997): 19-40.

Di Pietro R. & Filibeck G., 2000. Terrazzamenti abbandonati e recupero della vegetazione spontanea. il caso dei Monti Aurunci. Inform. Bot. Ital. 32 (1): 27-40.

Di Pietro R., Izco J. & Blasi C., 2004. Contribute to the nomenclatural knowledge of the beech-woodland sintaxa of southern Italy. Plant biosystems 138 (1): 27-36.

Dimopoulos P. & Georgiadis T., 1995. Present state of the phytosociological research on the Greek mountains sintaxonomy and future perspectives. Ann. Bot. (Roma) 53: 119-133.

Fanelli G., 2002. Analisi fitosociologica dell'area metropolitana di Roma. Braun-Blanquetia 27: 1-269.

Ferrarini E., 1970. Considerazioni sull'origine della flora e sull' oscillazione dei piani di vegetazione delle Alpi Apuane. Lavori della Soc. Ital. Biogeogr. n.s. 1: 68-87.

Ferro G., Coniglione P., Olivieri S., Scuderi M. & Grasso S., 1980. Osservazioni fitosociologiche sugli aggruppamenti boschivi di Sicilia. Atti Acc. Gioenia 7 (Suppl. 12): 39-66.

Follieri M. & Magri D., 1994. Significati delle conoscenze palinologiche e paleobotaniche del quaternario Laziale. Mem. Descr. Carta Geol. D'It. 49: 169-176.

Follieri M. & Magri D., 1998. Paesaggi vegetali del Quaternario in Italia centrale. Biogeographia 19 (1997): 57-68.

Fortini P., Di Pietro R. & Blasi C., 1995 - Lo studio dei processi di riforestazione naturale applicato alla progettazione ambientale. IAED, Quaderni IAED *2:* 115-135.

Francalancia C., 1990. Boschi ad *Ostrya carpinifolia* Scop. e *Quercus cerris* L. su terreni arenacei e marnoso-arenacei dell'Appennino marchigiano centro-meridionale. Not. fitosoc. 23 (1987): 125-136.

Gamisans J., 1977. La végétation des montagnes corse. Phytocoenologia 4: 317-376.

Gentile S., 1970. Sui faggeti dell'Italia meridionale. Atti Ist.

Bot. Univ. Pavia ser. 6, 5 (1969): 207-306.

Géhu J.-M. & Rivas-Martinez S., 1981. Notions fondamentales de phytosociologie. In: Dierschke H. (Ed.). Syntaxonomie. Ber. Int. Symp., Rinteln (1980): 5-33. Cramer, Vaduz.

Gentile S., 1982. Zonation altitudinale de la végétation en Italie méridionale et en Sicilie (Etna exclu). Ecol. Medit., 8 : 323-337.

Gentile S., 1978. Memoria illustrativa della Carta della vegetazione naturale potenziale della Sicilia. Quad. Ist. Bot. Univ. Lab. Crit. Pavia 40: 5-114.

Govaerts F., 1995. Proposal to conserve or reject three species names in *Quercus* L. (Fagaceae). Taxon 44: 631-633.

Gracanin Z., 1962. I suoli della Regione carsica Croata. Ann. Acc. Italiana Scienze Forestali 11: 371-396.

Greuter W., Burdet H. M. & Long G., 1984-89. Med-Checklist. *1, 3, 4.* Genève.

Gruber M., 1968. *Ostrya carpinifolia* Scop. dans le secteur préligurien. Bull. Soc. Bot. France 115: 207-218.

Horvat I., 1938. Biljnosocioloska istrazivanja suma u Hrvatskoj. Glas. za sum. pokuse, 6. Zagreb.

Horvat I., (1950). Sumske zajedenice Jugoslavije (Les associations forestières en Yugoslavie). Inst. Sum Istraz. 1-77. Zagreb.

Horvat I., 1954. Pflanzengeographische gliederung südosteuropas. Vegetatio 5-6. 434-447.

Horvat I., 1956. Zanimljiv nalaz samonikle borove sume pod Obrucem. Biol. glasn. 9. Zagreb.

Horvat I., 1958. Laubwerfende Eichenzonen Südosteuropas in pflanzensoziologischer, klimatischer und bodenkundlicher Betrachtung. Angewandte pflanzensoziologie, Bericht überdas internationale Symposion Pflanzensoziologie-Bodenkunde vom 18. bis 22.9.1956 in Stolzenau/Weser: 50-62.

Horvat I., (1959). Sistematski odnosi termofilnih hrastovih i borovih suma Jugoistocne Europe (Warmeliebende Eichen und Kieferwalder sudosteuropas in systematischer Betrachtung). Biol. Glasn. 12: 1-40.

Horvat I., Glavac V. & Ellemberg H., 1974. Vegetation Sudosteuropas. Fischer Verlag, Stuttgart.

Horvatić S., (1939). Nastavak istrazivanja vegetacije otoka Krka. Liet. Jugosl. Akad. 51: 153-157.

Horvatić S., (1957). Pflanzengeographische Gliederung des Karstes Kroatiens und der angrenzenden Gebiete Jugoslawiens. - Acta Bot. Croat. 16: 33-52.

Horvatić S. (1963). Pflanzengeographische Stellung und Gliederung des Ostadriatischen Kustenlandes im Lichte der neusten phytozoenologischen Untersuchungen. Acta Bot. Croat. 22: 27-81.

Ivan D., Donita N., Coldea G., Sanda V., Popescu A., Chifu T., Boscaiu N., Mititelu D. & Panca-Comanescu M., 1993. Vegetation potentielle de la Roumanie. Braun –Blanquetia 9: 1-79.

Jakuks P. (1960). Noveau classement cenologique des bois de chenes xerothermes (*Quercetea pubescenti-petraeae* cl. nova) de l'Europe. Acta Botanica Academiae Scentiarum Hungaricae 6 (3/4).

Jakuks P., (1961). Die phytozönologische verhältnisse Flaumachien-uschwälder Südostmitteleuropas: 1-314. Budapest.

Jalas J. & Suominen J., 1972-94. Atlas Florae Europeae. Distribution of Vascular plants in Europe. 1-10. Helsinki.

Jalas J., Suominen J. & Lampinen, 1996. Atlas Florae Europeae. Distribution of Vascular plants in Europe. 11. Helsinki.

Klika J., 1938. Xerotherme Pflanzengesellschaften der Kovácover Hügel in der Südslovakei. BBC 58, Abteil. B.

Lakušič R., Pavlović D. & Redžić S., 1982. Horološko-Ekoloska i Floristicka diferencijacija suma i sikara sa bjelograbićem (*Carpinus orientalis* Mill.) i crnim grabom (*Ostrya carpinifolia* Scop.) na prostoru jugoslavije. Glas. Republ. Zavoda Zast Prirode, Prirodnjackog muzeja Titograd 15: 103-116.

Lausi, 1964. Vorläufiger Überblick über die Vegetation der triester Karstdolinen. Acta Bot. Croat., 4(extraord.): 65-71.

Lausi D., Gerdol R. & Piccoli F., 1982. Syntaxonomy of *Ostrya carpinifolia* woods in the southern Alps (northern Italy) based on numerical methods. Studia Geobot. 2: 41-58.

Lausi D. & Poldini L., 1962. Il Paesaggio vegetale della Costiera Triestina. Boll. Soc. Adriatica di Scienze (n. s.) 52. 2-62.

Lausi D. & Poldini L., 1966. Sind *Seslerio-Ostryetum* und *Carpinetum orientalis* klimaxgesellshaften? Angew. Pflanzensoziol: 18-19.

Lucchese F., 1990. Ruolo di alcune specie del genere *Brachypodium* nelle associazioni prative e forestali. Not. Fitosoc. 23 (1987): 173-188.

Lucchese F. & Pignatti S., 1990. Sguardo sulla vegetazione del Lazio marittimo. Quad. Accad. Naz. Lincei 264: 5-48. Roma.

Magri D., 1999. Quaternary history of *Fagus* in the Italian Peninsula. Ann Bot. (Roma) (1998) 54 (1): 147-154.

Mazzoleni S. & Ricciardi M., 1995. Boschi misti costieri in Campania. Ann. Bot. (Roma) 51 (Suppl. 10) (2) (1993): 341-352.

Meusel H., Jager E. & Weinert E., 1965. Vergleichende Chorologie der Zentraleuropaischen Flora. Fischer , Jena.

Mondino G.P., 1989. I querceti a bosso delle Alpi Cozie meridionali (Valle Grana e Maira). Riv. Piem. St. Nat. 7: 93-100.

Mondino G.P., Cristaldi L. & Puppi G., 1995. I querceti e i Querco-Ostrieti dell'Appennino Ligure-Piemontese (versante padano). Ann. Bot. (Roma) (1993) 51: 129-138.

Montacchini F., 1972. Lineamenti della vegetazione dei boschi naturali nella valle di Susa. Allionia 18: 195-252.

Montelucci G., 1972. Considerazioni sul componente orientale nelle foreste della penisola. Ann. Acc. It. Sci. For. 21: 121-169.

Montelucci G., 1978. Lineamenti della vegetazione del Lazio. Ann. Bot. (Roma) 35-36 (1976-1977): 1-107.

Mucina L., 1993. Nomenklatorische und syntaxonomische Definitionen, Konzepte und Methoden. In: Mucina L., Grabherr G. & Ellmauer T. (Eds.). Die Pflanzengesellschaften Österreichs, 1, Anthropogene Vegetation: 19-28. G. Fischer, Jena, Stuttgart, New York.

Murray E., 1971. *Acer* infraspecific taxa. Kalmia 3: 1-28.

Nardi E., 1976. La distribuzione italiana di *Dryopteris pallida* (Bory) Fomin. Webbia 30: 3-32.

Nardi E., 1984. The genus *Aristolochia* L. (Aristolochiaceae) in Italy. Webbia 38: 221-300.

Nardi E. & Tomei A., 1976. Osservazioni biosistematiche sul genere *Polypodium* L. in Italia. Webbia 30: 219-256.

Oberdorfer E., 1948. Gliederung und Grenzung der Mittelmeervegetation auf der Balkanhalbinsel. Ber. Geobot. Forschungsinst. Rübel. 3: 84-111, Zurich.

Oberdorfer E., 1968. Studien in den Wäldern des *Carpinion*-Verbandes in Apennin an der Südwestgrenze des Vorkommens von *Carpinus betulus*. Feddes Repert. 77(1).

Oberdorfer E., 1992. Süddeutsche Pflanzen-gesellschaften, 4 (Wälder und Gebüsche). Fischer Verlag, Stuttgart. 282 pp.

Oberdorfer E., & Hofmann A., 1967. Beitrag zur Kenntnis der Vegetation des Nordapennin. Beitr. naturk. Forsch. Südw. Dtl. 26 (1). 83-139.

Orsomando E., Catorci A. & Pitzalis M., 1998. Carta fitoclimatica dell'Umbria (scala 1:200.000). Regione dell'Umbria, Area assetto del territorio e P.U.T., Dipartimento di Botanica ed Ecologia, Univ. di Camerino. Istituto di Ecologia. Univ. di Perugia. S.EL. CA., Firenze.

Ozenda P., 1966. Perspectives nouvelles pour l'étude phytogéographique des Alpes du Sud. Docum. carte vég. Alpes 4: 1-198.

Ozenda P., 1990. La zone némorale xérotherme sud-européene. Giorn. Bot. Ital. 124: 759-780.

Paura B. & Abbate G., 1995. I querceti a caducifoglie del Molise. primo contributo sulla sintassonomia e sulla corologia. Ann. Bot. (Roma) 51 (Suppl. 10) (2) (1993): 325-340.

Pedrotti F., Ballelli S., Biondi E., Cortini-Pedrotti C. & Orsomando E., 1979a. Guida all'escursione della Società Italiana di Fitosociologia. Camerino. 43 pp.

Pedrotti F., Ballelli S. & Biondi E., 1979b. Boschi di *Ostrya carpinifolia* dell'Appennino umbro-marchigiano. *Ostrya* symposium, Trieste.

Pignatti S., 1967. Uber die submediterrane Vegetation des Pavesischen Apennins. Mitteil. Ostalp. Dinarisch. Pflanzensoziol. Arbeitsgemeinshaft. 7.

Pignatti S., 1982. Flora d'Italia. 1-3. Edagricole, Bologna.

Pignatti S., 1982. Die beteiligung der *Ostrya*-Gesellshaften in den submediterranen Vegetationskomplexen. Studia Geobot. 2: 211-217.

Pignatti S., 1998. I Boschi d'Italia. Utet, Torino.

Pignatti S. & Wikus-Pignatti E., 1990. Le cenosi a cerro e farnetto della penisola e della Sicilia. Not. fitosoc. 23 (1987): 107-124.

Pirone G., Corbetta F., Ciaschetti G., Frattaroli A. R. & Burri E., 2001. Contributo alla conoscenza delle serie di vegetazione del Piano collinare della valle del Tirino (Abruzzo, Italia centrale). Fitosociologia 38 (2): 3-24.

Podani J., 1993. Multivariate data analysis in ecology and systematics. A methodological guide to the Syn-tax 5.0 package, Ecological computations Series, Vol. 6 SPB Publishing, The Hage.

Podani J., 1994. Syn-tax 5.02 computer program for data analysis in Ecology and Systematics, UNIDO, Trieste.

Poldini L., 1982. *Ostrya carpinifolia*-rich woods and bushes of Friuli-Venezia Giulia (NE-Italy) and neighbouring territories. Studia Geobot. 2: 69-122.

Poldini L., 1988. Übersicht des Verbandes *Ostryo-Carpinion orientalis* (*Quercetalia pubescentis*) in SO Europa. Phytocoenologia 16 (1): 125-143.

Poldini L., 1989. La vegetazione del Carso Triestino ed Isontino, Studio del Paesaggio vegetale tra Trieste ed i territori adiacenti. Lint, Trieste. pp. 313.

Poldini L., 1998. Inquadramento fitosociologico In. Del Favero (eds.). La vegtazione forestale e la selvicultura nella regione Friuli-Venezia Giulia Voll. 1-2. Regione Autonoma Friuli-Venezia Giulia, direzione Regionale delle Foreste, Udine.

Poldini L & Vidali M., 1999. Kombinationsspiele unter Schwarzföhre, Weisskiefer, Hopfenbuche und Mannaesche in den Südostalpen. Wiss. Mitt. Niederösterr. Landesmuseum. 12: 105-136.

Poldini L., Vidali M., Biondi E. & Blasi C., 2002. La classe *Rhamno-Prunetea* in Italia. Fitosociologia 39 (1) (Suppl. 2): 145-162.

Poli E., 1979. Les étages de végétation de l'Etna et du Teyde. C.R. Soc. Biogéogr. 483: 111-126.

Pons A., (1984). Les changements de la végétation de la région Méditerranéenne durant le Pliocène et le Quaternaire en relation avec l'histoire du climat et de l'action de l'homme. Webbia 38: 427-439.

Puppi G. & Cristofolini G., 1996. Systematics of the Complex *Pulmonaria saccharata-P. vallarsae* and Related species (Boraginaceae). Webbia 51: 1-20.

Quézel P., Barbéro M., Akman Y., 1980. La végétation forestiére d'Anatolie septentrionale. Phytocoenologia 8 (3/4): 365-519.

Quézel P., Barbéro M. & Akman Y., 1992. Typification de syntaxa décrits en région méditerranéenne orientale. Ecol. Medit. 18: 81-87.

Raimondo F.M., 2000. Carta del paesaggio e della biodiversità vegetale della provincia di Palermo. Quad. Bot. Ambientale Appl. 9 (1998): 3-160.

Rikli M., 1943-1948. Das Pflanzenkleid der Mittelmeerländer. Bern.

Rivas-Martínez S., 1972. Apuntes sobre la Sintaxonomia del Orden *Quercetalia pubescentis* en España. Anales Ist. Bot. A. J. Cavanilles 29: 123-128.

Rivas-Martínez S., 1987. Bioclimatologia. In. Peinado Lorca M. & Rivas-Martínez S. (Eds.) La Vegetation de España. Coll. Aula Abierta, Madrid: 35-45.

Rivas-Martínez S., 1995. Clasificación bioclimática de la Tierra. Folia Botanica Matritensis 16: 1-32.

Rivas-Martínez, S., Fernandez-Gonzàlez F., Izco J., Loidi J., Lousã M. & Penas A., 2002. Vascular plant communities of Spain and Portugal (addenda to the sintaxonomicalò checklist of 2001). Itinera Geobot. 15(2): 433-922.

Rivas-Martínez, S., Fernandez-Gonzàlez F., Loidi J., Lousã M. & Penas A., 2001. Sintaxonomical Checklist of vascular plant communities of Spain and Portugal to association level. Itinera Geobot. 14: 1-341.

Rivas-Martínez S. & Penas A., 2001. Biogeographic map of Europe. Cartographic service, University of Leon, Spain.

Rivas-Martínez S., Penas A. & Díaz T., 2001. Bioclimatic Map of Europe. Cartographic service, University of Leon, Spain.

Rivas-Martínez S. & Saenz Lain C., 1991. Enumeracion de los *Quercus* de la Peninsula Iberica. Rivasgodaya 6: 101-110.

Ronsisvalle G. & Signorello P., 1979. Contributo allo studio fitosociologico dei castagneti dell'Etna. Boll. Acc. Gioenia (ser. 4) 13: 9-41.

Schmidt E., 1963. Fondamenti della distribuzione naturale della vegetazione Mediterranea. Arch. Bot. e Biogeogr. Ital. 34.

Scoppola A., 1998. La vegetazione della Riserva Naturale di Monte Rufeno (VT). Regione Lazio, Assessorato U.T.V. delle risorse ambientali – Riserva Naturale Monte Rufeno, Comune di Acquapendente.

Scoppola A., Blasi C., Abbate G., Cutini M., Di Marzio P., Fabozzi C. & Fortini P., 1995. Analisi critica e considerazioni fitogeografiche sugli ordini e le alleanze dei querceti e boschi misti a caducifoglie dell'Italia peninsulare. Ann. Bot. (Roma) 51 (Suppl. 10) (1) (1993): 81-112.

Scoppola A., Blasi C., Spada F. & Abbate G., 1990. Sulle cenosi a *Quercus petraea* dell'Italia centrale. Not. fitosoc. 23 (1987): 85-106.

Scoppola A. & Filesi L., 1995. I boschi di latifoglie della riserva naturale regionale Monte Rufeno (VT). Ann. Bot. (Roma) (1993) 51 (Suppl.10)(2): 241-275.

Scoppola A. & Filesi L., 1998. Sui querceti del *Lathyro montani-Quercion cerridis* dell'alto Lazio. Ann. Bot. (Roma) 54 (1996): 295-301.

Soó R., 1963. Sistematische übersicht der pannonischen Pflanzengeselleshaften VI. Die gebirgswälder II. Acta Bot. Acad. Sci. Hung. 9: 123-150.

Stortelder A.H.F., Bergmann H.H.M. & Westhoff V., 1986. Vegetation information valves in a submediterranean ecosystem. Doc. Phytosoc. 12: 1-25.

Taffetani F. & Biondi E., 1995. Boschi a *Quercus cerris* e *Carpinus orientalis* Miller nel versante Adriatico italiano. Ann. Bot. (Roma) 51 (Suppl. 10) (2) (1993): 229-240.

Taffetani F., 2000. Serie della vegetazione del complesso geomorfologico del Monte dell'Ascensione (Italia centrale). Fitosociologia 37 (1): 93-151.

Theurillat J.P., Aeschimann D., Küpfer P. & Spichiger R., 1995. The higher vegetation units of the Alps. Coll. Phytosoc. 23 (1994): 239.

Theurillat J.P. & Moravec J., 1991. Index of New names of Syntaxa Published in 1988. Folia Geobot. Phytotax. 26: 197-212.

Tomažič G., 1940. Asociacije borovih gozdov v Sloveniji. Rad Akad 1: 77-120. Ljubljana.

Trinajstic I., 1990. Sulla sintassonomia delle vegetazioni termofile caducifoglie dell'ordine *Quercetalia pubescentis* BR.-Bl. del litorale adriatico jugoslavo. Not. Fitosoc. 23 (1987): 21-28.

Tutin T.G., Burges N. A., Chater A. , Edmonson J. R., O.,Heywood V. H., Moore D. M., Valentine D. M., Walters S. M. & Webb D. A., 1993. Flora Europaea 1. Cambridge Univ. Press.

Tutin T.G., Heywood V. H., Burges N. A., Moore D. M., Valentine D. M., Walters S. M. & Webb D. A., 1976. Flora Europaea 4. Cambridge Univ. Press.

Tzedakis P.C. (1993). Long-term tree populations in northwest Greece through multiple Quaternary climatic cycles. Nature 364: 437-440.

Ubaldi D., 1971. Lineamenti della vegetazione di Vergato (Valle del Reno) ai fini della cartografia della vegetazione. Arch. Bot. Biogeogr. Ital. 47: 90-106.

Ubaldi D., 1974. Faggeti e boschi montani a cerro nel Montefeltro (Appennino romagnolo-marchigiano). Not.

fitosoc. 9: 83-129.

Ubaldi D., 1980. La vegetazione di Monte Sole (Bologna) con carta 1.10.000. Atti del Seminario "La cartografia della vegetazione per la gestione del territorio. Regione Emilia Romagna, C.N.R., Bologna.

Ubaldi D., Puppi G., Speranza M. & Zanotti A.M., 1984. Primi risultati sulla tipologia fitosociologica dei boschi di Quercus pubescens nella provincia di Pesaro e Urbino. Arch. Bot. e Biogeogr. Ital. 60: 150-168.

Ubaldi D., 1988. La vegetazione boschiva della provincia di Pesaro e Urbino. Esercitazioni dell'Accademia Agraria in Pesaro, Serie 3, vol. 20: 99-192.

Ubaldi D., 1995. Tipificazione di Sintaxa forestali appenninici e siciliani. Ann. Bot. (Roma) 51 (Suppl. 10) (1) (1993): 113-128.

Ubaldi D., 2003. La vegetazione boschiva d'Italia (manuale di Fitosociologia forestale). Clueb, Bologna. 368 pp.

Ubaldi D., Puppi G., Speranza M. & Zanotti A.L., 1984. Primi risultati sulla tipologia fitosociologica dei boschi di *Quercus pubescens* della provincia di Pesaro e Urbino. Arch. Bot. Biogeogr. Ital. 60 (3-4): 150-168.

Ubaldi D., Puppi G., Speranza M., Zanotti A.L. & Corbetta F., 1986. Contributo alla tipologia fitosociologica dei boschi di latifoglie decidue dell'Italia peninsulare. Giorn. Bot. Ital. 120 (Suppl. 2): 165.

Ubaldi D. & Speranza M., 1982. L'inquadramento sintassonomico dei boschi a *Quercus cerris* ed *Ostrya carpinifolia* del Flysch dell'Appennino marchigiano settentrionale. Studia geobot. 2: 123-140.

Ubaldi D. & Speranza M., 1985. Quelques hêtraies du fagion et du *Laburno-Ostryon* dans l'Apennin septentrional (Italie). Doc. Phytosoc. n.s. 10: 52-71.

Ubaldi D. & Zanotti A. L., 1994. Distinction phytosociologique entre *Ostryo-Carpinion* et *Quercion ilicis* en Italie. Ecol. Medit. 20 (3/4): 137-149.

Ubaldi D., Zanotti A.L., Puppi G., Speranza M. & Corbetta F. (1990). Sintassonomia dei Boschi caducifogli mesofili dell'Italia peninsulare. Not. Fitosoc. 23 (1987): 31-62.

Ubaldi D. Zanotti A.L., Puppi G. & Maurizzi S., 1995. I boschi del *Laburno-Ostryon* in Emilia-Romagna. Ann. Bot. (Roma) 51 (Suppl. 10) (1) (1993): 157-170.

Van Gelderen D.M., De Jong P.C. & Oterdoom H.J., 1994. Maples of the world. Timber press, Oregon. 458 pp.

Wallnöfer S., Mucina L. & Grass V., 1993. *Querco-Fagetea*, In. Mucina L. Grabherr G & Wallnöfer S. (eds), 1993, Pflanzengesellschaften Österreichs, 3 (Wälder und Gebüsche), Gustav Fischer, Jena: 85-236.

Weber H.E., 1998. Outline of the vegetation of scrubs and hedges in the Temperate and boreal zone of Europe. Itinera Geobotanica 11: 85-120.

Weber H.E., Moravec J. & Theurillat J.P., 2000. International Code of Phytosociological Nomenclature. 3rd. edition. J. Veg. Sci. 11: 739-768.

Wraber M., 1960, Pflanzensoziologische Gliederungder Waldvegetation in Slowenien. Ad. Ann. Hort. Bot. Labac. Solemn. Ljubljana. 49-96.

Wraber, 1967. Oekologische und pflanzensoziologische Charakteristik der Vegetation des slowenischen küstenländischen Karstgebietes. Mittel. Ostalp.-Dinarisch. Pflanzensoziol. Arbeitsgemeinschaft. 7.

Zanotti A.L, Ubaldi D., Corbetta F. & Pirone G., 1995. Boschi submontani dell'Appennino Lucano Centro-Meridionale. Ann. Bot. (Roma) 51 (Suppl. 10) (1) (1993): 47-68.

Appendix 1

List of the phytosociological tables utilized in the various multivariate analysis procedures

Aceri monspessulani-Quercetum virgilianae Brullo, Scelsi & Spampinato 2001 (Tab. 2, in Brullo, Scelsi & Spampinato 2001). *Aceri lobelii-Fagetum Aita*, Corbetta & Orsino1984 (Tab. 2, in Aita *et al.*, 1984); *Aceri obtusati-Ostryetum carpinifoliae* Brullo & Marcenò 1985 (Tab. 13, in: Brullo & Marcenò, 1985); *Aceri obtusati-Quercetum cerridis aceretosum monspessulanii* Ubaldi 1995 (Tab. 12, in: Ubaldi, 1988); *Aceri obtusati-Quercetum cerridis peucedanetetosum cervariae* Ubaldi & Speranza *ex* Ubaldi 1995 (Tab. 3, in: Ubaldi & Speranza 1982 = aspect with *Pteridium aquilinum*); *Aceri obtusati-Quercetum cerridis serratuletosum* Ubaldi & Speranza *ex* Ubaldi 1995 (Tab. 2, in: Ubaldi & Speranza 1982); *Aceri obtusati-Quercetum cerridis* Ubaldi & Speranza *ex* Ubaldi 1995 (Tab. 1, in: Ubaldi & Speranza 1982); *Aegopodio-Quercetum petraeae* Ubaldi *et al. ex* Ubaldi 1995 (Tab. 2, in Oberdorfer & Hofmann, 1967 p.p.) *Agropyro panormitani-Quercetum congestae* Brullo, Scelsi, Siracusa & Spampinato 1999 (Tab. 4, in: Brullo, Scelsi, Siracusa & Spampinato, 1999); *Allio pendulini-Quercetum cerridis* Ubaldi, Zanotti, Puppi, Speranza, Corbetta *ex* Ubaldi 1995 (Tab. 9, in: De Dominicis & Casini 1979 = mosaic of two vegetation types); *Aquifolio-Fagetum abietetosum albae* Abbate 1990 (Tab. 1, in Abbate, 1990); *Aquifolio-Fagetum* Gentile 1970 (Tab. 3, in: Gentile 1970); *Arabido turritae-Quercetum congestae* Brullo & Marcenò 1985 (Tab. 12, in: Brullo & Marcenò, 1985); *Arbuto unedonis-Castanetum sativae* Arrigoni & Viciani 2001 (Tab. 6 in Arrigoni & Viciani 2001); *Asparago acutifolii-Ostryetum carpinifoliae* Biondi *ex* Ubaldi 1995 (Tab. 2, in Biondi, 1982); *Asparago acutifolii-Ostryetum carpinifoliae* Biondi *ex* Ubaldi 1995 (Tab. 19, in: Biondi, 1986); *Asparago acutifolii-Ostryetum carpinifoliae* Biondi *ex* Ubaldi 1995 (Tab. 2, in:

Blasi, Cutini, Fortini & Di Marzio, 1995); *Asparago tenuifolii-Carpinetum betuli* Arrigoni 1997 (Tab. 2, in: Arrigoni, 1997); *Asparago tenuifolii-Quercetum cerridis lathyretosum nigri* Scoppola & Filesi 1995 (Tab. 3, in: Scoppola & Filesi, 1995); *Asparago tenuifolii-Quercetum cerridis* Scoppola & Filesi 1995 (Tab. 3, in: Scoppola & Filesi, 1995); *Asphodelo-Castanetum* Ubaldi, Puppi, Zanotti, Speranza & Corbetta *ex* Ubaldi 1995 (Tab. 5, in: Ubaldi 1980 = chestnuts woods); *Asplenio-Ostryetum* Ubaldi, Puppi, Zanotti, Speranza & Corbetta *ex* Ubaldi 1995 (Tab. 4, in: Barbero & Bono, 1971 = *Ostryo-Leucanthemetum* Barbero & Bono 1971); *Asplenio onopteris-Quercetum cerridis* Ubaldi, Puppi, Zanotti, Speranza & Corbetta *ex* Ubaldi 1995 (Tab. 7, in: Pedrotti F., Ballelli S., Biondi E., Cortini Pedrotti C., Orsomando E., 1980 = Oak woods with *Quercus pubescens* and *Quercus cerris*); *Buxo-Quercetum pubescentis* (Tab. 6, in Barbero & Bono, 1971); *Buxo-Quercetum* with *Teucrium scorodonia* and *Lathyrus montanus* (Tab. 6, in Mondino, 1989); *Calamagrosti-Ostryetum* Ubaldi, Puppi, Zanotti, Speranza & Corbetta 1990 (Tab. 9, in: Ubaldi, Puppi, Zanotti, Speranza & Corbetta, 1990); *Campanulo-Quercetum pubescentis* Ubaldi, Puppi, Zanotti, Speranza & Corbetta *ex* Ubaldi 1995 (Tab. 3, in: Barbero & Bono, 1971 = *Orno-Quercetum pubescentis* Barbero & Bono 1971); *Cardamino kitaibelii-Castanetum sativae* Taffetani 2000 (Tab. 2, in Taffetani, 2000); *Carpino betuli-Coryletum avellanae* Ballelli, Biondi & Pedrotti *ex* Venanzoni 1999 (Tab. 1, in: Ballelli, Biondi & Pedrotti, 1980); *Carpino orientalis-Quercetum cerridis* Blasi *ex* Taffetani & Biondi 1995 (Tab. 1, in: Blasi, 1984); *Castanea sativa* community type (Tab. 3, in: Bonin & Gamisans, 1976); *Celtido aetnensis-Quercetum virgilianae* Brullo & Marcenò 1985 (Tab. 4, in: Brullo & Marcenò, 1985); *Centaureo-Quercetum pubescentis* Zanotti, Ubaldi, Corbetta & Pirone 1995 (Tab. 1, in Zanotti *et al.*, 1995); *Cephalanthero-Quercetum cerridis* Scoppola & Filesi 1998 (Tab. 1, in Scoppola & Filesi 1998); *Cercidi-Quercetum pubescentis* Ubaldi 1995 (Tab. 14, in Ubaldi, 1988 = *Asparago acutifolii-Ostryetum carpinifoliae cytisetosum sessilifolii* Ubaldi 1988); *Clematido flammulae-Quercetum* pubescentis Ubaldi, Zanotti & Puppi 1993 (Tab. 2F, in Ubaldi, Zanotti & Puppi, 1993); *Corno maris-Ostryetum carpinifoliae* Blasi *et al.* 1982 (Tab. 2, in: Blasi *et al.*, 1982); *Coronillo emeri-Quercetum cerridis* Blasi 1984 (Tab. 1, in: Blasi & Filesi, 1990); *Coronillo emeri-Quercetum cerridis* Blasi 1984 (Tab. 1, in: Blasi, 1984); *Coronillo emeri-Quercetum cerridis* Blasi 1984 (Tab. 4, in: Catorci & Orsomando, 1998); *Corydalidi-Fagetum* Ubaldi 1980 (Tab. 1, in Blasi *et al.*, 1990); *Corylo-Aceretum neapolitani* Brullo, Scelsi & Spampinato 2001 (Tab. 22, in: Brullo, Scelsi & Spampinato, 2001); *Cytiso sessilifolii-Quercetum pubescentis* Blasi *et al.* 1982 (Tab. 1, in: Blasi *et al.*, 1982); *Cytiso sessilifolii-Quercetum pubescentis buxetosum* Pirone, Corbetta, Ciaschetti, Frattaroli & Burri 2001 (Tab. 1, in: Pirone, Corbetta, Ciaschetti, Frattaroli & Burri, 2001); *Cytiso-Quercetum frainetto* Scelsi & Spampinato 1996 (Tab. 1, in: Scelsi & Spampinato, 1996); *Dactylorizo-Quercetum petraeae* Ubaldi *et al. ex* Ubaldi 1995 (Tab. 2, in Oberdorfer & Hofmann, 1967 p.p.); *Daphno laureolae-Ostryetum carpinifoliae* Arrigoni in Arrigoni, Foggi, Bechi & Riccieri, 1997 (Tab. 9, in: Arrigoni, Foggi, Bechi & Riccieri, 1997); *Daphno laureolae-Quercetum cerridis aceretosum obtusati* Taffetani & Biondi 1995 (Tab. 2, in: Taffetani & Biondi, 1995); *Daphno laureolae-Quercetum cerridis* Taffetani & Biondi 1995 (Tab. 2, in: Taffetani & Biondi, 1995); *Digitalidi australis-Castanetum sativae* Gamisans 1977 (Tab. 7 in Arrigoni & Viciani 2001); *Dryopterido-Ostryetum* Ubaldi , Zanotti, Puppi & Maurizzi 1995 (Tab. 3, in Ubaldi *et al.*, 1995a); *Echinopo siculi-Quercetum frainetto* Blasi & Paura 1995 (Tab. 1, in: Arrigoni, 1974 = *Quercus cerris* and *Quercus frainetto* woodlands = *Pulicario odorae-Quercetum frainetto* Ubaldi, Puppi, Zanotti, Speranza & Corbetta 1990 *ex* Ubaldi 2003); *Echinopo siculi-Quercetum frainetto* Blasi & Paura 1995 (Tab. 2, in: Blasi & Paura, 1995); *Echinopo siculi-Quercetum frainetto* Blasi & Paura 1995 (Tab. 2, in: Paura & Abbate, 1995); *Erico arboreae-Quercetum congestae* Brullo, Scelsi & Spampinato 2001 (Tab. 23, in: Brullo, Scelsi & Spampinato 2001); *Erico arboreae-Quercetum cerridis* Arrigoni 1990 (Tab. 2, in Biondi *et al.*, 1995); *Erico arboreae-Quercetum cerridis* Arrigoni, in Arrigoni *et al.* 1990 (Tab. 2, in Arrigoni *et al.*, 1990); *Erico arboreae-Quercetum virgilianae* Brullo & Marcenò 1985 (Tab. 11, in: Brullo & Marcenò, 1985); *Euphorbio apii-Quercetum trojanae* Bianco, Brullo, Minissale, Signorello & Spampinato 1998 (Tab. 1, in: Bianco, Brullo, Minissale, Signorello & Spampinato, 1998); *Euphorbio apii-Quercetum trojanae poetosum sylvicolae* Bianco, Brullo, Minissale, Signorello & Spampinato 1998 (Tab. 1, in: Bianco, Brullo, Minissale, Signorello & Spampinato, 1998); *Euphorbio phymatospermae-Ostryetum carpinifoliae* Di Pietro & Blasi 1998 (Tab. 3, in Di Pietro & Blasi, 1998); *Fago-Quercetum cerridis* Ubaldi, Zanotti, Puppi, Speranza, Corbetta *ex* Ubaldi 1995 (Tab. 8, in: De Dominicis & Casini 1979 = mesophilous aspect of *Quercetalia robori petraeae*):; *Festuco heterophyllae-Quercetum congestae* Brullo & Marcenò 1985 (Tab. 16, in: Brullo & Marcenò, 1985); *Festuco-Aceretum neapolitani* Mazzoleni & Ricciardi, 1995 (Tab. 1, in: Mazzoleni & Ricciardi, 1995); *Festuco drymeiae-Aceretum neapolitani coryletosum avellanae* Maiorca & Spampinato 1999 (Tab. 5a, in: Maiorca & Spampinato, 1999); *Frangulo alni-Quercetum petraeae* (Arrigoni 1997) Foggi, Selvi, Viciani, Bettini, Gabellini 2000 (Tab. 4, in: Arrigoni, 1997 = *Ilici aquifolii-Quercetum petraeae*); *Fraxino excelsiori-Ostryetum* Ubaldi *et al. ex* Ubaldi 1995 (Tab. 3, in: Barbero & Bono, 1971 = *Ostryo-*

Fraxinetum orni Barbero & Bono 1971); *Fraxino orni-Populetum tremulae* Taffetani 2000 (Tab. 1, in Taffetani,2000); *Fraxino oxyacarpae-Quercetum cerridis* Foggi & Selvi 1998 (Tab. 3, in: Scoppola & Filesi, 1995 = *Asparago tenuifolii-Quercetum cerridis fraxinetosum oxyaca*rpae Scoppola & Filesi 1995); *Hieracio racemosi-Quercetum petraeae fraxinetosum orni* Arrigoni 1997 (Tab. 6, in: Arrigoni, 1997); *Hieracio racemosi-Quercetum petraeae* Pedrotti, Ballelli & Biondi 1982 (Tab. 1, in Pedrotti, Ballelli & Biondi, 1982); *Ilici aquifolii-Quercetum petraeae* Arrigoni 1997 nec *Ilici-Quercetum petraeae* Brullo & Marcenò in Brullo 1983 (Tab. 4, in: Arrigoni, 1997); *Knautio drymeiae-Ostryetum sorbetosum ariae* Mondino, Cristaldi & Puppi 1995 (Tab. 2, in Mondino *et al.*, 1995); *Knautio drymeiae-Ostryetum viburnetosum* Mondino, Cristaldi & Puppi 1995 (Tab. 2, in Mondino *et al.*, 1995); *Knautio purpureae-Quercetum pubescentis cephalantheretosum* Ubaldi, Zanotti & Puppi 1993 (Tab. 2D, in Ubaldi, Zanotti & Puppi, 1993); *Knautio purpureae-Quercetum pubescentis stachydetosum* Ubaldi, Zanotti & Puppi 1993 (Tab. 2E, in Ubaldi, Zanotti & Puppi, 1993); *Knautio purpureae-Quercetum pubescentis* Ubaldi, Zanotti & Puppi 1993 (Tab. 2C, in Ubaldi, Zanotti & Puppi, 1993); *Lathyro digitati-Quercetum cerridis anemonetosum* Bonin & Gamisans 1976 (Tab. 1, in: Bonin & Gamisans, 1976); *Lathyro digitati-Quercetum cerridis asparagetosum* Bonin & Gamisans 1976 (Tab. 1, in: Bonin & Gamisans, 1976); *Lathyro digitati-Quercetum cerridis clematidetosum* Bonin & Gamisans 1976 (Tab. 1, in: Bonin & Gamisans, 1976); *Lathyro jordanii-Quercetum cerridis* Zanotti, Ubaldi, Corbetta & Pirone 1995 (Tab. 1, in Zanotti *et al.*, 1995); *Lathyro montani-Quercetum cerridis* Ubaldi, Puppi, Zanotti, Speranza & Corbetta *ex* Ubaldi 1995 (Tab. 8, in: Barbero & Bono, 1971 = *Quercus cerris* community type Barbero & Bono 1971); *Lauro-Carpinetum betuli* Lucchese & Pignatti 1990 (Tab. 10, in: Lucchese & Pignatti, 1990); *Lauro nobilis-Quercetum virgilianae* Brullo, Costanzo & Tomaselli 2001 (Tab. 2, in Brullo, Costanzo & Tomaselli 2001); *Lembotropidi-Quercetum cerridis* Ubaldi 1995 (Tab. 4, in: Ubaldi 1980 = *Quercus cerris* and *Quercus pubescens* woods); *Lonicero etruscae-Carpinetum orientalis* Blasi, Di Pietro, Filesi & Fortini 2001 (Tab. 1, in Blasi *et al.*, 2001); *Lonicero etruscae-Carpinetum orientalis phillyreetosum latifoliae* Blasi, Di Pietro, Filesi & Fortini 2001 (Tab. 1, in Blasi *et al.*, 2001); *Lonicero xilostei-Quercetum cerridis* Taffetani & Biondi ex Biondi & Allegrezza 1996 (Tab. 2, in: Taffetani & Biondi, 1995 = *Lonicero xylostei-Carpinetum orientalis*); *Lonicero xilostei-Quercetum cerridis melicetosum uniflorae* Biondi & Allegrezza 1996 (Tab. 3, in: Biondi & Allegrezza, 1996); *Malo florentinae-Quercetum frainetto* Biondi, Gigante, Pignattelli, Venanzoni 2001 (Tab. 4, in: Catorci & Orsomando 1998 = *Coronillo emeri-Quercetum cerris genistetosum germanicae* Catorci & Orsomando 1998); *Malo florentinae-Quercetum frainetto* Biondi, Gigante, Pignattelli, Venanzoni 2001 (Tab. 2, in: Biondi, Gigante, Pignattelli & Venanzoni, 2001); *Malo florentinae-Quercetum frainetto viburnetosum tini* Biondi, Gigante, Pignattelli, Venanzoni 2001 (Tab. 2, in: Biondi, Gigante, Pignattelli, Venanzoni 2001); *Melampyro italici-Castanetum sativae* Hruska 1988 (Tab. 1, in: Hriska, 1988); *Melampyro italici-Ostryetum* Ubaldi *et al.*, 1990 (Tab. 10, in: Ubaldi *et al.*, 1990); *Melampyro italici-Ostryetum* Ubaldi *et al.*, 1990 (Tab. 2, in: Abbate *et al.*, 1995); *Melico-Quercetum cerridis* Arrigoni, in Arrigoni *et al.* 1990 (Tab. 3, in Arrigoni *et al.*, 1990); *Melico-Quercetum cerridis carpinetosum betuli* Arrigoni in Arrigoni, Mazzanti & Ricceri 1990 (Tab. 3, in: Arrigoni, Mazzanti & Ricceri, 1990); *Melittio-Ostryetum carpinifoliae* Avena *et al.* 1980 (Tab. 1, in Avena *et al.*, 1980); *Melittio-Ostryetum carpinifoliae* Avena *et al.* 1980 (Tab. 1, in Di Pietro & Blasi, 1998); *Melittio-Ostryetum carpinifoliae ilicetosum* Di Pietro & Blasi 1998 (Tab. 2, in Di Pietro & Blasi, 1998); *Melittio-Quercion frainetto* woodlands (Tab. 1, in: Abbate, Fascetti, Blasi, Michetti & Avena, 1995); *Mespilo germanicae-Quercetum frainetto* Biondi, Gigante, Pignattelli & Venanzoni 2001 (Tab. 1, in: Tedeschini Lalli, 1995 = *Mespilus germanica* and *Quercus frainetto* community type); *Mespilo germanicae-Quercetum frainetto quercetosum roboris* Biondi, Gigante, Pignattelli & Venanzoni 2001(Tab. 2, in: Biondi, Gigante, Pignattelli & Venanzoni 2001); *Mespilo-Quercetum frainetto arbutetosum* Blasi C., Stanisci A., Filesi L., Milanese A., Perinelli E. & Riggio L., 2002 (Tab. 1, in: Blasi C., Stanisci A., Filesi L., Milanese A., Perinelli E. & Riggio L., 2002); *Mespilo-Quercetum virgilianae* Brullo & Marcenò 1985 (Tab. 6, in: Brullo & Marcenò, 1985); Mixed broad-leaved deciduous woodlands (Tab. 1, in: Caputo, 1968); Oak woods with *Lonicera etrusca* (Tab. 1, in Mondino *et al.*, 1995); *Oleo-Quercetum virgilianae* Brullo 1984 (Tab. 24 in Brullo, 1984); *Ostryo-Aceretum opulifolii anemonetosum* Ubaldi 1995 (Tab. 1, in Ubaldi *et al.*, 1995a); *Orno-Quercetum pubescentis* Barbero et Bono 1970 (Tab. 3, in Barbero & Bono, 1970); *Ostryo-Aceretum opulifolii* Ubaldi *ex* Ubaldi 1995 (Tab. 1, in Ubaldi *et al.*, 1995a); *Ostryo-Campanuletum persicifoliae* Barbero, Gruber & Loisel 1971 (Tab. 4, in Barbero, Bono & Loisel, 1971); *Ostryo-Seslerietum italicae* Ubaldi 1974 (Tab. 2, in Ubaldi 1974); *Peucedano cervariae-Quercetum pubescentis* Ubaldi 1988 (Tab. 11, in : Ubaldi, 1988); *Peucedano cervariae-Quercetum pubescentis astragaletosum* Ubaldi 1988 (Tab. 12, in : Ubaldi, 1988); *Physospermo cornubiensis-Quercetum petraeae* Oberdorfer & Hofmann 1967 (Tab. 1-2, in: Oberdorfer & Hofmann, 1967); *Physospermo cornubiensis-Quercetum petraeae* Oberdorfer & Hofmann 1967 (Tab. 10, in: Orsino & Fossati-Sanviti, 1986); *Physospermo verticillati-Quercetum cerridis abieti-fagetosum sylvaticae* Aita, Corbetta & Orsino 1977 (Tab. 1,

in Aita *et al.*, 1977); *Physospermo verticillati-Quercetum cerridis* Aita, Corbetta & Orsino 1977 (Tab. 1, in Aita *et al.*, 1977); *Physospermo verticillati-Quercetum cerridis allietosum pendulinii* Aita, Corbetta & Orsino 1977 (Tab. 1, in Aita *et al.*, 1977); *Physospermo verticillati-Quercetum cerridis fraxinetosum orni* Ubaldi, Zanotti, Puppi, Speranza, Corbetta *ex* Ubaldi 1995 (Tab. 1, in Aita *et al.*, 1977 = *Physospermo-Quercetum aceretosum monspessulanii*); *Pistacia lentiscus & Quercus pubescens* community type, (Tab. 2, in Blasi & Di Pietro, 1998); *Plagio-Ostryetum campanuletosum* Gruber 1968 (Tab. 2, in: Gruber, 1968 = *Ostryeto-Plagietum* subass. a *Campanula persicifolia* Gruber 1968); *Plagio-Ostryetum* Gruber 1968 (Tab. 2, in: Gruber, 1968 = *Ostryeto-Plagietum* Gruber 1968); *Plagio-Ostryetum rhoetosum* Gruber 1968 (Tab. 2, in: Gruber, 1968 = Ostryeto-Plagietum subass. a *Rhus cotinus* Gruber 1968); *Plagio-Ostryetum campanuletosum* Gruber 1968 (Tab. 2, in: Gruber, 1968 = Ostryeto-Plagietum subass. a *Campanula persicifolia* Gruber 1968); *Pulicario odorae-Quercetum frainetto* Ubaldi, Zanotti, Puppi, Speranza & Corbetta *ex* Ubaldi 2003 (Tab. 1, in Arrigoni, 1974); *Quercetum frainetto suberis* Blasi, Filesi, Fratini & Stanisci 1998 (Tab. 2, in: Blasi, Filesi, Fratini & Stanisci 1998); *Quercetum gussonei* Brullo & Marcenò 1985 (Tab. 16, in: Brullo & Marcenò, 1985); *Quercetum leptobalanae* Brullo & Marcenò 1985 (Tab. 9, in Brullo & Marcenò, 1985); *Querco cerridis-Betuletum pendulae* Biondi, Brugiapaglia & Tedeschini-Lalli 1998 (Tab. 4, in: Biondi, Brugiapaglia & Tedeschini-Lalli, 1998); *Quercus cerris* and *Quercus pubescens* mixed oak woods (Tab. 1, in: Abbate *et al.*, 1995); *Quercus cerris* and *Quercus pubescens* termophilous woodlands (Tab. 2, in: Paura & Abbate, 1995); *Quercus cerris* mesophilous woodlands (Tab. 2, in: Bonin & Gamisans, 1976); *Quercus pubescens* and *Tamus communis* woods (Tab. 2, in Francalancia *et al.*, 1995); *Quercus pubescens* open woods (Tab. 1, in: Abbate *et al.*, 1995); *Roso caninae-Ostryetum* Ubaldi, Puppi, Zanotti, Speranza & Corbetta *ex* Ubaldi 1995 (Tab. 5, in: Barbero & Bono, 1971 = *Ostryo-Seslerietum autumnalis* Horvat 1950); *Roso sempervirentis-Quercetum pubescentis* Biondi 1986 (Tab. 18, in: Biondi, 1986); *Roso sempervirentis-Quercetum pubescentis* Biondi 1986 (Tab. 6, in: Biondi *et al.*, 1990); *Roso sempervirentis-Quercetum pubescentis carpinetosum orientalis* Blasi & Di Pietro 1998 (Tab. 2, in Blasi & Di Pietro, 1998); *Roso sempervirentis-Quercetum pubescentis ericetosum arborae* Taffetani 2000 (Tab. 10, in: Taffetani, 2000); *Roso sempervirentis-Quercetum pubescentis ericetosum multiflorae* Catorci & Orsomando 1997 (Tab. 2, in: Catorci & Orsomando, 1997); *Roso sempervirentis-Quercetum pubescentis quercetosum cerridis* Arrigoni in Arrigoni, Foggi, Bechi & Riccieri, 1997 (Tab. 6, in: Arrigoni, Foggi, Bechi & Riccieri, 1997); *Scutellario-Ostryetum* Pedrotti, Ballelli & Biondi *ex* Pedrotti, Ballelli, Biondi, Cortini-Pedrotti & Orsomando, 1980; *Scutellario-Ostryetum* Pedrotti, Ballelli & Biondi *ex* Pedrotti, Ballelli, Biondi, Cortini-Pedrotti & Orsomando, 1980 (Tab. 1, in: Ballelli *et al.*, 1982); *Senecio stabiani-Fagetum* Ubaldi, Zanotti, Puppi, Speranza, Corbetta *ex* Ubaldi 1995 (Tab. 2, in Caputo, 1968 = *Aquifolio-Fagetum* Gentile 1969); *Serratulo tinctoriae-Quercetum petraeae* Ubaldi, Zanotti & Puppi 1993 (Tab. 2B, in Ubaldi, Zanotti & Puppi, 1993); *Seslerio autumnalis-Ostryetum* Horvat & Horvatić 1950 (Tab. 4, in: Bonin & Gamisans, 1976); *Seslerio italicae-Ostryetum* Ubaldi 1974 em. Ubaldi & Speranza 1982 (Tab. 4, in: Ubaldi & Speranza, 1982); *Sorbo torminalis-Quercetum virgilianae* Brullo, Minissale, Signorello & Spampinato 1996 (Tab. 3, in Brullo, Minissale, Signorello & Spampinato, 1996); *Stipo bromoidis-Quercetum frainetto* Abbate & Paura 1995 (Tab. 2, in Abbate & Paura, 1995); *Symphyto tuberosi-Castanetum sativae* Arrigoni & Viciani 2001 (Tab. 8, in: Arrigoni & Viciani, 2001); *Vicio cassubicae-Quercetum cerridis* Brullo & Marcenò 1985 (Tab. 17, in: Brullo & Marcenò, 1985); *Vicio elegantis-Quercetum congestae* Brullo & Marcenò 1985 (Tab. 15, in: Brullo & Marcenò, 1985); *Vinco-Quercetum cerridis* Ubaldi, Puppi, Zanotti, Speranza & Corbetta *ex* Ubaldi 1995 (Tab. 4, in: Alessandrini & Corbetta 1979 = *Physospermo-Quercetum petraeae*); *Vinco-Quercetum cerridis viburnetosum* Ubaldi, Puppi, Zanotti, Speranza & Corbetta *ex* Ubaldi 1995 (Tab. 4, in: Alessandrini & Corbetta 1979 = *Physospermo-Quercetum petraeae*); *Violo hirtae-Carpinetum orientalis* Taffetani & Biondi 1995 (Tab. 2, in: Taffetani & Biondi, 1995).Arrigoni & Viciani 2001); *Tilio-Quercetum cerridis* Ubaldi, Zanotti, Puppi, Speranza, Corbetta *ex* Ubaldi 1995 (Tab. 1, in Aita *et al.*, 1977 = *Physospermo verticillati-Quercetum cerridis* variant with *Ilex aquifolium*); *Vicio cassubicae-Quercetum congestae* Brullo & Marcenò 1985 (Tab. 15, in: Brullo & Marcenò, 1985); *Vicio elegantis-Quercetum congestae* Brullo & Marcenò 1985 (Tab. 15, in: Brullo & Marcenò, 1985); *Vinco-Quercetum cerridis* Ubaldi, Puppi, Zanotti, Speranza & Corbetta *ex* Ubaldi 1995 (Tab. 4, in: Alessandrini & Corbetta 1979 = *Physospermo-Quercetum petraeae*); *Vinco-Quercetum cerridis viburnetosum* Ubaldi, Puppi, Zanotti, Speranza & Corbetta *ex* Ubaldi 1995 (Tab. 4, in: Alessandrini & Corbetta 1979 = *Physospermo-Quercetum petraeae*); *Violo hirtae-Carpinetum orientalis* Taffetani & Biondi 1995 (Tab. 2, in: Taffetani & Biondi, 1995).

Tab. 1 - Laburno anagyroidis-Ostryenion carpinifoliae

1- Calamagrostio variae-Ostryetum carpinifoliae
2 - Aceri obtusati-Quercetum cerridis
3- Aceri obtusati-Quercetum cerridis serratuletosum tinctoriae
4- Aceri obtusati-Quercetum cerridis aceretosum monspessulani
5 - Seslerio italicae-Ostryetum carpinifoliae
6 - Scutellario columnae-Ostryetum carpinifoliae
7 - Melampyro italici-Ostryetum carpinifoliae
8 - Dryopterido filix maris-Ostryetum carpinifoliae
9 - Melittio - Ostryetum carpinifoliae
10- Corno maris-Ostryetum carpinifoliae
11 - Euphorbio phymatospermae-Ostryetum carpinifoliae
12 - Daphno laureolae-Quercetum cerridis
13 - Daphno laureolae Quercetum cerridis aceretosum obtusati
14 - Ostryo-Aceretum opulifolii

c = characteristic; d = differential; t = transgressive

	N. column	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	N. releves	13	16	29	22	9	45	8	12	22	12	15	5	3	20
	Laburno anagyroidis-Ostryenion carpinifoliae														
c	Lilium bulbiferum subsp. croceum	62	88	83	55	44	71	100	.	.	.	93	40	100	35
c	Laburnum anagyroides	62	.	38	.	.	33	63	25	68	75	13	.	.	65
c	Sanicula europaea	.	81	83	50	67	53	.	8	.	.	33	.	67	.
c	Helleborus bocconei subsp. bocconei	.	63	66	77	78	38	.	.	.	.	.	.	33	95
c	Digitalis lutea	54	31	.	.	56	.	.	34	.	8	.	.	.	15
c	Melampyrum italicum	.	.	10	27	.	13	63	.	.	.	.	.	33	.
d	Carex digitata	77	69	69	59	.	67	75	25	.	.	.	60	67	45
d	Polypodium gr. vulgare	31	31	21	32	.	29	.	58	.	.	.	20	.	45
d	Sesleria italica	.	38	.	14	100	.	.	.	.	.	.	.	.	.
d	Doronicum columnae	.	.	.	.	22	.	.	.	.	.	67	.	.	.
t	Hepatica nobilis	100	100	69	77	67	80	75	25	45	.	.	60	100	75
t	Lonicera xylosteum	100	75	86	73	89	93	63	33	23	.	.	.	100	75
t	Epipactis helleborine	38	.	7	.	89	16	88	8	.	8	27	.	67	20
t	Bromus ramosus	.	88	83	55	.	29	38	.	.	.	.	.	.	10
t	Calamintha sylvatica	.	13	7	41	.	73	.	.	.	.	.	.	100	.
t	Euonymus latifolius	.	.	.	.	.	24	.	25	.	.	7	.	33	65
t	Bunium bulbocastanum	.	19	.	.	.	.	.	.	23	8	.	.	.	.
t	Lilium martagon	.	.	.	.	.	20	.	.	.	.	53	.	33	.
t	Tilia platyphyllos	.	.	.	.	.	20	.	.	.	.	27	.	33	.
	Campanulo mediae-Ostryenion carpinifoliae														.
c	Luzula nivea	.	.	.	.	.	.	.	33	.	.	.	.	.	.
t	Acer opulifolium	100	.	.	.	.	.	.	25	.	.	.	.	.	65
c	Knautia drymeia	.	.	.	.	.	.	.	.	.	.	.	.	.	20
	Lauro nobilis-Quercenion pubescentis														.
c	Cyclamen repandum	.	31	76	86	.	76	.	.	.	25	7	100	100	.
c	Asparagus acutifolius	.	.	14	73	.	38	.	.	18	58	7	60	.	.
c	Cercis siliquastrum	.	.	7	27	.	4	.	.	.	.	.	.	.	.
c	Pistacia terebinthus	.	.	.	.	.	.	.	.	.	8	.	.	.	.
d	Rubia peregrina	.	.	14	77	.	249	.	.	.	33	.	20	.	.
d	Rosa sempervirens	.	.	7	23	.	.	.	.	.	.	.	.	.	.
d	Clematis flammula	.	.	.	.	.	.	.	.	.	17	.	.	.	.
d	Dryopteris pallida	.	.	.	.	.	.	.	.	.	.	33	.	.	.
d	Osyris alba	.	.	.	.	.	.	.	.	.	.	.	20	.	.
	Cytiso sessilifolii-Quercenion pubescentis														.
c	Cytisus sessilifolius	23	.	21	27	89	42	75	.	64	33	.	.	67	.
c	Juniperus oxycedrus	.	.	.	.	.	.	.	.	.	25	.	40	.	.
c	Inula salicina	.	.	.	14	.	.	.	.	.	.	.	.	.	.
d	Inula conyza	15	.	.	18	.	.	.	.	.	8	20	.	.	.
d	Helianthemum nummularium	.	.	.	.	.	.	.	.	27	.	.	.	.	.
d	Spartium junceum	.	.	.	.	.	.	.	.	5	.	.	.	.	.
	Carpinion orientalis														
c	Ostrya carpinifolia	100	100	100	100	100	100	100	83	91	92	100	60	100	100
c	Acer obtusatum	.	100	90	64	89	84	100	.	68	92	87	40	100	.
c	Carpinus orientalis	.	.	.	.	.	11	.	.	.	50	13	100	100	.
c	Campanula persicifolia	54	.	.	.	.	2	50	.	.	.	27	.	.	5
c	Colutea arborescens	.	.	.	.	22	9	.	.	18	.	.	.	33	.
c	Peucedanum verticillare	23	31	7	.	67	.	.	.	.	.	.	.	.	5
c	Cnidium silaifolium	.	.	7	41	.	33	.	.	.	.	.	.	.	5
c	Coronilla emerus subsp. emeroides	.	.	.	.	.	.	.	.	.	.	.	60	100	.
c	Sesleria autumnalis	.	.	.	.	.	.	.	75	.	.	93	.	.	.
d	Orchis purpurea	15	94	69	23	22	9	.	.	.	.	.	.	.	50
d	Cotinus coggygria	.	.	17	55	.	33	.	.	.	.	.	.	.	.
d	Dianthus monspessulanus	.	.	.	.	33	.	.	.	.	.	.	.	.	.
d	Silene italica subsp. nemoralis	.	.	.	50	.	.	.	.	.	.	.	.	.	.
d	Vicia grandiflora	.	.	.	.	22	.	.	.	.	.	.	.	.	.
t	Melittis melissophyllum	69	63	90	95	22	91	75	.	100	58	73	60	100	80
t	Acer monspessulanum	.	.	3	50	.	64	25	.	23	17	27	.	33	.

t	Arabis turrita	.	.	.	14	.	22	50	.	18	33	27	.	.	.
t	Staphylea pinnata	.	.	.	9	.	20	.	.	.	.	.	.	.	.
t	Saxifraga rotundifolia	.	.	.	.	.	.	.	8	.	.	.	.	.	.
t	Viola hirta	.	.	.	.	.	.	.	.	.	25	.	.	.	.
	Teucrio siculi-Quercion cerridis														
	Carex sylvatica	.	13	.	.	.	9	.	.	.	.	.	20	.	.
	Digitalis micrantha	.	.	.	27	.	67	.	33	18	.	60	.	.	15
	Ptilostemon strictus	.	.	.	.	.	.	38	.	.	.	.	.	.	.
	Teucrium siculum	.	.	.	.	.	.	.	.	.	.	13	.	.	.
	Veronica chamaedrys	.	.	.	.	44	.	.	.	.	.	.	.	.	.
	Mespilus germanica														25
	Erythronio-Quercion petraeae														
	Helleborus viridis	.	.	.	.	.	.	.	17	5	.	.	.	.	.
	Helleborus odorus subsp. laxus	92	.	.	.	.	.	.	.	.	.	.	.	.	.
	Lathyrus montanus	.	.	.	.	.	.	.	25	.	.	.	.	.	.
	Luzula pedemontana	.	.	.	.	.	.	.	8	.	.	.	.	.	.
	Polygonatum odoratum	.	.	.	.	.	.	38	.	.	.	.	.	.	.
	Teucrium scorodonia	.	.	.	.	.	.	.	17	.	.	.	.	.	.
	Physospermum cornubiense	.	.	.	.	.	.	.	.	.	.	.	.	.	25
	Quercion pubescenti-petraeae														
	Buxus sempervirens	.	.	.	.	.	7	.	.	.	.	.	.	.	.
	Quercetalia pubescenti-petraeae														
	Fraxinus ornus	100	100	97	100	44	100	100	83	77	100	87	100	100	100
	Quercus pubescens	100	44	86	91	100	87	100	25	5	100	40	100	67	90
	Quercus cerris	92	100	83	59	22	20	63	8	41	.	7	100	100	95
	Viola alba subsp. dehnhardtii	92	81	93	95	100	93	63	50	.	8	53	60	100	100
	Cornus mas	46	100	83	95	.	91	100	.	32	100	60	60	100	10
	Sorbus aria	.	31	7	32	.	91	63	.	32	17	53	20	100	.
	Brachypodium rupestre	77	94	76	77	100	.	75	75	.	33	7	.	.	55
	Buglossoides purpurocaerulea	15	19	59	82	.	60	.	.	32	17	.	60	100	.
	Sorbus domestica	31	50	62	64	.	29	50	.	.	.	7	60	100	30
	Sorbus torminalis	31	19	52	64	.	27	100	8	5	.	.	.	100	80
	Helleborus foetidus	.	.	.	5	22	38	50	.	59	.	53	.	33	.
	Stachys officinalis	.	38	69	73	.	24	25	.	.	.	.	20	100	5
	Silene italica subsp. italica	31	.	.	.	33	40	.	.	41	25	.	.	100	.
	Hypericum montanum	31	.	.	.	.	20	25	.	.	.	13	.	33	.
	Lonicera etrusca	.	.	.	23	.	.	50	.	.	25	60	.	.	.
	Scutellaria columnae	.	.	.	.	.	47	.	.	36	.	33	.	.	.
	Serratula tinctoria	.	.	66	32	.	.	.	.	.	.	.	.	33	10
	Aristolochia lutea	.	.	.	.	.	.	.	.	55	.	93	.	.	.
	Lathyrus niger	.	.	52	23	.	.	.	.	.	.	.	.	.	25
	Arum italicum	.	.	.	.	.	40	.	.	.	.	27	.	.	.
	Agrimonia eupatoria	.	.	.	.	.	.	.	.	23	.	.	.	.	.
	Limodorum abortivum	.	.	.	.	.	4	.	.	.	.	.	.	.	.
	Asparagus tenuifolius	.	.	.	.	.	.	.	.	.	.	.	.	.	5
	Fagetalia sylvaticae														
	Fagus sylvatica	23	25	7	5	33	27	50	50	9	17	.	.	.	.
	Euphorbia dulcis	77	50	66	14	56	56	.	17	.	.	27	20	.	95
	Lathyrus vernus	.	.	24	23	11	.	.	.	5	.	.	20	.	.
	Dactylorhiza maculata	.	94	45	.	.	27	25	8	.	.	.	.	.	.
	Anemone trifolia	.	81	90	73	56	.	.	.	.	.	.	.	.	.
	Arum maculatum	.	.	.	27	.	.	.	.	14	17	13	.	.	.
	Mercurialis perennis	.	.	.	14	.	33	38	.	.	.	40	.	.	.
	Salvia glutinosa	54	13	.	.	.	11	.	33	.	.	.	.	.	.
	Cephalanthera rubra	.	.	7	.	78	.	25	.	.	.	.	.	.	.
	Geranium nodosum	.	13	21	.	.	.	.	50	.	.	.	.	.	5
	Poa nemoralis	.	.	.	.	.	7	.	17	32	.	.	.	.	.
	Polygonatum multiflorum	.	.	.	.	.	4	.	.	59	.	27	.	.	.
	Vicia sepium	.	19	7	.	.	.	.	.	.	.	47	.	.	.
	Galium odoratum	.	.	.	.	.	11	.	.	.	.	.	40	.	.
	Geranium robertianum	.	.	.	.	.	29	.	33	.	.	.	.	.	.
	Ornithogalum pyrenaicum	.	.	.	.	.	16	.	.	.	.	13	.	.	.
	Stellaria holostea	.	.	.	.	.	18	.	.	.	.	7	.	.	.
	Abies alba	.	.	.	.	.	.	.	8	.	.	.	.	.	
	Acer platanoides	.	.	.	.	.	9	.	.	.	.	.	.	.	.
	Acer pseudoplatanus	.	.	.	.	.	.	.	25	.	.	.	.	.	.
	Adoxa moschatellina	.	.	.	.	.	.	.	.	.	.	27	.	.	.
	Asarum europaeum	.	.	.	.	.	.	.	8	.	.	.	.	.	.
	Cardamine chelidonia	.	.	.	.	.	.	.	.	23	.	.	.	.	.
	Anemone nemorosa	.	.	.	.	.	.	.	.	.	.	27	.	.	10
	Corydalis cava	.	.	.	.	.	.	.	.	.	.	33	.	.	.
	Fraxinus excelsior	.	.	.	.	.	.	.	.	18	.	.	.	.	.
	Gagea lutea	.	.	.	.	.	.	.	.	.	.	47	.	.	.
	Lamiastrum galeobdolon	.	.	.	.	.	.	.	17	.	.	.	.	.	.
	Luzula pilosa	.	.	.	.	.	.	.	.	36	.	.	.	.	.
	Melampyrum nemorosum	.	.	.	.	.	.	.	.	.	.	.	40	.	.
	Scilla bifolia	.	.	.	.	.	.	.	.	.	.	80	.	.	.
	Sorbus aucuparia	.	.	.	.	.	.	.	.	14	.	.	.	.	.
	Ulmus glabra	.	.	.	.	.	9	.	.	.	.	.	.	.	.
	Quercetalia robori-petraeae														
	Erythronium dens canis	85	.	.	.	.	.	.	.	.	.	.	.	.	.
	Calluna vulgaris	.	.	.	.	.	.	.	17	.	.	.	.	.	.
	Deschampsia flexuosa	.	.	.	.	.	.	.	.	23	.	.	.	.	.
	Populetalia albae														
	Salix caprea	.	.	.	.	.	.	.	17	.	.	.	.	.	.
	Populus tremula	.	.	.	.	.	.	.	.	.	.	.	20	.	.

Querco-Fagetea														
Melica uniflora	46	50	34	59	44	87	88	67	50	75	47	60	100	30
Tamus communis	31	88	90	82	67	78	75	25	64	92	27	20	100	30
Viola riviniana+reichenbachiana	85	88	90	82	100	62	88	42	9	67	33	40	67	90
Campanula trachelium	54	44	24	14	33	73	88	25	55	42	47	.	67	.
Fragaria vesca	92	100	24	45	33	84	63	50	77	.	93	60	100	40
Acer campestre	85	75	41	68	67	82	63	25	32	.	20	.	100	100
Corylus avellana	100	25	72	50	100	73	63	67	41	.	.	100	100	95
Cruciata glabra	77	75	66	77	44	78	100	83	.	17	.	60	67	50
Daphne laureola	100	25	31	68	67	89	25	100	.	42	.	60	100	65
Festuca heterophylla	46	50	31	36	44	71	63	75	.	.	53	100	100	30
Hedera helix	69	94	100	.	56	89	50	67	27	.	67	60	100	90
Lathyrus venetus	15	94	69	73	22	69	75	25	68	.	87	.	100	25
Lonicera caprifolium	23	100	97	68	89	42	50	25	68	.	.	100	100	85
Primula vulgaris	100	94	69	77	100	73	88	33	55	.	.	40	100	90
Ajuga reptans	31	63	41	55	.	53	50	8	.	.	60	20	33	5
Carpinus betulus	54	38	41	23	.	33	38	33	9	.	.	20	67	10
Cephalanthera damasonium	85	31	28	32	89	33	63	.	9	.	20	.	67	65
Cephalanthera longifolia	31	31	34	45	33	16	25	.	9	25	.	.	33	.
Clematis vitalba	31	50	10	32	44	47	25	17	45	.	7	.	.	65
Solidago virgaurea	85	100	79	45	78	73	88	17	.	.	13	.	67	60
Brachypodium sylvaticum	.	.	31	32	.	60	.	.	18	17	73	40	67	5
Euphorbia amygdaloides	.	.	52	41	11	64	.	.	5	33	20	.	100	30
Luzula forsteri	38	50	14	36	.	42	.	33	.	.	.	20	100	.
Potentilla micrantha	92	19	.	27	.	40	75	33	.	.	40	.	33	5
Prunus avium	92	75	52	41	67	18	25	92	.	.	.	.	.	55
Rosa arvensis	77	100	76	9	44	.	63	.	.	.	100	.	.	30
Ruscus aculeatus	.	.	93	82	.	78	.	.	23	58	.	40	67	35
Malus sylvestris	.	19	.	.	33	38	38	8	.	.	.	.	67	5
Castanea sativa	92	.	24	14	.	.	25	92	.	.	.	60	.	45
Cyclamen hederifolium	.	.	10	27	.	.	.	25	.	25	47	20	.	25
Geum urbanum	.	.	.	32	.	69	.	17	36	.	33	.	100	5
Mycelis muralis	15	.	.	.	.	16	.	25	14	17	47	.	.	.
Luzula sylvatica	.	.	.	.	.	27	63	.	27	8	47	.	.	10
Aremonia agrimonoides	.	25	.	.	.	.	38	.	27	17	60	.	.	.
Hieracium gr. murorum	.	63	34	.	33	33	.	.	9	.	.	.	.	.
Neottia nidus-avis	54	.	.	.	.	18	25	.	.	.	.	20	100	.
Pulmonaria apennina	.	38	48	.	11	2	.	25	.	.	.	.	.	55
Rubus hirtus	15	.	.	.	.	76	.	58	.	.	87	.	67	.
Symphytum tuberosum	100	.	.	.	44	.	.	8	5	.	.	20	.	30
Hieracium sylvaticum	85	.	.	18	.	.	.	42	.	.	.	40	.	15
Ilex aquifolium	.	.	.	.	.	11	.	8	.	8	.	40	.	.
Genista tinctoria	.	.	.	.	33	.	.	.	.	.	.	20	33	.
Listera ovata	15	81	24	.	.	.	.	.	.	.	.	.	.	.
Platanthera clorantha	62	19	.	.	.	.	38	.	.	.	.	.	.	.
Anemone apennina	.	.	.	.	.	16	.	.	77	.	67	.	.	.
Cardamine bulbifera	.	.	.	.	.	31	.	.	9	.	.	.	33	.
Cardamine graeca	.	.	.	.	.	44	.	.	.	.	73	.	33	.
Dryopteris filix-mas	.	.	.	.	.	2	.	67	.	.	13	.	.	.
Polystichum setiferum	.	.	.	5	.	27	.	.	.	.	7	.	.	.
Ranunculus nemorosus	.	19	.	23	44	.	.	.	.	.	.	.	.	.
Ulmus minor	.	13	10	.	.	4	.	.	.	.	.	.	.	.
Ranunculus lanuginosus	.	.	.	.	.	2	.	.	9	.	.	.	.	.
Quercus petraea	.	.	.	.	.	.	13	.	91	.	.	.	.	5
Allium pendulinum	.	.	.	.	.	13	.	.	.	.	80	.	.	.
Galanthus nivalis	.	.	.	.	.	2	.	.	.	.	80	.	.	.
Hieracium sabaudum	38	.	.	.	.	.	38	.	.	.	.	.	.	.
Hieracium racemosum	.	.	.	.	.	.	.	42	.	.	.	.	.	.
Aristolochia rotunda	.	.	.	.	.	.	.	.	.	8	.	.	.	.
Hieracium lachenalii	.	.	.	.	.	.	.	.	.	.	20	.	.	.
Platanthera bifolia	.	.	.	.	.	.	.	.	.	.	.	20	.	.
Viola odorata	.	.	.	.	.	.	.	.	55	.	.	.	.	.
Aquilegia vulgaris	.	.	.	.	.	18	.	.	.	.	.	.	.	.
Rhamno-Prunetea														
Crataegus monogyna	100	94	76	82	89	100	.	75	64	.	93	40	100	95
Rosa canina	23	31	10	27	67	82	25	67	9	.	33	.	100	10
Cornus sanguinea	23	100	97	82	78	16	75	.	41	100	.	.	67	.
Coronilla emerus	100	88	97	86	78	91	75	42	5	75	.	.	.	95
Juniperus communis	54	81	55	45	67	40	38	42	5	.	.	20	.	50
Euonymus europaeus	.	31	38	45	22	58	38	.	.	.	67	40	33	.
Rubus ulmifolius	31	50	38	68	33	.	.	42	41	17	13	.	.	25
Crataegus laevigata	62	81	62	50	67	18	75	.	.	.	60	.	.	25
Prunus spinosa	.	44	28	68	.	71	25	.	27	.	.	.	100	5
Ligustrum vulgare	.	13	48	41	.	69	.	.	.	.	.	100	100	65
Viburnum lantana	69	.	3	.	78	4	25	.	.	.	.	.	.	90
Pyrus pyraster	15	38	.	.	44	.	.	8	.	.	.	.	.	.
Pyracantha coccinea	.	31	62	.	.	.	.	.	.	.	.	60	.	35
Rubus canescens	.	.	.	9	.	.	.	.	.	.	.	40	33	.
Prunus mahaleb	.	.	.	.	.	22	25	.	.	.	.	.	.	.
Cytisus scoparius	.	.	.	.	.	.	.	25	.	.	.	.	.	.
Euonymus verrucosus	.	.	.	.	.	.	25	.	.	.	.	.	.	.
Rosa agrestis	.	.	.	.	.	.	.	.	.	.	.	.	100	.
Rosa gallica	.	.	.	.	.	.	.	.	55	.	.	.	.	.
Viburnum opulus	.	.	.	18	.	.	.	.	.	.	.	.	.	.
Quercetea ilicis														
Quercus ilex	.	.	.	36	.	53	.	.	.	25	7	60	.	.
Rhamnus alaternus	.	.	.	9	.	.	.	.	.	.	.	.	.	.
Asplenium onopteris	.	.	.	.	.	.	.	.	.	.	47	.	.	.

Other species

Dactylis glomerata	46	50	38	59	56	78	25	17	64	8	20	.	100	.
Pteridium aquilinum	46	25	21	27	33	20	.	42	5	25	.	20	33	10
Carex flacca	62	88	100	82	78	58	63	.	.	8	.	.	100	75
Teucrium chamaedrys	15	.	.	.	33	20	.	17	50	8	.	.	33	.
Clinopodium vulgare	31	13	.	.	67	.	50	25	.	.	.	.	.	25
Asplenium adiantum-nigrum	.	.	.	41	.	24	.	33	.	.	.	.	.	.
Asplenium trichomanes	.	.	.	.	.	.	.	.	45	25	7	.	.	.
Astragalus glycyphyllos	.	31	7	.	67	.	.	.	.	.	.	.	.	.
Ranunculus bulbosus	.	.	.	18	.	.	.	.	27	8	.	.	.	.
Saxifraga granulata	.	.	.	.	.	.	.	.	5	33	20	.	.	.
Agrostis tenuis	15	.	.	.	.	.	.	50	.	.	.	.	.	.
Arabis collina	.	.	.	.	.	.	.	.	36	8	.	.	.	.
Bromus erectus	.	.	.	.	22	.	.	.	9	.	.	.	.	.
Calamintha nepeta	.	.	.	.	.	.	.	.	41	8	.	.	.	.
Cerastium arvense	.	.	.	.	.	.	.	.	45	8	.	.	.	.
Ceterach officinarum	.	.	.	.	.	.	.	.	27	50	.	.	.	.
Cruciata laevipes	.	.	.	.	.	.	.	.	82	8	.	.	.	.
Galium verum subsp. verum	.	.	.	.	.	.	.	.	27	8	.	.	.	.
Geranium purpureum	.	.	.	9	.	.	.	.	.	.	67	.	.	.
Ornithogalum umbellatum	.	.	.	.	.	.	.	.	.	.	7	.	33	.
Stellaria media	.	.	.	.	.	.	.	.	18	17	.	.	.	.
Tanacetum corymbosum	.	.	.	.	.	27	.	.	.	.	.	.	33	.
Veratrum nigrum	.	.	.	5	.	24	.	.	.	.	.	.	.	.
Aegopodium podagraria	.	.	.	.	.	.	.	8	.	.	.	.	.	.
Alliaria petiolata	.	.	.	.	.	.	.	.	.	.	47	.	.	.
Anacamptis pyramidalis	.	.	.	.	.	.	.	.	.	.	.	.	33	.
Arabis hirsuta	.	.	.	.	.	.	.	.	.	25	.	.	.	.
Asperula purpurea	.	.	.	.	.	.	.	.	14	.	.	.	.	.
Calamagrostis varia	85	.	.	.	.	.	.	.	.	.	.	.	.	.
Campanula glomerata	.	.	.	.	22	.	.	.	.	.	.	.	.	.
Carex hirta	.	.	.	.	.	.	.	.	9	.	.	.	.	.
Carex humilis	.	.	.	.	.	.	.	.	.	.	20	.	.	.
Carlina vulgaris	.	.	.	.	.	.	.	.	.	17	.	.	.	.
Cirsium arvense	.	.	.	.	.	.	.	.	.	58	.	.	.	.
Coeloglossum viride	.	.	.	.	.	.	.	.	.	.	27	.	.	.
Coronilla varia	.	.	.	.	.	.	.	.	14	.	.	.	.	.
Crocus suaveolens	.	.	.	.	.	.	.	.	.	.	87	.	.	.
Daucus carota	.	.	.	.	.	.	.	.	50	.	.	.	.	.
Dorycnium pentaphyllum	.	.	.	.	.	.	.	.	9	.	.	.	.	.
Epilobium montanum	.	.	.	.	.	.	.	17	.	.	.	.	.	.
Eryngium amethystinum	.	.	.	.	.	.	.	.	.	8	.	.	.	.
Euphorbia phymatosperma subsp. cernua	.	.	.	.	.	.	.	.	.	.	53	.	.	.
Fallopia dumetorum	50	.	.	.	.	.	.	.	.	.	.	.	.	.
Galium mollugo	.	.	.	.	.	.	.	.	9	.	.	.	.	.
Glechoma hirsuta	.	.	.	.	.	27	.	.	.	.	.	.	.	.
Hypericum perforatum	.	.	.	.	.	.	.	.	32	.	.	.	.	.
Lamium garganicum subsp. laevigatum	.	.	.	.	.	.	.	.	.	.	40	.	.	.
Leontodon cichoraceus	.	.	.	.	.	.	.	.	.	.	20	.	.	.
Leucanthemum vulgare	.	.	.	.	33	.	.	.	.	.	.	.	.	.
Linum viscosum	.	.	.	.	33	.	.	.	.	.	.	.	.	.
Lotus corniculatus	.	.	.	.	.	.	.	.	45	.	.	.	.	.
Medicago lupulina	.	.	.	.	.	.	.	.	14	.	.	.	.	.
Muscari botryoides	.	.	.	.	.	.	.	.	.	.	13	.	.	.
Narcissus poeticus	.	.	.	.	.	.	.	.	.	.	27	.	.	.
Odontites lutea	.	.	.	.	.	.	.	.	5	.	.	.	.	.
Orchis mascula	.	31	.	.	.	.	.	.	.	.	.	.	.	.
Orchis simia	23	.	.	.	.	.	.	.	.	.	.	.	.	.
Pimpinella major	.	.	.	.	22	.	.	.	.	.	.	.	.	.
Pinus sylvestris	.	.	.	.	.	.	.	.	.	.	.	.	.	5
Polygala vulgaris	.	.	.	.	.	.	.	.	32	.	.	.	.	.
Prunella vulgaris	.	.	.	.	.	.	.	.	5	.	.	.	.	.
Ranunculus ficaria	.	.	.	.	.	.	.	.	.	.	53	.	.	.
Romulea bulbocodium	.	.	.	.	.	.	.	.	.	.	7	.	.	.
Rumex acetosa	.	.	.	.	.	.	.	.	.	.	27	.	.	.
Sanguisorba minor	.	.	.	.	.	.	.	.	32	.	.	.	.	.
Scabiosa columbaria	.	.	.	.	.	.	.	.	.	8	.	.	.	.
Scutellaria rubicunda subsp. linnaeana	.	.	.	.	.	.	.	.	.	25	.	.	.	.
Sedum sediforme	.	.	.	.	.	.	.	.	14	.	.	.	.	.
Seseli montanum	.	.	.	.	.	.	.	.	.	.	27	.	.	.
Sesleria apennina	.	.	.	.	.	.	.	.	.	17	.	.	.	.
Sesleria nitida	.	.	.	.	.	.	88	.	.	.	.	.	.	.
Silene vulgaris	.	.	.	.	.	.	.	.	14	.	.	.	.	.
Thymus gr. serpyllum	.	.	.	.	.	.	.	.	14	.	.	.	.	.
Trifolium medium	.	.	.	.	22	.	.	.	.	.	.	.	.	.
Trifolium montanum	.	.	.	.	.	.	.	.	23	.	.	.	.	.
Trifolium pratense	.	.	.	.	.	.	.	.	55	.	.	.	.	.
Trifolium rubens	.	.	.	.	.	.	.	.	.	.	.	.	33	.
Veratrum album subsp. lobelianum	.	.	.	.	.	.	.	.	50	.	.	.	.	.
Veronica officinalis	.	.	.	.	.	.	.	17	.	.	.	.	.	.
Vincetoxicum hirundinaria	.	.	.	5	.	.	.	.	.	.	.	.	.	10
Viola cassinensis	.	.	.	.	.	.	.	.	.	.	60	.	.	.
Viola suavis	.	.	.	.	.	.	.	.	.	.	33	.	.	.
Galium aparine	.	.	.	.	.	.	.	.	.	.	.	.	.	10

Tab. 2 - Campanulo mediae-Ostryenion carpinifoliae

1 - Fraxino excelsiori-Ostryetum
2 - Orno-Quercetum pubescentis
3 - Plagio-Ostryetum campanuletosum persicifoliae
4 - Plagio- Ostryetum cotinetosum coggygriae
5 - Ostryo-Campanuletum persicifoliae
6 - Asplenio-Ostryetum
7 - Roso caninae-Ostryetum
8 - Knautio drymeiae-Ostryetum sorbetosum ariae
9 - Knautio drymeiae-Ostryetum viburnetosum

c = characteristic; d = differential; t = transgressive

	N. column	1	2	3	4	5	6	7	8	9
	N. releves	5	7	12	11	4	6	10	32	28
	Campanulo mediae-Ostryenion carpinifoliae									
c	Buphtalmum salicifolium	80	57	33	64	.	83	70	3	3
c	Campanula medium	60	100	42	.	50	100	100	.	.
c	Luzula nivea	60	.	58	.	25	.	30	25	6
c	Knautia drymeia	.	.	.	.	.	.	.	41	50
c	Leucanthemum discoideum	.	.	50	9	.	.	.	.	.
d	Lathyrus pratensis	.	.	33	18	25	.	30	28	6
t	Acer opulifolium	80	14	33	45	50	83	80	100	13
t	Pulmonaria affinis	.	.	.	.	.	33	20	.	.
	Laburno anagyroidis-Ostryenion carpinifoliae									
c	Laburnum anagyroides	.	.	.	.	.	67	40	94	22
c	Digitalis lutea	.	29	.	.	25	.	.	41	.
c	Lilium bulbiferum subsp. croceum	.	.	.	.	.	17	.	41	22
c	Melampyrum italicum	.	.	.	.	.	.	.	9	.
d	Carex digitata	.	.	.	.	.	.	.	38	25
d	Polypodium gr. vulgare	.	.	.	.	.	.	20	.	.
t	Hepatica nobilis	100	29	8	9	50	.	50	63	63
t	Lonicera xylosteum	60	14	.	.	.	17	.	9	.
t	Epipactis helleborine	.	.	.	.	50	.	.	75	69
t	Bromus ramosus	.	.	.	.	.	.	.	6	.
t	Lilium martagon	.	.	17	.	.	.	.	.	.
t	Tilia platyphyllos	.	.	.	.	.	.	.	44	.
	Lauro nobilis-Quercenion pubescentis									
c	Asparagus acutifolius	.	43	.	.	.	67	.	.	.
d	Rubia peregrina	.	29	.	27	.	50	.	.	.
d	Dorycnium hirsutum	.	29	.	.	.	.	.	.	.
	Cytiso sessilifolii-Quercenion pubescentis									
c	Cytisus sessilifolius	100	43	.	.	50	17	20	66	72
c	Juniperus oxycedrus	.	43	.	18	.	33	.	.	.
c	Peucedanum cervaria	.	.	.	.	.	33	.	22	25
c	Chamaecytisus hirsutus	.	.	.	.	.	.	.	13	28
c	Inula salicina	.	.	.	.	.	.	.	.	25
d	Carex hallerana	.	.	.	.	.	.	.	28	19
d	Spartium junceum	.	57	.	.	.	67	.	.	.
	Carpinion orientalis									
c	Ostrya carpinifolia	120	.	92	109	100	100	100	100	63
c	Campanula persicifolia	.	14	33	.	.	17	50	.	.
c	Sesleria autumnalis	.	14	.	.	75	50	100	.	.
c	Cnidium silaifolium	.	.	.	.	.	.	.	6	9
c	Peucedanum verticillare	.	.	.	.	.	.	.	38	22
d	Cotinus coggygria	.	.	.	91	.	.	.	.	9
d	Dianthus monspessulanus	.	.	.	.	.	.	.	19	.
t	Melittis melissophyllum	60	43	17	9	75	67	60	44	56
t	Arabis turrita	.	.	.	.	.	.	.	22	6
t	Viola hirta	.	.	.	.	.	.	.	78	56
t	Saxifraga rotundifolia	.	.	.	.	25	.	.	.	.
	Teucrio siculi-Quercion cerridis									
	Erica arborea	.	29	25	27	25	67	.	.	.
	Digitalis micrantha	.	.	25	.	100	.	.	.	.
	Cytisus villosus	.	.	.	.	.	17	.	.	.
	Erythronio-Quercion petraeae									
	Lathyrus montanus	.	.	33	55	.	.	.	9	6
	Physospermum cornubiense	.	14	.	.	.	67	.	22	13
	Helleborus viridis	.	.	.	.	.	.	40	6	.
	Genista germanica	.	.	.	.	.	.	.	.	6
	Luzula pedemontana	.	.	.	.	25	.	.	.	.
	Polygonatum odoratum	.	.	.	.	.	.	.	.	25

Quercion pubescenti-petraeae									
Primula veris	.	.	.	.	.	17	30	69	13
Buxus sempervirens	20	.	.	9	.	.	.	.	.
Catananche coerulea	.	.	8	9	.	.	.	.	.
Quercetalia pubescenti-petraeae									
Brachypodium rupestre	40	86	33	9	50	100	90	100	59
Fraxinus ornus	100	100	17	73	75	100	100	100	88
Quercus pubescens	100	100	58	64	50	83	80	94	81
Hypericum montanum	.	43	17	18	75	50	80	22	.
Helleborus foetidus	.	29	8	55	50	.	30	22	28
Sorbus aria	60	29	42	.	50	33	30	72	.
Quercus cerris	.	57	.	.	50	.	50	91	28
Buglossoides purpurocaerulea	.	43	.	.	.	17	.	22	56
Aristolochia lutea	.	57	.	.	.	17	30	.	.
Cornus mas	.	29	.	.	.	.	.	19	16
Lonicera etrusca	.	.	.	.	.	17	10	.	13
Serratula tinctoria	.	.	.	.	.	17	20	.	9
Stachys officinalis	.	.	.	.	.	17	.	22	9
Asparagus tenuifolius	.	.	.	.	.	.	.	16	22
Peucedanum oroselinum	.	29	.	.	.	17	.	.	.
Sorbus torminalis	.	14	.	.	.	.	.	.	19
Lathyrus niger	.	.	.	.	.	.	.	16	16
Silene italica subsp. italica	.	.	.	.	.	.	.	.	16
Fagetalia sylvaticae									
Euphorbia dulcis	80	14	50	36	50	.	20	69	44
Geranium nodosum	60	14	33	27	75	.	30	44	9
Cephalanthera rubra	.	14	17	.	100	33	50	41	41
Fagus sylvatica	40	.	.	.	100	.	.	28	.
Geranium robertianum	.	.	.	27	.	.	.	6	3
Mercurialis perennis	.	14	.	.	.	.	30	.	19
Poa nemoralis	.	.	.	.	25	.	30	.	6
Anemone trifolia	.	.	.	.	50	33	40	.	.
Dactylorhiza maculata	20	.	.	.	.	.	.	6	.
Fraxinus excelsior	80	.	.	18	.	.	.	.	.
Lathyrus vernus	.	.	.	.	.	.	.	19	3
Monotropa hypopitys	.	.	.	.	.	.	.	3	13
Prenanthes purpurea	.	.	.	.	25	.	.	6	.
Salvia glutinosa	.	.	.	.	50	.	.	.	6
Senecio nemorensis	.	.	8	9	.	.	.	.	.
Abies alba	.	.	33	.	.	.	.	.	.
Acer pseudoplatanus	.	.	.	.	.	.	.	25	.
Anemone ranunculoides	.	.	17	.	.	.	.	.	.
Melampyrum nemorosum	.	.	.	.	25	.	.	.	.
Vicia sepium	.	.	.	.	.	17	.	.	.
Quercetalia robori-petraeae									
Deschampsia flexuosa	.	.	42	9	.	.	.	9	.
Genista pilosa	.	.	17	.	25	.	20	.	.
Populetalia albae									
Alnus incana	.	.	.	.	25	.	.	.	.
Rubus caesius	.	.	.	.	.	.	.	.	9
Querco-Fagetea									
Acer campestre	60	86	25	18	50	50	60	88	41
Corylus avellana	100	14	58	36	75	67	30	94	84
Castanea sativa	40	.	25	91	25	83	40	63	28
Fragaria vesca	.	14	50	36	25	17	70	47	22
Clematis vitalba	.	43	8	64	.	67	30	69	69
Daphne laureola	.	.	33	27	75	33	40	9	38
Euphorbia amygdaloides	.	43	8	18	.	17	40	3	13
Hedera helix	.	57	.	45	25	50	30	3	28
Viola riviniana+reichenbachiana	.	29	17	18	.	33	40	47	69
Brachypodium sylvaticum	60	.	17	55	50	.	10	.	13
Mycelis muralis	.	.	17	9	50	.	10	6	3
Tamus communis	.	57	17	73	.	50	.	34	28
Carpinus betulus	60	14	.	.	50	.	.	34	3
Festuca heterophylla	.	.	58	36	50	.	.	6	13
Campanula trachelium	.	14	.	.	.	.	30	72	41
Cephalanthera longifolia	.	14	.	.	50	.	.	41	13
Cruciata glabra	.	.	.	.	75	.	50	47	25
Dryopteris filix-mas	20	.	.	.	.	.	30	3	3
Hieracium gr. murorum	.	.	42	18	.	33	20	.	.
Melica uniflora	.	.	.	18	.	.	20	13	16
Pulmonaria officinalis	.	.	25	27	.	.	.	69	6
Calamintha grandiflora	20	.	17	9	.	.	.	.	.
Cephalanthera damasonium	.	.	.	.	50	.	.	28	25
Lathyrus sylvestris	.	29	.	.	25	.	.	25	.
Platanthera bifolia	20	.	17	.	50	.	.	.	.
Potentilla micrantha	.	.	.	.	.	.	50	63	3
Prunus avium	.	.	.	18	.	.	.	63	34
Rosa arvensis	.	14	.	.	.	.	.	81	81
Solidago virgaurea	.	14	.	.	.	.	.	72	69

Symphytum tuberosum	.	.	25	.	25	.	.	.	9
Malus sylvestris	.	.	.	.	.	.	.	88	13
Platanthera clorantha	.	.	.	.	.	.	.	16	25
Ajuga reptans	.	.	.	.	.	.	.	3	13
Aremonia agrimonoides	.	.	.	.	.	.	.	3	3
Cyclamen hederifolium	.	29	.	.	.	.	50	.	.
Hieracium sabaudum	.	.	.	.	.	.	.	3	3
Hieracium sylvaticum	.	.	.	.	.	.	.	66	44
Lonicera caprifolium	.	14	.	.	.	.	.	.	72
Neottia nidus-avis	.	.	.	.	.	.	.	22	6
Genista tinctoria	.	.	.	.	.	.	.	19	6
Primula vulgaris	.	.	.	.	.	.	.	41	59
Ruscus aculeatus	.	29	.	.	.	33	.	.	.
Mespilus germanica	.	.	.	.	.	.	.	.	9
Listera ovata	.	.	.	.	25	.	.	.	.
Luzula sylvatica	.	.	.	.	.	.	20	.	.
Geum urbanum	.	.	.	.	.	.	.	.	9
Ilex aquifolium	.	.	.	.	25	.	.	.	.
Myosotis sylvatica	.	.	.	.	25	.	.	.	.
Ranunculus nemorosus	.	.	.	.	.	.	20	.	.
Silene nutans	.	.	.	.	.	33	.	.	.
Ulmus minor	80	.	.	.	.	.	.	.	.
Rhamno-Prunetea and Cytisetea scopario-striati									
Coronilla emerus	100	71	33	82	100	100	90	84	81
Crataegus monogyna	60	71	58	73	25	50	70	84	84
Cornus sanguinea	.	71	17	91	.	100	30	28	81
Juniperus communis	.	57	17	45	25	17	.	56	72
Viburnum lantana	60	43	8	.	75	33	80	.	81
Ligustrum vulgare	.	43	.	.	.	17	30	.	50
Rosa canina	.	.	.	.	25	.	50	25	28
Crataegus laevigata	.	.	.	.	.	.	.	13	3
Cytisus scoparius	.	14	.	.	50	.	.	.	.
Genista cinerea	.	.	42	9	.	.	.	.	.
Prunus mahaleb	.	.	.	.	.	17	.	.	3
Prunus spinosa	.	.	.	.	.	.	.	56	53
Pyrus pyraster	.	.	.	.	.	.	.	66	53
Rhamnus catharticus	.	.	.	.	.	.	.	9	25
Rubus canescens	.	.	.	27	.	33	.	.	.
Rubus gr. corylifolii	.	.	.	.	.	.	.	9	13
Amelanchier ovalis	.	.	.	.	.	17	.	.	.
Coriaria myrtifolia	.	.	.	55	.	.	.	.	.
Rosa gallica	.	.	.	.	.	.	.	.	9
Rosa glauca	.	.	33	.	.	.	.	.	.
Rubus idaeus	.	.	.	.	.	.	.	9	.
Rubus saxatilis	.	.	.	.	.	.	20	.	.
Sambucus nigra	.	.	.	18	.	.	.	.	.
Quercetea ilicis									
Calicotome spinosa	.	.	8	27	.	.	.	.	.
Quercus ilex	.	.	25	.	.	17	.	.	.
Smilax aspera	.	29	.	.	.	50	.	.	.
Carex divulsa	.	.	.	.	.	.	20	.	.
Other species									
Teucrium chamaedrys	80	71	25	45	.	50	30	47	47
Tanacetum corymbosum	100	43	.	18	.	17	10	53	3
Clinopodium vulgare	.	.	17	18	.	.	30	63	16
Dactylis glomerata	.	.	25	45	.	.	20	41	22
Geranium sanguineum	40	.	42	36	.	17	20	.	.
Pteridium aquilinum	.	.	58	73	.	33	50	.	9
Vicia sativa	.	29	42	36	.	17	20	.	.
Astragalus monspessulanus	.	.	25	45	.	.	.	3	6
Bromus erectus	.	14	17	36	.	.	.	6	.
Galium mollugo	60	.	17	36	.	17	.	.	.
Silene vulgaris	.	.	.	.	25	17	20	16	.
Vincetoxicum hirundinaria	.	29	.	.	.	.	.	16	31
Carex flacca	.	14	.	.	.	.	.	38	72
Coronilla varia	.	.	17	27	.	.	.	6	.
Dorycnium pentaphyllum subsp.suffruticosum	.	29	17	27	.	.	.	.	.
Galium aristatum	80	.	.	.	25	.	.	13	.
Leucanthemum vulgare	60	.	17	36	.	.	.	.	.
Robinia pseudoacacia	.	.	8	45	.	.	.	.	6
Pinus sylvestris	.	.	83	9	.	.	.	.	.
Achillea millefolium	.	.	25	18	.	.	.	.	.
Aegopodium podagraria	.	.	.	.	.	.	.	22	3
Anthericum liliago	.	14	.	.	.	.	.	.	9
Anthyllis vulneraria	.	.	25	45	.	.	.	.	.
Astragalus glycyphyllos	.	.	33	18	.	.	.	.	.
Briza media	.	.	.	.	.	17	20	.	.
Calamagrostis lasiagrostis	.	.	25	27	.	.	.	.	.
Calamagrostis varia	.	.	.	.	.	.	.	41	13
Cephalaria leucantha	.	29	.	.	.	33	.	.	.
Cirsium erisithales	.	.	17	9	.	.	.	.	.
Euphorbia cyparissias	.	14	.	.	.	.	.	.	28

Festuca gr. ovina	.	.	.	.	.	.	.	9	3
Festuca tenuifolia	.	.	17	27	.	.	.	.	.
Galium lucidum	.	.	.	.	.	.	.	28	13
Helianthemum apenninum	.	.	17	9	.	.	.	.	.
Lathyrus latifolius	.	.	.	.	.	.	.	3	9
Lavandula angustifolia	.	.	25	45	.	.	.	.	.
Lotus corniculatus	60	29	.	.	.	.	.	.	.
Ononis spinosa	.	29	.	.	.	17	.	.	.
Orchis mascula	.	.	.	.	.	.	.	9	3
Pimpinella saxifraga	.	.	.	.	.	.	30	.	6
Ranunculus montanus	.	.	25	9	.	.	.	.	.
Sedum rupestre	.	.	25	27	.	.	.	.	.
Sesleria cylindrica	.	.	.	.	.	.	.	100	44
Thalictrum minus	.	.	8	18	.	.	.	.	.
Thymus vulgaris	.	.	8	36	.	.	.	.	.
Trifolium pratense	.	.	42	9	.	.	.	.	.
Veronica officinalis	.	.	.	.	.	.	.	6	6
Vicia incana	.	.	.	.	.	.	.	56	13
Alliaria petiolata	.	.	.	.	.	.	.	6	6
Allium oleraceum	.	.	.	.	.	.	.	13	.
Asphodelus albus	.	.	.	.	.	17	.	.	.
Asplenium adiantum-nigrum	.	.	.	.	.	83	.	.	.
Blackstonia perfoliata	.	29	.	.	.	.	.	.	.
Calamintha nepeta	.	14	.	.	.	.	.	.	.
Campanula bononiensis	60	.	.	.	.	.	.	.	.
Carex montana	.	.	.	.	50	.	.	.	.
Carlina utzka	.	.	17	.	.	.	.	.	.
Carlina vulgaris	.	14	.	.	.	.	.	.	.
Centaurea montana	.	.	.	.	.	17	.	.	.
Coronilla minima	.	.	17	.	.	.	.	.	.
Epilobium montanum	.	.	.	.	.	.	10	.	.
Festuca duriuscula	.	14	.	.	.	.	.	.	.
Fragaria viridis	.	.	.	.	.	.	.	.	25
Helichrysum italicum	.	14	.	.	.	.	.	.	.
Hieracium glaucinum	.	14	.	.	.	.	.	.	.
Hypericum perforatum	.	14	.	.	.	.	.	.	.
Koeleria pyramidata	.	14	.	.	.	.	.	.	.
Laserpitium latifolium	.	.	.	.	.	.	.	9	.
Leopoldia comosa	.	14	.	.	.	.	.	.	.
Linum viscosum	.	14	.	.	.	.	.	.	.
Medicago lupulina	.	14	.	.	.	.	.	.	.
Molinia arundinacea	.	.	.	.	.	.	.	.	9
Peucedanum officinale	.	.	.	.	.	.	.	19	.
Phyteuma betonicifolium	.	.	.	.	.	17	.	.	.
Pimpinella major	.	.	.	.	.	.	20	.	.
Pinus pinaster	.	14	.	.	.	.	.	.	.
Prunella vulgaris	.	.	.	.	100	.	.	.	.
Psoralea bituminosa	.	43	.	.	.	.	.	.	.
Saponaria ocymoides	.	.	.	.	.	.	.	19	.
Saxifraga cuneifolia	.	.	25	.	.	.	.	.	.
Sedum maximum	.	14	.	.	.	.	.	.	.
Sesleria varia	40	.	.	.	.	.	.	.	.
Stachys recta	.	14	.	.	.	.	.	.	.
Teucrium lucidum	20	.	.	.	.	.	.	.	.
Teucrium montanum	.	.	.	18	.	.	.	.	.
Trifolium medium	.	.	.	.	.	.	.	31	.
Trifolium ochroleucum	.	.	.	.	.	.	.	.	6
Vicia cracca	.	.	.	.	.	.	.	.	9

Tab. 3 Lauro nobilis - Quercenion pubescentis

1 - Daphno laureolae-Ostryetum carpinifoliae
2 - Violo hirtae - Carpinetum orientalis
3 - Aceri obtusati-Ostryetum carpinifoliae
4 - Roso sempervirentis -Quercetum pubescentis carpinetosum orientalis
5 - Roso sempervirentis-Quercetum pubescentis ericetosum multiflorae
6 - Roso sempervirentis-Quercetum pubescentis
7 - Roso sempervirentis-Quercetum pubescentis ericetosum arboreae
8 - Cercido siliquastri-Quercetum pubescentis
9 - Asparago acutifolii-Ostryetum carpinifoliae
10 - Asparago acutifolii-Ostryetum cytisetosum sessilifolii
11 - Lonicero etruscae-Carpinetum orientalis
12 - Lonicero etruscae-Carpinetum orientalis phillyretosum latifoliae
13 - Festuco-Aceretum neapolitani
14 - Euphorbio apii- Quercetum trojanae
15 - Euphorbio apii- Quercetum trojanae poetosum sylvicolae
16 - Clematido flammulae-Quercetum pubescentis

c = characteristic; d = differential; t = transgressive

	N. column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	N. releves	17	6	6	15	10	4	8	2	12	15	16	19	15	6	9	8
	Lauro nobilis-Quercenion pubescentis																
c	Asparagus acutifolius	88	50	100	100	100	100	50	100	100	87	69	84	20	100	56	100
c	Cyclamen repandum	.	.	.	33	.	.	25	50	100	27	56	26	.	67	56	.
c	Viburnum tinus	12	.	.	33	80	.	.	.	33	.	6	21	40	.	33	.
c	Cercis siliquastrum	.	.	.	33	20	.	.	100	.	7	63	42	.	.	.	.
c	Laurus nobilis	24	.	.	13	.	25	.	50	50	.	.	.	7	.	.	.
c	Pistacia terebinthus	.	.	.	73	10	.	.	.	.	.	25	63	.	.	33	25
c	Anemone hortensis	.	.	.	20	.	.	.	.	8	.	44	21	.	.	78	.
c	Quercus trojana	.	.	.	.	.	.	.	.	.	.	.	.	.	100	100	.
d	Rubia peregrina	82	33	100	93	100	100	75	100	100	53	63	90	73	100	89	75
d	Rosa sempervirens	53	.	17	53	100	100	25	50	42	20	25	58	7	83	89	50
d	Phillyrea latifolia	.	.	.	27	30	.	.	.	.	.	13	95	7	100	56	25
d	Clematis flammula	.	.	.	20	60	75	.	.	25	.	.	21	33	.	.	100
d	Osyris alba	.	.	.	.	80	.	50	50	.	33	.	.	.	.	.	100
d	Dorycnium hirsutum	.	.	.	.	80	.	.	.	.	.	.	.	.	50	11	.
d	Dryopteris pallida	.	.	.	47	.	.	.	.	.	.	44	37	.	.	.	.
d	Pinus halepensis	.	.	.	.	70	.	.	.	.	7	.	.	.	.	.	.
	Laburno anagyroidis-Ostryenion carpinifoliae																
c	Lilium bulbiferum subsp. croceum	.	.	.	.	.	.	13	.	.	.	38	5	20	.	.	.
c	Helleborus bocconei subsp. bocconei	12	.	.	.	.	.	.	50	.	40	.	.	.	.	.	.
c	Laburnum anagyroides	24	.	.	.	.	.	.	.	.	.	19	.	.	.	.	.
c	Digitalis lutea	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
c	Sanicula europaea	.	.	.	.	.	.	.	.	50	.	.	.	.	.	.	.
d	Polypodium gr. vulgare	24	.	50	40	.	.	.	.	.	.	31	16	.	.	.	.
d	Doronicum columnae	.	.	.	.	.	.	.	.	.	.	25	.	.	.	.	.
d	Sesleria italica	.	.	.	.	.	.	.	.	.	.	.	.	13	.	.	.
t	Hepatica nobilis	.	.	.	.	.	.	25	50	33	20	.	.	.	.	.	25
t	Epipactis helleborine	6	.	.	.	.	.	.	.	25	60	.	.	.	.	.	25
t	Calamintha sylvatica	.	.	.	.	.	.	.	.	8	.	.	11	.	.	.	.
t	Bromus ramosus	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.
t	Lonicera xylosteum	.	.	.	.	.	.	.	.	.	47	.	.	.	.	.	.
	Cytiso sessilifolii-Quercenion pubescentis																
c	Cytisus sessilifolius	.	.	.	7	50	.	.	100	33	67	12	.	27	.	.	38
c	Peucedanum cervaria	6	.	.	.	.	.	.	50	.	20	.	.	.	.	.	75
c	Juniperus oxycedrus	.	.	.	.	90	.	38	.	.	13	.	.	.	.	.	.
c	Chamaecytisus hirsutus	.	.	.	.	.	.	50	.	.	.	.	.	.	.	.	75
c	Inula salicina	.	.	.	.	.	.	.	.	.	13	.	.	.	.	.	38
d	Inula conyza	.	.	.	7	80	50	.	.	.	20	.	.	.	.	.	25
d	Spartium junceum	.	.	67	33	70	.	.	.	.	.	.	.	.	.	.	25
d	Carex hallerana	.	.	.	.	.	.	.	.	.	.	.	.	.	50	.	.
	Carpinion orientalis																
c	Coronilla emerus subsp. emeroides	.	17	.	13	50	100	75	50	100	60	63	11	67	.	.	63
c	Ostrya carpinifolia	100	.	100	7	60	.	63	50	100	47	94	47	93	.	.	25
c	Acer obtusatum	.	.	100	.	20	.	.	.	8	13	19	.	53	.	.	.
c	Carpinus orientalis	.	100	.	80	.	.	88	.	.	.	100	100	7	.	.	.
c	Colutea arborescens	.	.	.	.	.	.	.	100	.	47	6	.	7	.	.	.
c	Sesleria autumnalis	.	.	.	13	40	.	.	.	.	.	100	79	.	.	.	.
c	Cnidium silaifolium	.	.	.	.	40	.	.	100	.	13	.	.	.	.	.	.
c	Campanula persicifolia	.	.	.	.	.	.	.	.	.	.	.	.	7	.	.	.
c	Peucedanum verticillare	.	.	.	.	.	.	.	.	.	40	.	.	.	.	.	.
d	Orchis purpurea	12	.	.	.	.	.	.	.	33	13	.	.	.	.	.	38
d	Cotinus coggygria	.	.	.	.	.	.	.	100	.	47	.	.	.	.	.	.
d	Silene italica subsp. nemoralis	.	.	.	.	.	.	.	.	.	.	19	11	.	.	.	.
t	Melittis melissophyllum	65	.	.	.	.	.	63	100	58	27	94	5	7	.	.	75
t	Acer monspessulanum	6	.	.	20	60	.	.	.	.	7	88	90	.	.	.	25
t	Arabis turrita	.	.	.	.	30	.	.	.	.	.	19	.	7	.	.	.
t	Viola hirta	.	50	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Teucrio siculi-Quercion cerridis																
	Crepis leontodontoides	.	.	100	.	.	.	.	.	.	.	.	.	7	67	56	.
	Teucrium siculum	.	.	100	7	.	.	.	.	.	.	38	21	.	.	.	.

Erica arborea	.	.	.	.	.	.	50	.	.	.	.	.	33	.	.	38
Cytisus villosus	.	.	100	.	.	.	.	.	.	.	.	.	27	.	.	.
Ptilostemon strictus	.	.	.	.	.	.	.	.	.	13	.	.	7	.	.	.
Digitalis micrantha	.	.	.	.	.	.	.	.	.	27	.	.	.	.	.	.
Silene viridiflora	.	.	83	.	.	.	.	.	.	.	.	.	.	.	.	.
Erythronio-Quercion petraeae																
Helleborus viridis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	50
Pino-Quercion congestae																
Pinus nigra subsp. calabrica	.	.	83	.	.	.	.	.	.	.	.	.	.	.	.	.
Quercus congesta	.	.	100	.	.	.	.	.	.	.	.	.	.	.	.	.
Rubus aetnicus	.	.	100	.	.	.	.	.	.	.	.	.	.	.	.	.
Thalictrum calabricum	.	.	67	.	.	.	.	.	.	.	.	.	.	.	.	.
Quercion pubescenti-petraeae																
Primula veris	.	.	.	.	.	.	.	.	.	13	.	.	7	.	.	.
Quercetalia pubescenti-petraeae																
Buglossoides purpurocaerulea	18	17	.	87	90	75	13	100	100	33	25	26	13	50	78	38
Fraxinus ornus	100	83	100	87	100	75	100	100	100	93	100	90	80	.	44	100
Viola alba subsp. dehnhardtii	88	.	.	73	100	75	50	50	100	100	94	84	40	67	56	75
Lonicera etrusca	94	.	100	87	100	50	75	100	.	73	69	42	.	50	89	100
Quercus pubescens	82	.	100	100	100	100	100	100	100	100	69	63	40	.	.	100
Brachypodium rupestre	88	67	.	80	100	25	.	50	.	100	100	53	.	.	.	100
Sorbus domestica	53	.	.	20	80	75	38	100	42	.	19	16	.	.	.	.
Stachys officinalis	18	.	.	7	.	.	25	50	75	40	31	16	.	.	.	38
Quercus cerris	59	.	.	60	.	75	100	.	.	13	50	5	.	.	22	.
Cornus mas	12	.	.	.	.	.	.	50	.	20	50	32	.	.	.	38
Oenanthe pimpinelloides	.	.	.	47	.	.	.	.	8	.	31	32	33	.	.	.
Scutellaria columnae	.	.	.	7	.	.	13	.	.	.	19	11	27	.	.	.
Silene italica subsp. italica	.	.	.	20	.	.	.	50	.	27	.	.	.	100	67	.
Arum italicum	.	.	.	7	.	.	.	.	.	.	13	16	13	.	.	.
Helleborus foetidus	12	.	.	.	20	.	.	.	.	.	.	.	7	.	.	.
Serratula tinctoria	.	.	.	.	.	.	13	.	8	.	.	.	.	.	.	50
Pulicaria odora	.	.	.	.	.	.	.	.	.	.	.	21	.	50	.	.
Ranunculus neapolitanus	.	.	.	.	.	.	.	.	.	.	.	.	.	83	100	.
Sorbus torminalis	.	.	.	.	70	.	25	.	.	.	.	.	.	.	.	.
Agrimonia eupatoria	.	.	.	20	.	.	.	.	.	.	.	.	.	.	.	.
Limodorum abortivum	.	.	.	.	30	.	.	.	.	.	.	.	.	.	.	.
Fagetalia sylvaticae																
Acer pseudoplatanus	6	.	50	.	.	.	.	.	.	.	.	.	7	.	.	.
Ornithogalum pyrenaicum	.	.	.	.	.	.	.	.	25	.	6	5	.	.	.	.
Cephalanthera rubra	24	.	.	.	20	.	.	.	.	.	.	.	.	.	.	.
Anemone trifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13
Dactylorhiza maculata	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Arum apulum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11	.
Cardamine chelidonia	.	.	.	.	.	.	.	.	.	.	.	.	7	.	.	.
Galium odoratum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	56	.
Lathyrus vernus	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Monotropa hypopitys	12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Poa nemoralis	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.
Salvia glutinosa	.	.	.	.	.	.	.	.	.	.	.	.	7	.	.	.
Alnus cordata	.	.	.	.	.	.	.	.	.	.	.	.	13	.	.	.
Populetalia albae																
Populus tremula	.	.	.	.	.	.	.	.	.	.	.	.	7	.	.	.
Rubus caesius	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Querco-Fagetea																
Hedera helix	100	83	33	93	70	100	38	100	100	93	56	84	87	50	78	50
Ruscus aculeatus	76	100	100	.	10	100	38	50	67	47	75	84	80	.	78	100
Tamus communis	88	.	50	87	90	.	13	50	17	67	44	68	60	.	67	100
Brachypodium sylvaticum	53	67	100	27	.	.	38	.	100	.	13	26	33	.	78	.
Clematis vitalba	29	17	.	40	50	.	.	50	42	47	13	32	13	.	.	.
Acer campestre	12	.	.	87	70	.	25	.	8	47	19	37	.	.	.	25
Ajuga reptans	6	17	.	7	.	.	13	.	58	.	38	5	13	.	.	.
Cephalanthera longifolia	6	33	.	.	.	.	13	50	75	27	.	.	7	.	.	13
Cruciata glabra	76	.	.	.	20	.	50	50	.	60	19	11	.	.	.	38
Lonicera caprifolium	.	17	.	7	20	.	88	.	75	20	.	.	13	.	.	.
Luzula forsteri	.	.	50	.	.	.	.	.	42	.	13	5	13	67	11	.
Cyclamen hederifolium	.	.	83	.	.	.	.	.	.	.	31	5	27	.	.	38
Festuca heterophylla	41	.	.	.	.	.	13	.	.	.	19	21	20	.	.	.
Lathyrus venetus	.	.	.	20	.	.	.	.	8	.	50	16	53	.	.	.
Prunus avium	24	.	.	13	40	.	.	.	50	73	.	.	.	.	.	.
Poa sylvicola	.	.	100	20	.	.	.	.	.	.	.	.	7	.	100	.
Daphne laureola	100	.	.	.	.	.	13	.	67	.	.	.	7	.	.	.
Fragaria vesca	12	.	.	.	.	.	25	.	17	.	25	.	.	.	.	.
Melica uniflora	.	.	.	20	.	.	.	.	.	.	6	11	7	.	.	.
Rubus hirtus	.	.	.	53	.	.	.	.	.	.	63	16	7	.	.	.
Solidago virgaurea	.	.	.	.	.	.	.	50	33	67	.	.	13	.	.	.
Ulmus minor	6	.	.	60	.	.	.	.	.	.	19	11	.	.	.	.
Viola riviniana+reichenbachiana	35	.	.	.	.	.	38	.	67	.	.	.	13	.	.	.
Anemone apennina	.	.	.	.	.	.	.	.	.	.	31	5	7	.	.	.
Castanea sativa	.	.	50	13	.	.	.	.	.	.	.	.	53	.	.	.
Lathyrus sylvestris	.	.	.	20	40	.	.	.	.	.	.	.	.	.	.	25
Primula vulgaris	12	.	.	.	.	.	13	.	50	.	.	.	.	.	.	.
Malus sylvestris	6	.	.	.	.	.	.	.	.	20	.	.	.	.	.	.
Campanula trachelium	.	.	.	.	.	.	.	.	42	.	.	.	13	.	.	.
Cephalanthera damasonium	.	.	.	.	.	.	.	50	.	27	.	.	.	.	.	.
Chaerophyllum temulentum	6	.	33	.	.	.	.	.	.	.	.	.	.	.	.	.
Corylus avellana	.	.	.	.	.	.	13	.	.	.	.	.	7	.	.	.
Festuca exaltata	.	.	100	.	.	.	.	.	.	.	.	.	100	.	.	.
Geum urbanum	.	.	.	20	.	.	.	.	.	.	.	.	.	.	78	.
Hieracium gr. murorum	6	.	.	.	.	.	.	.	33	.	.	.	.	.	.	.

Hieracium lachenalii	.	.	.	.	.	.	.	.	.	.	19	11	.	.	.	.
Rosa arvensis	.	.	.	.	.	.	.	.	.	.	38	11	.	.	.	.
Silene latifolia	.	.	17	.	.	.	.	.	.	.	.	.	.	.	67	.
Genista tinctoria	.	.	.	.	.	.	.	.	.	13	.	.	.	.	.	.
Luzula sylvatica	.	.	.	.	.	.	.	.	8	.	.	.	.	.	.	.
Quercus petraea	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Anthriscus sylvestris	.	.	.	.	.	.	.	.	.	.	.	.	7	.	.	.
Aremonia agrimonoides	.	.	.	.	.	.	.	.	.	.	19	.	.	.	.	.
Carpinus betulus	.	33	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dryopteris filix-mas	.	.	.	.	.	.	.	.	.	.	31	.	.	.	.	.
Euphorbia amygdaloides	.	.	.	.	.	.	50	.	.	.	.	.	.	.	.	.
Hieracium sabaudum	.	.	.	.	.	.	.	.	.	20	.	.	.	.	.	.
Mycelis muralis	.	.	.	.	.	.	.	.	.	.	.	.	27	.	.	.
Neottia nidus-avis	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Platanthera bifolia	18	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Polystichum setiferum	.	.	.	.	.	.	.	.	.	.	.	.	13	.	.	.
Potentilla micrantha	.	.	.	.	.	.	.	.	.	.	13	.	.	.	.	.
Quercus robur	.	83	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ranunculus nemorosus	.	.	.	.	.	.	.	.	.	20	.	.	.	.	.	.
Silene nutans	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	38
Symphytum tuberosum	.	.	.	.	.	.	.	.	17	.	.	.	.	.	.	.
Thalictrum aquilegifolium	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rhamno-Prunetea																
Crataegus monogyna	76	100	100	93	20	100	25	100	100	87	75	79	7	83	100	63
Rubus ulmifolius	53	100	.	67	40	.	63	.	.	73	31	21	27	100	33	38
Euonymus europaeus	29	17	.	33	.	.	13	.	42	27	6	11	33	.	89	25
Cornus sanguinea	59	67	.	87	100	50	50	100	75	93	.	.	.	.	.	50
Prunus spinosa	82	.	.	67	40	.	.	100	25	80	6	11	.	.	78	38
Ligustrum vulgare	41	83	.	93	90	.	50	.	.	.	6	11	.	.	.	25
Juniperus communis	82	33	.	.	60	.	13	50	17	67	.	.	.	.	.	38
Rosa canina	35	.	50	.	90	.	.	100	.	27	19	11	.	.	.	.
Euphorbia characias	.	.	100	7	.	.	.	.	.	.	6	11	.	.	.	.
Pyracantha coccinea	.	.	.	.	80	.	50	.	.	33	.	.	.	.	.	.
Pyrus amygdaliformis	.	.	17	.	.	.	.	.	.	.	.	.	.	83	89	.
Pyrus pyraster	6	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.
Rubus canescens	.	.	.	13	.	.	.	.	.	.	13	.	.	.	.	.
Rubus gr. silvatici	.	.	.	.	.	.	.	.	.	.	13	37	.	.	.	.
Crataegus laevigata	24	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Berberis vulgaris	.	17	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Coronilla emerus	94	.	.	.	.	.	.	,	,	.	.	.	,	.	.	,
Prunus mahaleb	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.
Rosa agrestis	.	.	.	.	.	.	.	.	.	.	19	.	.	.	.	.
Rosa gallica	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Viburnum lantana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25
Quercetea ilicis																
Quercus ilex	18	100	100	13	.	.	75	100	50	13	44	79	87	100	33	38
Smilax aspera	.	.	50	93	40	75	50	50	67	.	13	90	60	.	.	.
Rhamnus alaternus	.	.	67	.	.	50	.	50	8	.	.	.	20	.	.	.
Ampelodesmos mauritanicus	.	.	.	27	.	.	13	.	25	.	6	53	.	.	.	.
Asplenium onopteris	.	.	100	40	.	.	.	.	.	.	81	90	47	.	.	.
Pistacia lentiscus	.	.	.	13	.	.	.	.	.	.	.	42	7	.	33	.
Carex distachya	.	.	100	.	.	.	.	.	.	.	.	.	20	83	89	.
Lonicera implexa	.	.	.	.	30	50	.	.	.	.	.	.	33	.	56	.
Myrtus communis	.	.	.	7	.	.	.	.	.	.	.	26	20	.	.	.
Arbutus unedo	.	.	.	.	100	.	.	.	.	.	.	.	13	.	.	.
Calicotome infesta	.	.	.	.	.	.	.	.	.	.	.	.	.	83	33	.
Allium subhirsutum	.	.	.	.	.	.	.	.	.	.	.	.	.	100	56	.
Arisarum vulgare	.	.	.	.	.	.	.	.	.	.	.	.	13	.	.	.
Carex divulsa	.	.	.	13	.	.	.	.	.	.	.	.	.	.	.	.
Other species																
Carex flacca	29	50	.	33	100	100	38	50	100	93	6	21	.	.	.	88
Teucrium chamaedrys	18	.	33	13	80	50	50	100	.	40	.	11	.	67	44	50
Dactylis glomerata	24	.	33	13	40	.	.	.	25	13	6	5	.	67	100	38
Pteridium aquilinum	24	33	100	.	.	.	25	.	75	53	.	.	40	.	.	.
Clinopodium vulgare	24	.	83	.	30	.	.	.	.	13	.	.	7	.	.	50
Asplenium trichomanes	6	.	67	47	.	.	.	.	.	.	81	47	.	.	.	.
Geranium purpureum	6	.	50	27	.	.	.	.	.	.	25	21	.	.	.	.
Galium lucidum	6	.	.	13	.	.	.	.	.	.	6	5	.	.	.	.
Leopoldia comosa	.	.	17	40	.	.	.	.	.	.	6	5	.	.	.	.
Asphodelus microcarpus	.	.	17	13	.	.	.	.	.	.	.	.	.	.	67	.
Ceterach officinarum	.	.	.	60	.	.	.	.	.	.	19	21	.	.	.	.
Cistus creticus susbsp. eriocephalus	.	.	.	.	60	.	.	.	.	.	.	.	.	50	22	.
Geranium sanguineum	.	.	.	.	.	.	.	.	.	.	.	.	.	83	89	50
Prunella vulgaris	29	.	.	.	.	.	.	.	17	.	13	.	.	.	.	.
Ranunculus bulbosus	12	.	.	13	.	.	.	.	.	.	13	.	.	.	.	.
Tanacetum corymbosum	29	.	.	.	.	.	.	.	.	.	13	.	.	.	.	88
Anthoxanthum odoratum	.	.	.	.	.	.	.	.	.	.	.	.	.	50	56	.
Brachypodium ramosum	.	.	.	33	.	.	.	.	.	.	.	.	27	.	.	.
Bromus erectus	.	.	.	.	40	.	.	.	.	.	.	.	.	.	.	38
Carex flacca subsp. serrulata	.	.	.	.	.	.	.	.	.	.	.	.	.	83	56	.
Cistus monspeliensis	.	.	.	.	.	.	.	.	.	.	.	.	.	83	11	.
Cruciata laevipes	.	.	.	7	.	.	.	.	.	.	13	.	.	.	.	.
Euphorbia apios	.	.	.	.	.	.	.	.	.	.	.	.	.	100	100	.
Euphorbia cyparissias	.	17	.	.	.	.	.	.	.	13	.	.	.	.	.	.
Festuca rubra	.	.	.	.	.	.	.	.	.	.	.	.	.	50	33	.
Galium verum subsp. verum	.	.	.	.	.	.	.	.	.	.	.	.	.	33	22	.
Lathyrus latifolius	6	.	.	.	.	.	.	.	.	20	.	.	.	.	.	.
Pimpinella saxifraga	.	.	.	.	.	.	.	100	.	13	.	.	.	.	.	.
Plantago lanceolata	.	.	.	.	.	.	.	.	.	.	6	5	.	.	.	.
Potentilla detommasii	.	.	.	.	.	.	.	.	.	.	.	.	.	50	89	.
Sanguisorba minor	.	.	.	.	.	.	.	.	.	.	.	.	.	17	56	.
Selaginella denticulata	.	.	.	.	.	.	.	.	.	.	13	32	.	.	.	.

Silene vulgaris	.	.	50	.	.	.	.	.	.	.	.	.	.	.	44	.
Stachys salvifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	83	67	.
Teucrium flavum	.	.	.	.	.	.	.	.	8	.	.	.	7	.	.	.
Trifolium medium	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13
Viola suavis	.	.	.	.	.	.	.	.	.	.	6	16	.	.	.	.
Achillea ligustica	.	.	83	.	.	.	.	.	.	.	.	.	.	.	.	.
Arabis hirsuta	.	.	.	.	.	.	.	.	.	.	.	.	.	.	89	.
Arabis sagittata	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Asperula laevigata	.	.	.	.	.	.	.	.	.	.	19	.	.	.	.	.
Astragalus glycyphyllos	.	.	.	.	.	.	.	.	.	.	.	.	13	.	.	.
Bellis perennis	.	.	67	.	.	.	.	.	.	.	.	.	.	.	.	.
Biarum tenuifolium	.	.	.	13	.	.	.	.	.	.	.	.	.	.	.	.
Brassica incana	.	.	.	.	.	.	.	.	.	.	.	.	13	.	.	.
Calamintha nepeta	.	33	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Carlina corymbosa	.	.	83	.	.	.	.	.	.	.	.	.	.	.	.	.
Centaurea nigrescens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	38
Centaurea triumfetti	.	.	.	.	.	.	38	.	.	.	.	.	.	.	.	.
Chaerophyllum aureum	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.
Cotoneaster nebrodensis	.	.	.	.	.	.	13	.	.	.	.	.	.	.	.	.
Crepis vesicaria	.	.	.	.	.	.	.	.	.	.	.	.	.	.	89	.
Cynosurus elegans	.	.	33	.	.	.	.	.	.	.	.	.	.	.	.	.
Daucus carota	.	.	50	.	.	.	.	.	.	.	.	.	.	.	.	.
Erica multiflora	.	.	.	.	70	.	.	.	.	.	.	.	.	.	.	.
Ferulago campestris	.	.	.	.	.	.	.	100	.	.	.	.	.	.	.	.
Ficus carica	.	.	.	27	.	.	.	.	.	.	.	.	.	.	.	.
Galium album	.	.	.	13	.	.	.	.	.	.	.	.	.	.	.	.
Hypericum perforatum	.	.	83	.	.	.	.	.	.	.	.	.	.	.	.	.
Knautia arvensis	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lamium garganicum subsp. laevigatum	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.
Leontodon tuberosus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	44	.
Lolium perenne	.	.	17	.	.	.	.	.	.	.	.	.	.	.	.	.
Lolium rigidum	.	.	67	.	.	.	.	.	.	.	.	.	.	.	.	.
Micromeria graeca	.	.	33	.	.	.	.	.	.	.	.	.	.	.	.	.
Molinia arundinacea	.	33	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Origanum vulgare	.	.	67	.	.	.	.	.	.	.	.	.	.	.	.	.
Ornithogalum brevistylum	.	.	.	13	.	.	.	.	.	.	.	.	.	.	.	.
Orobanche hederae	.	.	.	.	.	.	.	.	8	.	.	.	.	.	.	.
Pinus nigra	.	.	.	.	.	.	.	.	.	.	.	.	13	.	.	.
Rumex acetosa	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.
Sesleria nitida	.	.	.	.	.	.	50	.	.	.	.	.	.	.	.	.
Silene dioica	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.
Stachys recta	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25
Torilis japonica	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trifolium ochroleucum	.	.	83	.	.	.	.	.	.	.	.	.	.	.	.	.
Umbilicus horizontalis	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.
Vicia cracca	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25
Vicia ochroleuca	.	.	.	.	.	.	.	.	.	.	.	.	40	.	.	.
Vinca major	.	.	.	.	.	.	.	.	.	.	.	.	7	.	.	.
Vitis vinifera	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.

Tab. 4 - Cytiso sessilifolii - Quercenion pubescentis

1 - Cytiso sessilifolii-Quercetum pubescentis
2 - Lembotropi-Quercetum cerridis
3 - Cytiso sessilifolii -Quercetum pubescentis buxetosum sempervirentis
4 - Peucedano cervariae-Quercetum pubescentis
5 - Peucedano cervariae-Quercetum pubescentis astragaletosum monspessulani
6 - Knautio purpureae-Quercetum pubescentis
7 - Knautio purpureae-Quercetum pubescentis cephalantheretosum
8 - Knautio purpureae-Quercetum pubescentis stachydetosum

c = characteristic; d = differential; t = transgressive

	N. column	1	2	3	4	5	6	7	8
	N. releves	12	6	5	24	14	12	19	17
	Cytiso sessilifolii-Quercenion pubescentis								
c	Cytisus sessilifolius	100	50	100	92	100	75	89	47
c	Inula salicina	.	50	.	42	71	50	.	18
c	Melampyrum cristatum	.	.	.	13	21	17	21	12
c	Chamaecytisus hirsutus	.	100	.	.	.	42	5	65
c	Juniperus oxycedrus	58	.	100	29	50	.	.	.
c	Peucedanum cervaria	.	.	.	63	50	.	47	29
c	Chamaecytisus spinescens	42	.	40	.	.	.	.	.
d	Carex hallerana	.	33	.	42	36	42	37	18
d	Inula conyza	.	50	.	46	43	50	11	.
d	Spartium junceum	25	.	.	33	50	17	.	.
d	Helianthemum nummularium subsp. obscurum	33	.	.	.	50	17	.	.
d	Knautia purpurea	.	.	.	.	.	75	42	35
d	Polygala nicaeensis	.	.	.	.	.	17	.	.
	Laburno anagyroidis-Ostryenion carpinifoliae								
c	Laburnum anagyroides	17	.	20	.	.	42	.	.
c	Digitalis lutea	.	33	.	.	.	.	.	.
c	Helleborus bocconei subsp. bocconei	.	.	.	58	.	.	.	.
d	Sesleria italica	33	.	.	21	21	.	.	.
t	Epipactis helleborine	17	.	.	71	50	67	47	.
t	Lonicera xylosteum	.	.	.	38	29	17	37	65
t	Hepatica nobilis	8	.	.	21	.	.	5	24
	Campanulo mediae-Ostryenion carpinifoliae								
d	Lathyrus pratensis	.	.	.	29	.	.	.	.
t	Acer opulifolium	.	.	.	.	.	33	68	.
	Lauro nobilis-Quercenion pubescentis								
c	Asparagus acutifolius	25	.	20	.	29	.	.	.
c	Cercis siliquastrum	.	.	.	.	.	8	.	.
c	Cyclamen repandum	17	.	.	.	.	.	.	.
c	Pistacia terebinthus	.	.	40	.	.	.	.	.
d	Dorycnium hirsutum	.	.	.	38	86	33	.	.
d	Osyris alba	.	.	40	17	36	.	.	.
d	Rubia peregrina	8	.	.	.	.	.	.	.
	Carpinion orientalis								
c	Ostrya carpinifolia	58	33	40	50	79	58	68	24
c	Acer obtusatum	17	.	.	8	21	.	.	.
c	Colutea arborescens	.	33	.	42	.	17	.	.
c	Carpinus orientalis	8	.	60	.	.	.	.	.
c	Cnidium silaifolium	.	.	.	.	.	33	16	.
c	Coronilla emerus subsp. emeroides	.	.	40	.	.	.	.	.
d	Orchis purpurea	.	.	.	38	21	25	26	.
d	Silene italica subsp. nemoralis	.	.	20	.	.	58	.	.
t	Melittis melissophyllum	25	.	.	.	21	17	37	24
t	Acer monspessulanum	8	.	20	.	.	42	.	.
t	Arabis turrita	.	.	20	.	.	17	.	.
t	Viola hirta	8	.	.	.	.	.	.	.
	Teucrio siculi-Quercion cerridis								
	Crepis leontodontoides	.	.	.	17	.	.	16	.
	Digitalis micrantha	25	.	.	17	.	.	.	.
	Erica arborea	.	83	.	.	.	.	.	.
	Malus florentina	.	.	.	.	.	.	.	35
	Erytronio-Quercion petraeae								
	Physospermum cornubiense	.	50	.	.	.	.	11	18
	Helleborus viridis	.	.	.	.	.	33	.	53
	Quercion pubescenti-petraeae								
	Buxus sempervirens	.	.	100	.	.	.	.	.
	Quercetalia pubescenti-petraerae								
	Brachypodium rupestre	42	100	40	100	100	100	100	100
	Fraxinus ornus	75	83	80	96	86	92	84	76
	Quercus pubescens	100	100	100	100	100	100	100	100
	Cornus mas	17	50	20	25	.	25	21	47
	Sorbus domestica	.	33	40	79	43	75	53	76
	Viola alba subsp. dehnhardtii	.	83	20	88	86	100	89	88
	Quercus cerris	33	100	.	46	21	.	68	94
	Stachys officinalis	.	100	.	75	64	.	5	82
	Buglossoides purpurocaerulea	.	.	.	25	.	50	37	6
	Lonicera etrusca	17	.	80	96	93	.	.	.
	Sorbus torminalis	.	100	.	.	.	58	21	35
	Serratula tinctoria	.	.	.	8	.	.	26	24
	Hypericum montanum	.	50	.	.	.	25	.	.
	Lathyrus niger	.	83	.	4	.	.	.	.
	Asparagus tenuifolius	.	.	.	.	.	17	.	18
	Sorbus aria	8	.	20	.	.	.	.	.
	Iris graminea	.	.	.	.	.	.	26	.
	Agrimonia eupatoria	25	.	.	.	.	.	.	.
	Helleborus foetidus	.	.	.	.	.	17	.	.
	Fagetalia sylvaticae								
	Cephalanthera rubra	.	.	.	.	.	.	11	6
	Euphorbia dulcis	.	.	.	.	.	.	.	24
	Geranium robertianum	.	.	20	.	.	.	.	.
	Poa nemoralis	17	.	.	.	.	.	.	.
	Quercetalia robori-petraeae								
	Erythronium dens canis	.	.	.	.	.	.	.	12
	Querco-Fagetea								
	Cruciata glabra	42	50	.	75	71	25	26	71
	Lonicera caprifolium	33	50	.	83	36	50	79	94
	Prunus avium	.	33	20	58	43	42	74	41
	Tamus communis	8	50	20	71	.	83	63	18
	Clematis vitalba	8	33	.	38	.	58	16	18
	Hedera helix	8	50	.	50	.	33	21	12
	Lathyrus sylvestris	8	.	.	67	21	50	42	6
	Acer campestre	.	50	.	25	.	83	68	76
	Rosa arvensis	.	50	.	21	.	42	5	53
	Daphne laureola	8	.	.	.	.	50	5	18
	Hieracium sylvaticum	.	.	40	.	21	.	47	35
	Ruscus aculeatus	.	.	40	8	21	17	.	.
	Platanthera clorantha	.	33	.	.	.	.	16	18
	Castanea sativa	.	33	.	.	.	17	.	12
	Cephalanthera damasonium	.	.	.	21	.	17	42	.
	Cephalanthera longifolia	.	.	.	25	50	.	42	.
	Corylus avellana	8	33	.	.	.	33	.	.
	Cyclamen hederifolium	8	.	.	.	.	8	.	41
	Fragaria vesca	8	67	.	.	.	.	.	71
	Hieracium sabaudum	.	83	.	.	.	42	.	29
	Solidago virgaurea	.	83	.	17	29	.	.	.
	Viola riviniana+reichenbachiana	33	50	.	.	.	.	.	29
	Genista tinctoria	.	.	.	58	71	.	.	.
	Listera ovata	.	.	.	.	.	.	11	12
	Ajuga reptans	.	.	.	.	.	.	5	41
	Brachypodium sylvaticum	25	.	40	.	.	.	.	.
	Carpinus betulus	8	.	.	.	.	.	.	12
	Luzula forsteri	.	50	.	.	.	.	.	18
	Potentilla micrantha	.	50	.	.	.	.	.	41
	Ranunculus nemorosus	.	.	.	58	21	.	.	.
	Silene nutans	.	50	.	46	.	.	.	.
	Symphytum tuberosum	.	.	.	.	.	.	11	18
	Anemone apennina	8	.	.	.	.	.	.	.
	Euphorbia amygdaloides	8	.	.	.	.	.	.	.
	Festuca heterophylla	.	50	.	.	.	.	.	.
	Hieracium gr. murorum	8	.	.	.	.	.	.	.
	Lathyrus venetus	8	.	.	.	.	.	.	.
	Primula vulgaris	.	.	.	.	.	.	.	24
	Pulmonaria apennina	.	.	.	.	.	.	.	12
	Ulmus minor	.	.	.	.	.	.	.	12
	Rhamno-Prunetea								
	Rosa canina	75	33	20	71	21	33	26	59
	Cornus sanguinea	33	67	.	75	50	92	89	59
	Crataegus monogyna	42	83	.	88	36	92	84	94
	Juniperus communis	17	50	.	96	100	83	84	100
	Coronilla emerus	8	.	.	38	21	83	16	24
	Prunus spinosa	50	67	.	71	29	.	16	94
	Rubus ulmifolius	33	67	.	75	.	42	26	65
	Pyracantha coccinea	.	33	.	13	50	33	21	18
	Ligustrum vulgare	.	.	.	50	.	42	47	94
	Viburnum lantana	.	83	.	.	.	92	95	41
	Pyrus pyraster	.	33	.	.	.	.	37	100
	Euonymus europaeus	.	.	.	33	.	33	.	.
	Rosa agrestis	.	.	.	.	.	.	16	12
	Quercetea ilicis								
	Quercus ilex	25	.	.	.	.	.	.	.
	Other species								
	Carex flacca	33	33	40	92	86	92	95	88

Teucrium chamaedrys	58	83	40	100	93	83	79	65
Bromus erectus	17	.	.	63	86	33	37	35
Dactylis glomerata	67	.	.	50	64	33	16	53
Clinopodium vulgare	.	33	.	33	.	25	11	41
Trifolium medium	.	33	.	29	36	.	26	12
Centaurea nigrescens	.	.	.	29	36	.	11	35
Astragalus monspessulanus	.	.	.	21	86	.	11	24
Dianthus balbisii	.	.	.	29	36	17	.	29
Pteridium aquilinum	.	.	.	25	50	.	53	6
Asperula purpurea	25	.	.	25	79	.	.	.
Carlina vulgaris	17	.	.	25	57	.	.	.
Dorycnium pentaphyllum	17	.	.	38	50	.	.	.
Galium lucidum	33	.	.	.	.	58	.	29
Linum viscosum	.	.	.	29	57	.	16	.
Lotus corniculatus	83	.	.	17	29	.	.	.
Ranunculus bulbosus	25	33	.	.	.	42	.	.
Silene vulgaris	8	.	.	.	21	17	.	.
Tanacetum corymbosum	.	.	.	.	.	17	21	18
Vincetoxicum hirundinaria	.	.	.	.	.	17	37	.
Pinus sylvestris	.	.	.	.	.	.	26	6
Anthericum liliago	.	50	.	.	.	.	37	.
Eryngium amethystinum	33	.	.	.	21	.	.	.
Festuca gr. ovina	25	.	.	.	.	25	.	.
Geranium sanguineum	.	.	.	.	.	25	21	.
Hippocrepis comosa	33	.	.	.	21	.	.	.
Leucanthemum vulgare	.	.	.	33	57	.	.	.
Scabiosa columbaria	.	.	.	29	71	.	.	.
Trifolium rubens	.	50	.	.	.	17	.	.
Achillea nobilis	.	50	.	.	.	.	.	.
Acinos alpinus	.	.	.	.	.	17	.	.
Arabis collina	25	.	.	.	.	.	.	.
Arabis hirsuta	17	.	.	.	.	.	.	.
Asplenium trichomanes	8	.	.	.	.	.	.	.
Briza media	.	.	.	.	21	.	.	.
Calamagrostis varia	.	.	.	.	.	.	21	.
Calamintha nepeta	8	.	.	.	.	.	.	.
Carlina corymbosa	.	.	.	.	36	.	.	.
Centaurea nemoralis	.	50	.	.	.	.	.	.
Cerastium arvense	42	.	.	.	.	.	.	.
Ceterach officinarum	17	.	.	.	.	.	.	.
Coronilla varia	33	.	.	.	.	.	.	.
Cruciata laevipes	17	.	.	.	.	.	.	.
Euphorbia cyparissias	.	.	.	.	21	.	.	.
Euphorbia flavicoma	.	.	.	.	.	.	16	.
Ferulago campestris	.	.	.	.	.	17	.	.
Galium mollugo	17	.	.	.	.	.	.	.
Helianthemum apenninum	17	.	.	.	.	.	.	.
Hieracium glaucinum	.	.	.	.	.	33	.	.
Hypericum perforatum	33	.	.	.	.	.	.	.
Inula hirta	.	.	.	.	.	25	.	.
Juglans regia	.	.	.	.	.	.	42	.
Lathyrus latifolius	.	50	.	.	.	.	.	.
Lembotropis nigricans	.	50	.	.	.	.	.	.
Leontodon crispus	33	.	.	.	.	.	.	.
Molinia coerulea	.	.	.	.	.	.	21	.
Odontites lutea	17	.	.	.	.	.	.	.
Orchis simia	.	.	.	.	.	.	37	.
Paeonia officinalis	.	.	.	.	.	.	21	.
Phleum hirsutum	50	.	.	.	.	.	.	.
Pimpinella saxifraga	.	.	.	.	.	.	26	.
Prunella vulgaris	8	.	.	.	.	.	.	.
Sanguisorba minor	50	.	.	.	.	.	.	.
Saxifraga granulata	25	.	.	.	.	.	.	.
Sedum sediforme	42	.	.	.	.	.	.	.
Sesleria apennina	8	.	.	.	.	.	.	.
Sesleria nitida	.	.	60	.	.	.	.	.
Sesleria varia	.	.	.	.	.	.	21	.
Stachys recta	.	.	.	.	.	17	.	.
Vicia cassubica	.	50	.	.	.	.	.	.
Vicia cracca	.	.	.	29	.	.	.	.

Tab. 5 - Teucrio siculi - Quercenion cerridis

1 - Melico uniflorae-Quercetum cerridis
2 - Asplenio onopteris-Quercetum cerridis
3 - Cephalanthero longifoliae-Quercetum cerridis
4 - Arbuto unedonis Castanetum sativae
5 - Fraxino oxycarpae-Quercetum cerridis
6 - Asparago tenuifolii-Quercetum cerridis
7 - Asparago tenuifolii-Quercetum cerridis lathyretosum nigri
8 - Erico arboreae-Quercetum cerridis
9 - Malo florentinae-Quercetum frainetto
10 - Malo florentinae-Quercetum frainetto viburnetosum tini
11 - Pulicario odorae-Quercetum frainetto
12 - Quercetum frainetto-suberis
13 - Mespilo germanicae-Quercetum frainetto quercetosum roboris
14 - Mespilo germanicae-Quercetum frainetto
15 - Lonicero xylostei -Quercetum cerridis
16 - Lonicero xylostei -Quercetum cerridis melicetosum uniflorae
17 - Carpino orientalis-Quercetum cerridis
18 - Coronillo emeri-Quercetum cerridis
19 - Querco cerridis-Betuletum pendulae

c = characteristic; d = differential; t = transgressive

	N. column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	N. releves	8	7	8	19	18	17	12	10	11	14	12	8	6	12	9	5	8	7	5
	Teucrio siculi-Quercenion ceridis																			
c	Erica arborea	25	29	38	70	11	6	67	90	36	50	42	62	.	.	.	20	.	.	.
c	Carex sylvatica	.	.	25	.	50	12	8	.	.	.	.	.	.	.	22	.	38	.	.
c	Lychnis flos-cuculi	.	.	25	.	11	.	.	.	9	.	58	.	.	.	.	.	.	.	.
c	Carex depauperata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11	.	.	.	.
c	Carex grioletii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	40	.	.	.
c	Quercus crenata	.	.	.	.	.	.	.	.	.	29	.	.	.	.	.	.	.	.	.
d	Cytisus scoparius	25	57	75	10	.	24	17	50	.	43	17	.	.	25	.	.	.	29	.
d	Pyracantha coccinea	13	29	.	.	33	29	17	30	9	14	.	.	.	.	22	.	.	.	.
d	Arbutus unedo	.	.	.	37	22	.	25	40	27	.	42	.	17	.	.	.	.	.	.
d	Erica scoparia	25	100	.	5	.	.	.	70	.	.	.	.	.	.	.	.	.	.	.
t	Crataegus laevigata	63	14	38	.	.	47	58	.	82	93	.	.	.	92	.	40	38	57	.
t	Hieracium racemosum	.	14	.	10	.	.	.	.	45	50	.	.	.	.	.	.	.	.	.
	Ptilostemo stricti-Quercenion cerridis																			
d	Vinca major	.	.	.	.	.	.	.	.	.	.	.	.	.	.	22	.	.	.	.
	Teucrio siculi-Quercion cerridis																			
c	Quercus frainetto	25	.	.	.	.	.	17	.	100	100	100	87	100	100	.	.	25	.	.
c	Teucrium siculum	.	.	75	.	.	6	25	.	27	57	.	.	33	17	.	.	.	.	.
c	Digitalis micrantha	38	.	38	.	.	.	8	.	.	7	.	.	.	.	.	.	.	14	.
c	Malus florentina	.	43	.	.	.	35	75	.	55	71	.	.	.	.	.	.	.	.	.
c	Silene viridiflora	.	.	38	.	.	6	.	.	18	7	.	.	.	.	.	.	.	14	.
c	Crepis leontodontoides	50	.	13	.	.	.	.	.	.	.	42	.	17	.	.	.	.	.	.
c	Echinops siculus	.	.	13	.	.	59	50	.	.	.	.	.	.	.	.	.	.	.	.
c	Iris foetidissima	.	.	.	.	6	.	.	.	.	.	.	.	.	.	.	60	.	.	.
c	Lychnis coronaria	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	38	29	.
c	Ptilostemon strictus	.	.	.	.	.	.	.	.	9	7	.	.	.	.	.	.	.	.	.
c	Cytisus villosus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13	.	.
d	Ligustrum vulgare	13	57	25	5	100	100	67	40	100	86	.	.	33	8	78	60	75	.	.
d	Mespilus germanica	13	.	13	.	.	29	8	.	.	7	.	62	50	100	.	.	.	29	.
d	Aristolochia rotunda	38	.	.	.	28	12	.	.	9	7	.	.	83	75	.	.	50	.	.
d	Genista tinctoria	.	14	.	5	.	6	8	.	.	14	.	.	.	.	.	.	.	.	.
d	Fraxinus oxycarpa	38	.	.	.	100	6	.	.	.	.	.	.	.	.	.	.	.	.	.
d	Pulicaria odora	25	.	.	.	.	.	.	50	.	.	67	.	.	.	.	.	.	.	.
d	Rumex sanguineus	.	.	.	.	11	.	.	.	.	.	.	.	.	.	.	.	25	.	.
t	Oenanthe pimpinelloides	75	14	50	.	28	.	50	20	64	64	75	.	17	25	.	20	13	.	.
t	Malus sylvestris	13	43	38	.	44	65	50	40	.	14	.	75	67	42	11	.	.	.	.
t	Lathyrus niger	25	29	50	.	11	6	67	50	82	86	67	.	.	.	.	.	.	.	.
t	Ranunculus lanuginosus	.	.	50	.	33	.	.	.	.	.	.	.	50	50	11	40	25	.	.
t	Poa sylvicola	50	.	.	.	17	.	.	.	27	7	.	.	.	.	.	.	.	.	.
t	Asperula laevigata	.	.	.	.	.	.	.	.	.	.	.	.	.	58	.	.	.	.	.
	Carpinion orientalis																			
	Cyclamen repandum	.	14	13	10	22	53	33	.	64	36	.	25	.	42	33	100	13	.	.
	Ostrya carpinifolia	25	.	.	5	6	29	.	.	9	7	8	.	.	.	33	60	50	43	.
	Asparagus acutifolius	.	.	.	16	11	.	.	60	91	7	.	100	33	.	67	100	100	.	.
	Laurus nobilis	.	.	.	10	11	.	.	.	18	.	.	12	.	.	11	80	.	.	.
	Viburnum tinus	.	.	.	16	17	.	.	.	64	.	.	.	17	.	44	60	.	.	.
	Coronilla emerus subsp. emeroides	.	.	.	.	.	53	33	.	100	29	.	.	.	.	67	100	.	.	.
	Lilium bulbiferum subsp. croceum	.	.	.	.	11	12	8	.	.	.	.	.	.	.	11	20	.	.	.
	Sanicula europaea	.	.	.	.	11	.	.	.	.	.	.	.	.	17	11	20	.	14	.
	Cytisus sessilifolius	.	.	.	.	.	12	.	.	27	.	.	12	.	.	.	.	13	.	.

Carpinus orientalis	.	.	.	.	.	.	.	.	.	.	.	62	.	.	100	100	100	.	.
Chamaecytisus hirsutus	.	.	13	.	.	.	58	20	.	.	.	.	.	.	.	.	.	.	.
Acer obtusatum	13	.	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	29	.
Laburnum anagyroides	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11	.	13	.	.
Juniperus oxycedrus	.	.	.	.	6	.	.	.	.	7	.	.	.	.	.	.	.	.	.
Melampyrum cristatum	.	14	.	.	.	.	.	.	27	.	.	.	.	.	.	.	.	.	.
Cercis siliquastrum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11	.	.	.	.
Inula salicina	.	43	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Peucedanum cervaria	.	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Erythronio-Quercion petraeae																			
Genista germanica	.	43	25	5	.	.	.	.	45	.	.	.	.	.	.	.	.	.	.
Physospermum cornubiense	13	29	.	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lathyrus montanus	.	.	75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Quercetalia pubescenti-petraeae																			
Fraxinus ornus	63	57	38	63	67	94	100	30	91	29	50	87	83	42	100	100	63	43	.
Quercus cerris	100	100	100	.	100	100	100	100	91	100	92	12	100	100	100	100	75	86	100
Sorbus domestica	50	100	88	10	39	88	100	50	82	93	92	12	.	50	44	40	13	86	.
Cornus mas	88	71	100	5	78	100	100	40	82	64	67	.	.	92	89	40	63	57	.
Sorbus torminalis	25	29	88	5	33	53	83	20	91	21	67	.	50	8	22	40	.	86	.
Stachys officinalis	63	100	100	16	39	59	100	100	55	93	92	.	33	25	.	40	13	29	.
Viola alba dehnhardtii	75	86	75	21	72	94	100	80	64	71	100	.	83	75	44	60	.	57	.
Buglossoides purpurocaerulea	63	14	.	.	22	71	17	70	73	7	58	12	.	75	22	20	25	43	.
Quercus pubescens	63	100	25	63	11	59	100	70	36	.	33	.	.	.	.	40	63	14	.
Melittis melissophyllum	25	.	38	.	44	71	67	50	.	.	.	.	.	8	22	80	.	14	.
Serratula tinctoria	13	29	25	16	33	12	75	40	55	36	.	.	.	.	.	.	.	.	.
Brachypodium rupestre	38	86	.	63	11	71	92	100	9	43	.	.	.	.	.	.	.	.	.
Hypericum montanum	.	14	50	5	.	6	8	20	.	29	.	.	.	.	.	.	.	.	.
Agrimonia eupatoria	38	.	.	.	.	18	33	.	36	14	67	.	.	17	.	.	.	.	.
Acer monspessulanum	38	.	.	.	39	82	75	.	.	.	58	.	.	17	.	.	.	.	.
Lonicera etrusca	50	.	.	.	67	.	.	80	27	14	.	.	.	.	.	.	13	.	.
Scutellaria columnae	.	.	63	.	.	47	25	.	.	.	.	.	.	58	.	.	13	43	.
Silene italica subsp. italica	13	29	50	.	.	.	.	.	18	7	.	.	.	.	.	.	.	.	.
Arum italicum	.	.	.	.	.	.	.	.	9	.	.	.	.	25	.	80	13	.	.
Helleborus foetidus	50	.	.	.	.	6	.	.	27	7	.	.	.	.	.	.	.	.	.
Aristolochia lutea	.	.	.	.	.	18	8	.	.	.	.	.	.	.	.	.	.	29	.
Asparagus tenuifolius	.	.	.	.	11	47	33	.	.	.	.	.	.	.	.	.	.	.	.
Melica arrecta	.	.	.	.	.	6	.	.	.	.	58	50	.	.	.	.	.	.	.
Orchis purpurea	.	14	.	.	.	18	.	.	.	.	.	.	.	.	.	.	.	.	.
Fagetalia sylvaticae																			
Anemone nemorosa	25	.	63	10	11	.	.	20	.	.	.	.	.	.	.	.	.	.	.
Poa nemoralis	.	.	13	10	11	.	.	.	.	.	33	.	.	.	.	.	.	14	.
Moehringia trinervia	.	.	25	.	.	12	.	.	.	.	.	.	17	8	.	.	.	.	.
Vicia sepium	.	.	13	.	11	6	17	.	.	.	.	.	.	.	.	.	.	.	.
Asarum europaeum	.	.	.	.	.	.	.	.	27	7	.	.	.	.	.	.	.	14	.
Euphorbia dulcis	.	.	25	.	17	.	8	.	.	.	.	.	.	.	.	.	.	.	.
Dactylorhiza maculata	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	20	.	.	.
Acer pseudoplatanus	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	29	.
Ulmus glabra	.	.	.	.	.	.	.	.	45	21	.	.	.	.	.	.	.	.	.
Vinca minor	.	.	.	.	.	.	.	.	18	14	.	.	.	.	.	.	.	.	.
Arum maculatum	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cephalanthera rubra	.	.	.	.	.	.	.	.	.	.	.	.	.	.	22	.	.	.	.
Fagus sylvatica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	14	.
Galium rotundifolium	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Geranium robertianum	.	.	.	.	.	24	.	.	.	.	.	.	.	.	.	.	.	.	.
Mercurialis perennis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13	.	.
Salvia glutinosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11	.	.	.	.
Stellaria holostea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	29	.
Tilia cordata	.	.	.	.	.	.	.	.	.	.	8	.	.	.	.	.	.	.	.
Quercetalia robori-petraeae																			
Teucrium scorodonia	25	43	.	16	.	.	.	20	.	.	.	.	.	.	.	.	.	.	.
Genista pilosa	.	14	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla erecta	.	14	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Calluna vulgaris	.	43	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Holcus mollis	.	.	50	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Viola canina	.	.	.	.	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Deschampsia flexuosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	20
Populetalia albae																			
Populus tremula	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Carex pendula	.	.	.	.	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Circaea lutetiana	.	.	.	.	.	.	.	.	.	.	.	.	.	17	.	.	.	.	.
Symphytum bulbosum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	60	.	.	.
Querco-Fagetea																			
Hedera helix	88	57	50	84	94	94	58	90	100	100	58	100	100	100	100	100	88	71	.
Ruscus aculeatus	63	71	75	37	89	94	100	70	100	79	92	75	83	100	100	100	88	86	.
Tamus communis	75	57	75	10	72	76	67	40	100	43	83	37	33	75	67	20	75	57	.
Acer campestre	75	57	38	.	83	88	83	60	91	57	75	12	67	92	100	40	88	43	.
Brachypodium sylvaticum	88	.	50	32	78	88	67	60	64	79	67	87	83	50	22	40	38	29	.
Luzula forsteri	50	86	100	21	17	59	67	30	9	64	83	25	83	58	.	20	.	57	.
Viola riviniana+reichenbachiana	63	57	88	16	39	18	8	30	36	50	25	.	17	67	44	60	.	14	.
Festuca heterophylla	75	43	100	52	11	65	100	80	91	79	83	.	33	17	.	100	.	43	.
Lathyrus venetus	13	.	25	5	22	65	25	.	18	36	67	12	100	58	22	100	.	71	.
Melica uniflora	88	.	63	5	44	71	58	.	55	29	42	.	50	75	11	100	75	.	.
Cruciata glabra	63	100	100	32	61	59	100	100	27	86	100	.	.	.	.	.	13	71	.
Ajuga reptans	38	14	.	21	56	12	.	30	45	64	83	.	100	50	22	.	.	.	.

Cyclamen hederifolium	.	.	75	.	39	41	58	.	55	36	.	12	67	42	56	20	50	.	.
Fragaria vesca	63	43	75	10	.	.	17	70	9	79	75	.	17	17	.	.	.	71	.
Clematis vitalba	63	14	13	37	17	6	.	30	.	.	.	12	.	.	22	.	25	43	.
Lonicera caprifolium	.	43	100	.	.	94	92	.	45	36	.	.	67	75	.	100	38	43	.
Euphorbia amygdaloides	38	.	13	5	.	.	.	.	45	7	.	.	17	42	44	.	13	71	.
Primula vulgaris	13	.	63	5	39	.	8	.	9	.	.	.	.	8	.	40	13	14	.
Quercus petraea	38	43	88	.	17	12	25	80	9	.	.	.	.	.	.	60	.	.	.
Carpinus betulus	38	.	50	.	17	24	.	.	.	.	8	.	83	83	.	.	.	57	.
Daphne laureola	38	.	13	5	39	53	83	.	.	.	.	.	33	100	.	.	.	.	.
Anemone apennina	.	.	25	.	11	29	25	.	18	.	42	.	.	.	11	.	.	.	.
Prunus avium	38	86	25	16	.	.	.	.	45	57	.	.	.	.	11	.	.	.	.
Symphytum tuberosum	50	.	63	.	50	47	50	.	.	.	.	.	.	25	.	.	25	.	.
Lonicera xylosteum	13	71	.	.	.	.	.	.	.	29	.	.	.	8	78	60	.	.	.
Helleborus bocconei subsp. bocconei	25	.	.	.	33	18	25	50	.	.	.	.	.	.	33	.	.	.	.
Lathyrus sylvestris	.	71	.	.	11	18	42	.	27	.	50	.	.	.	.	.	.	.	.
Potentilla micrantha	.	.	75	.	.	29	42	.	64	43	.	.	.	50	.	.	.	.	.
Rosa arvensis	.	.	88	.	.	47	58	.	45	64	.	.	.	75	.	.	.	.	.
Ulmus minor	50	.	.	.	56	18	.	20	.	.	.	.	.	.	11	.	13	.	.
Allium pendulinum	.	.	75	.	17	18	33	.	.	.	.	.	.	.	.	80	.	.	.
Castanea sativa	.	.	25	100	.	.	.	.	.	.	.	.	.	.	.	.	25	86	20
Cephalanthera longifolia	.	.	75	10	11	.	8	.	.	.	.	.	.	17	.	.	.	.	.
Ilex aquifolium	.	.	.	5	17	.	.	.	.	.	8	.	.	75	.	20	.	.	.
Campanula trachelium	.	.	13	5	.	.	.	20	.	.	.	.	.	.	.	.	.	43	.
Corylus avellana	.	.	.	5	.	.	.	.	.	.	8	.	.	.	.	.	38	57	.
Geum urbanum	.	.	.	.	.	6	.	.	27	14	.	.	.	33	.	.	.	.	.
Hieracium sylvaticum	.	.	100	.	.	.	.	.	.	43	.	.	.	25	.	.	13	.	.
Neottia nidus-avis	.	.	13	5	.	.	8	.	.	.	.	.	.	8	.	.	.	.	.
Solidago virgaurea	.	29	.	32	.	.	33	.	.	29	.	.	.	.	.	.	.	.	.
Platanthera clorantha	.	.	.	.	.	.	.	.	18	21	.	.	.	.	.	40	.	.	.
Cephalanthera damasonium	.	.	.	5	.	.	.	.	27	14	.	.	.	.	.	.	.	.	.
Hieracium gr. murorum	.	14	.	10	.	.	.	.	.	.	.	.	.	.	.	20	.	.	.
Platanthera bifolia	.	14	.	.	.	.	8	.	.	.	.	.	.	50	.	.	.	.	.
Bromus ramosus	.	.	.	.	.	35	17	.	.	.	.	.	.	.	.	.	.	.	.
Calamintha sylvatica	.	.	.	.	.	.	.	.	27	14	.	.	.	.	.	.	.	.	.
Epipactis helleborine	.	.	.	.	.	6	8	.	.	.	.	.	.	.	.	.	.	.	.
Hepatica nobilis	.	.	.	.	.	.	8	.	.	.	.	.	.	.	11	.	.	.	.
Vicia grandiflora	.	.	.	.	.	6	.	.	.	.	.	.	.	42	.	.	.	.	.
Luzula sylvatica	.	.	.	.	.	6	.	.	.	.	.	.	.	.	.	20	.	.	.
Aremonia agrimonoides	.	.	.	.	6	.	.	.	.	.	.	.	.	.	11	.	.	.	.
Chaerophyllum temulentum	.	.	.	.	.	.	.	.	.	.	.	.	.	33	.	.	.	29	.
Lapsana communis	.	.	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	29	.
Quercus robur	.	.	.	.	.	.	.	.	.	.	.	25	67	.	.	.	.	.	.
Rubus hirtus	.	.	88	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Betula pendula	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	100
Hieracium lachenalii	.	29	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Carex digitata	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pulmonaria apennina	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	29	.
Viola odorata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	88	.	.
Rhamno-Prunetea and Cytisetea scopario-striati																			
Crataegus monogyna	88	86	88	42	89	100	100	100	64	50	92	75	67	42	100	80	100	29	.
Prunus spinosa	100	86	50	.	50	82	92	90	73	86	100	12	33	58	67	40	.	29	.
Rubus ulmifolius	50	.	13	63	39	76	50	60	9	50	83	75	100	100	.	.	75	86	20
Euonymus europaeus	88	.	38	.	61	88	25	50	73	14	.	12	83	92	44	80	.	14	.
Juniperus communis	50	100	88	16	17	76	100	80	100	93	33	.	.	.	.	20	.	.	.
Pyrus pyraster	88	.	75	5	28	88	67	50	18	21	67	.	.	.	33	20	.	.	.
Rosa canina	50	14	.	.	11	6	33	30	27	14	.	.	.	.	.	.	.	86	.
Cornus sanguinea	.	.	.	16	.	35	.	40	64	43	.	.	.	.	56	40	.	29	.
Rosa gallica	50	.	13	.	.	12	25	20	18	7	.	.	.	.	.	.	.	.	.
Osyris alba	.	.	.	.	.	.	17	.	73	29	.	.	.	.	.	.	25	.	.
Rubus canescens	38	.	.	.	.	.	.	30	.	.	.	.	.	.	22	.	.	.	.
Coronilla emerus	.	.	.	32	.	.	.	.	.	.	.	.	.	.	.	.	.	100	.
Spartium junceum	.	.	.	.	.	.	.	20	.	.	.	.	.	.	.	.	.	.	.
Paliurus spina-christi	.	.	.	.	.	.	.	20	.	.	.	.	.	.	.	.	.	.	.
Prunus mahaleb	.	.	.	.	.	.	.	.	9	.	.	.	.	.	.	.	.	.	.
Rhamnus catharticus	.	.	.	.	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rosa micrantha	.	.	.	.	.	.	8	.	.	.	.	.	.	.	.	.	.	.	.
Sambucus nigra	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	14	.
Ulex europaeus	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Quercetea ilicis																			
Rosa sempervirens	50	.	.	10	39	100	83	90	64	21	50	25	17	33	56	40	63	.	.
Rubia peregrina	.	14	.	79	67	82	58	30	73	7	.	100	100	67	78	100	75	.	.
Asplenium onopteris	13	.	13	5	11	18	8	30	.	.	.	12	.	.	.	100	38	.	.
Quercus ilex	.	.	.	26	78	53	25	60	73	.	33	12	.	.	78	.	.	.	.
Smilax aspera	.	.	.	16	11	6	.	.	9	.	.	87	17	.	78	100	63	.	.
Phillyrea latifolia	.	.	.	5	67	65	50	20	.	.	50	50	.	.	33	.	.	.	.
Rhamnus alaternus	.	.	.	10	.	.	.	.	9	.	.	.	.	.	22	.	.	.	.
Phillyrea angustifolia	.	.	.	.	11	.	.	40	.	.	.	12	.	.	.	.	.	.	.
Inula conyza	.	43	.	.	.	.	.	.	18	14	.	.	.	.	.	.	.	.	.
Clematis flammula	.	.	.	.	.	.	.	50	.	.	.	50	.	.	.	.	.	.	.
Carex distachya	.	.	.	.	.	.	.	.	.	.	33	.	.	.	11	.	.	.	.
Myrtus communis	.	.	.	.	11	.	.	.	.	.	.	12	.	.	.	.	.	.	.
Carex hallerana	.	.	.	.	.	.	.	30	.	.	.	.	.	.	.	.	.	.	.
Pistacia lentiscus	.	.	.	.	.	.	.	20	.	.	.	.	.	.	.	.	.	.	.
Carex olbiensis	.	.	.	.	.	.	.	.	.	.	33	.	.	.	.	.	.	.	.
Daphne gnidium	.	.	.	.	.	.	.	50	.	.	.	.	.	.	.	.	.	.	.
Quercus suber	.	.	.	.	.	.	.	.	.	.	.	100	.	.	.	.	.	.	.

Other species																			
Carex flacca	25	86	50	.	44	71	100	80	55	79	33	.	.	.	.	.	.	.	.
Clinopodium vulgare	38	43	25	.	.	6	.	50	9	64	58	.	.	8	.	.	.	43	.
Dactylis glomerata	75	29	63	.	.	35	92	30	.	7	83	.	.	67	.	.	.	57	.
Pteridium aquilinum	13	.	13	.	.	.	.	.	.	21	.	87	50	50	.	.	.	57	100
Geranium sanguineum	25	14	.	.	.	6	58	50	9	7	.	.	.	.	.	.	.	.	.
Prunella vulgaris	38	.	.	.	17	.	8	.	18	43	.	.	.	17	11	.	.	.	.
Teucrium chamaedrys	25	29	.	.	.	.	17	.	9	7	67	.	.	.	.	.	.	.	.
Galium aparine	.	.	.	.	6	12	.	.	.	.	.	.	.	33	11	20	.	.	.
Anthoxanthum odoratum	.	57	25	.	.	.	8	.	.	.	50	.	.	.	.	.	.	.	.
Campanula rapunculus	50	14	.	.	.	.	.	20	.	.	58	.	.	.	.	.	.	.	.
Filipendula vulgaris	25	.	.	.	.	.	17	30	.	.	25	.	.	.	.	.	.	.	.
Ranunculus bulbosus	.	14	.	.	.	6	8	.	.	.	67	.	.	.	.	.	.	.	.
Sedum cepaea	.	.	25	.	.	6	.	.	.	.	.	.	.	25	.	.	.	43	.
Stellaria media	.	.	25	.	.	6	.	.	.	.	.	.	33	33	.	.	.	.	.
Agrostis tenuis	.	.	.	.	.	.	25	50	.	7	.	.	.	.	.	.	.	.	.
Anthericum liliago	.	29	.	.	.	6	25	.	.	.	.	.	.	.	.	.	.	.	.
Cruciata laevipes	.	.	.	.	.	.	.	.	18	36	.	.	.	.	.	.	25	.	.
Luzula campestris	.	.	.	.	.	.	.	.	18	14	.	.	17	.	.	.	.	.	.
Pyrus communis	.	.	.	.	.	12	.	.	.	.	.	.	.	25	.	.	.	14	.
Veronica officinalis	.	14	.	.	.	.	.	.	9	21	.	.	.	.	.	.	.	.	.
Allium triquetrum	.	.	.	.	11	.	.	.	.	.	.	.	50	.	.	.	.	.	.
Asplenium adiantum-nigrum	.	43	.	.	.	.	.	.	.	.	.	.	.	.	11	.	.	.	.
Astragalus glycyphyllos	.	.	.	5	.	6	.	.	.	.	.	.	.	.	.	.	.	.	.
Centaurea bracteata	.	.	.	.	.	.	.	.	18	14	.	.	.	.	.	.	.	.	.
Echinops ritro	.	.	.	.	.	.	.	.	.	.	50	.	.	.	.	.	.	29	.
Galium album	.	.	.	.	.	.	.	.	.	.	.	.	.	42	.	.	.	.	20
Holcus lanatus	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	40
Orobanche hederae	.	.	13	.	.	.	.	.	.	.	.	.	.	.	.	40	.	.	.
Poa trivialis	.	.	.	.	.	.	.	.	.	.	50	.	.	.	.	.	13	.	.
Ranunculus polyanthemos	38	.	.	.	.	.	.	30	.	.	.	.	.	.	.	.	.	.	.
Tanacetum corymbosum	.	.	.	5	.	.	33	.	.	.	.	.	.	.	.	.	.	.	.
Vicia bithynica	.	.	.	.	.	29	8	.	.	.	.	.	.	.	.	.	.	.	.
Aegopodium podagraria	.	.	.	.	.	.	.	.	.	.	.	.	.	33	.	.	.	.	.
Agrostis canina subsp. Montelucci	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	60
Asphodelus albus	.	.	.	.	.	.	8	.	.	.	.	.	.	.	.	.	.	.	.
Asphodelus microcarpus	.	.	.	.	.	.	.	.	.	.	33	.	.	.	.	.	.	.	.
Brachypodium ramosum	.	.	.	.	.	.	.	.	.	.	33	.	.	.	.	.	.	.	.
Bromus erectus	.	29	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cardamine impatiens	.	.	.	.	.	.	.	.	.	.	.	.	.	17	.	.	.	.	.
Centaurium erythraea	.	.	.	.	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cistus salvifolius	.	43	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Convolvulus arvensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	29	.
Dianthus seguieri	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Geranium purpureum	.	.	.	.	.	.	.	.	.	.	.	.	67	.	.	.	.	.	.
Glechoma hederacea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	20	.	.	.
Gymnadenia conopsea	.	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Juncus effusus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	40
Lamium bifidum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11	.	.	.	.
Lathyrus aphaca	.	.	.	.	.	12	.	.	.	.	.	.	.	.	.	.	.	.	.
Lathyrus climenum	.	29	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lathyrus hirsutus	.	.	.	.	.	.	.	20	.	.	.	.	.	.	.	.	.	.	.
Leopoldia comosa	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lotus corniculatus	.	.	.	.	.	.	.	20	.	.	.	.	.	.	.	.	.	.	.
Luzula multiflora	.	43	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Malus domestica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	60
Melica ciliata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	57	.
Molinia arundinacea	.	.	.	26	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Molinia coerulea	.	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Orchis simia	.	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pinus pinaster	.	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ranunculus ficaria	.	.	.	.	.	.	.	.	.	.	.	.	17	.	.	.	.	.	.
Ranunculus repens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	14	.
Robinia pseudoacacia	.	.	.	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Serapias cordigera	.	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Simethis mattiazzi	.	.	.	.	.	.	.	.	.	.	25	.	.	.	.	.	.	.	.
Trifolium ochroleucum	.	.	.	.	.	.	.	.	.	.	50	.	.	.	.	.	.	.	.
Trifolium rubens	.	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Urospermum dalechampii	.	.	.	.	.	.	.	.	.	.	42	.	.	.	.	.	.	.	.
Vicia cracca	.	.	.	.	.	.	.	50	.	.	.	.	.	.	.	.	.	.	.
Vicia loiseleurii	.	.	.	.	.	12	.	.	.	.	.	.	.	.	.	.	.	.	.
Vicia sativa	.	.	.	.	.	18	.	.	.	.	.	.	.	.	.	.	.	.	.
Vincetoxicum hirundinaria	.	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Tab. 6 - Ptilostemo stricti - Quercenion cerridis

1 - Physospermo verticillati-Quercetum cerridis fraxinetosum orni
2 - Physospermo verticillati-Quercetum cerridis allietosum pendulini
3 - Physospermo verticillati-Quercetum cerridis
4 - Physospermo verticillati-Quercetum cerridis abieti-fagetosum sylvaticae
5 - Lathyro-jordanii-Quercetum cerris
6 - Centaureo centaurii-Quercetum pubescentis
7 - Lathyro digitati-Quercetum cerridis clematidetosum
8 - Lathyro digitati-Quercetum cerridis anemonetosum
9 - Cytiso villosi-Quercetum frainetto
10 - Stipo bromoidis-Quercetum frainetto
11 - Echinopo siculi-Quercetum frainetto

c = characteristic; d = differential; t = transgressive

	N. column	1	2	3	4	6	7	8	9	11	12	13
	N. releves	10	13	17	15	9	8	4	12	30	12	20
	Ptilostemo stricti-Quercenion cerridis											
c	Lathyrus digitatus	20	46	59	47	11	38	25	33	.	.	.
c	Physospermum verticillatum	70	46	71	33	22	25	.	.	3	.	.
c	Helleborus bocconei subsp. siculus	.	8	12	13	.	.	.	17	37	42	.
c	Heptaptera angustifolia	40	46	59	27	.	25	.	.	.	.	.
c	Lathyrus grandiflorus	40	23	18	20	.	.	.	8	.	.	.
c	Melittis albida	.	.	.	.	33	50	25	50	.	42	.
c	Echinops sphaerocephalus subsp albidus	.	.	.	.	44	38	75	25	.	.	.
c	Vicia barbazitae	30	31	.	.	33	.	.	.	.	.	.
c	Lathyrus jordanii	.	.	.	.	89	.	.	.	.	8	.
c	Paeonia mascula	.	.	12	13	.	.	.	.	.	.	.
d	Pimpinella anysoides	.	62	6	40	44	.	.	17	.	17	.
d	Vinca major	60	.	.	.	11	.	50	8	7	.	.
d	Stipa bromoides	.	.	.	.	.	25	.	.	10	67	5
d	Stachys heraclea	.	.	.	.	.	.	75	25	.	.	.
d	Trifolium patulum	.	.	.	.	11	.	.	8	.	.	.
t	Euphorbia corallioides	30	23	24	33	.	.	.	.	.	.	.
t	Digitalis ferruginea	10	.	6	27	.	.	.	.	.	.	.
t	Huetia cynapioides	.	.	.	.	11	.	.	33	.	.	.
t	Centaurea centaurium	.	.	.	.	.	88	.	.	.	.	.
	Teucrio siculi-Quercenion cerridis											
c	Carex sylvatica	30	31	18	7	.	.	.	.	.	.	.
c	Erica arborea	.	.	.	.	.	.	.	.	77	83	60
c	Lychnis flos-cuculi	.	.	.	.	.	.	.	.	.	.	5
d	Arbutus unedo	.	.	.	.	.	.	.	.	3	.	.
t	Crataegus laevigata	.	.	.	.	33	.	.	8	.	.	20
	Teucrio siculi-Quercion cerridis											
c	Quercus frainetto	20	85	24	.	67	25	50	67	100	100	100
c	Crepis leontodontoides	10	23	12	.	56	13	25	33	50	75	30
c	Cytisus villosus	40	77	.	.	56	13	25	8	97	17	55
c	Veronica chamaedrys	30	85	6	13	44	.	.	25	3	33	25
c	Ptilostemon strictus	30	92	35	53	.	13	25	50	.	.	10
c	Digitalis micrantha	20	.	12	7	.	.	.	42	40	25	5
c	Teucrium siculum	.	.	.	.	67	13	50	17	97	100	90
c	Echinops siculus	.	.	.	.	.	.	.	.	.	33	50
c	Lychnis coronaria	20	31	.	.	.	.	.	.	.	.	.
c	Malus florentina	.	.	.	.	33	.	.	.	.	17	.
c	Silene viridiflora	.	.	.	.	.	.	.	8	10	.	.
d	Ligustrum vulgare	20	.	6	.	56	.	50	8	.	.	40
d	Alliaria petiolata	30	38	18	13	.	.	.	8	.	.	.
d	Genista tinctoria	.	15	41	7	.	.	.	33	.	.	65
d	Pulicaria odora	.	.	.	.	22	.	25	.	3	25	25
d	Rumex sanguineus	20	23	18	33	.	.	.	.	.	.	.
d	Aristolochia rotunda	.	.	.	.	.	.	.	.	.	50	.
t	Malus sylvestris	70	54	71	87	22	38	.	.	27	17	25
t	Lathyrus niger	.	38	47	13	.	.	.	33	30	50	60
t	Oenanthe pimpinelloides	.	.	.	.	67	.	25	17	40	83	65
t	Ranunculus lanuginosus	40	62	65	73	.	.	.	25	.	.	25
t	Asperula laevigata	.	.	.	.	33	.	25	17	.	17	20
t	Poa sylvicola	.	8	.	20	33	.	.	.	53	50	.
t	Hypericum perfoliatum	.	.	.	.	.	.	50	8	.	8	.
	Carpinion orientalis											
	Carpinus orientalis	70	46	18	60	44	25	100	17	.	.	85
	Asparagus acutifolius	60	8	.	.	22	63	100	.	3	50	25
	Lilium bulbiferum subsp. croceum	30	46	18	27	.	.	25	25	.	.	.
	Ostrya carpinifolia	40	8	.	.	.	.	.	17	10	17	5
	Sesleria autumnalis	10	15	12	.	11	13	.	.	.	42	.

Chamaecytisus hirsutus	.	46	18	.	.	25	.	50	.	17	.
Acer obtusatum	30	8	.	.	.	.	.	42	30	25	.
Sanicula europaea	.	.	.	53	.	.	.	.	10	.	5
Cytisus sessilifolius	.	.	.	.	.	38	50	8	.	.	.
Arabis turrita	30	23	.	.	.	.	.	.	7	.	.
Cnidium silaifolium	.	.	35	40	.	.	.	.	.	.	.
Anemone hortensis	.	.	.	.	.	.	.	.	.	8	.
Pistacia terebinthus	.	.	.	.	.	.	25	.	.	.	.
Knautia purpurea	.	.	.	.	.	.	.	17	.	.	.
Colutea arborescens	.	.	.	.	.	.	25	.	.	.	.
Pino-Quercion congestae											
Agropyron panormitanum	.	.	.	.	.	.	.	.	10	.	.
Scutellaria columnae subsp. gussonei	.	.	.	.	.	.	.	.	17	.	.
Silene sicula	.	.	.	.	.	.	.	.	53	.	.
Quercetalia pubescenti-petraeae											
Quercus cerris	100	100	100	100	78	88	75	100	47	75	100
Scutellaria columnae	40	69	41	40	33	38	.	50	.	25	20
Silene italica subsp. italica	100	92	41	7	44	75	75	58	.	.	15
Sorbus domestica	30	8	.	.	56	25	50	33	17	17	75
Aristolochia lutea	10	54	24	.	44	13	.	25	.	8	25
Buglossoides purpurocaerulea	70	.	.	.	11	75	75	17	7	83	20
Fraxinus ornus	80	.	.	.	33	50	100	17	20	33	75
Sorbus torminalis	30	8	.	.	22	.	25	42	13	8	60
Helleborus foetidus	50	54	18	40	11	.	.	17	.	.	5
Lonicera etrusca	20	15	18	20	.	.	25	25	.	.	55
Stachys officinalis	10	54	12	.	67	75	.	.	.	25	80
Agrimonia eupatoria	.	31	.	13	33	.	50	.	.	42	55
Quercus pubescens	50	.	.	.	67	100	25	.	.	42	10
Viola alba dehnhardtii	.	.	.	.	44	50	25	.	47	67	85
Cornus mas	90	.	12	7	11	.	.	.	.	.	10
Ranunculus neapolitanus	20	15	.	.	44	25	.	.	.	.	.
Acer monspessulanum	70	.	.	.	.	.	100	8	.	25	.
Brachypodium rupestre	.	.	.	.	44	50	.	.	.	25	15
Melittis melissophyllum	30	8	.	.	.	.	.	.	.	.	40
Arum italicum	.	.	.	.	22	.	.	.	.	.	5
Peucedanum oroselinum	.	.	.	.	.	.	25	8	.	.	.
Serratula tinctoria	.	.	.	.	.	25	.	.	.	.	5
Melica arrecta	.	.	.	.	.	.	.	.	3	.	.
Fagetalia sylvaticae											
Anthriscus nemorosa	30	62	65	60	.	13	.	.	.	.	.
Doronicum orientale	40	85	35	87	.	.	.	42	.	.	.
Lamium flexuosum	60	.	6	40	11	.	.	.	17	.	.
Polygonatum multiflorum	10	77	18	33	11	.	.	.	.	.	.
Scilla bifolia	30	46	65	73	.	25	.	.	.	.	.
Geranium robertianum	20	.	.	13	.	50	.	17	.	.	.
Geranium versicolor	.	.	.	80	.	.	.	8	17	.	.
Hypochoeris laevigata	.	.	.	.	.	.	.	17	43	42	.
Poa nemoralis	.	.	.	.	.	.	.	17	.	8	5
Stachys sylvatica	30	15	29	.	.	.	.	.	.	.	.
Abies alba	.	.	35	60	.	.	.	.	.	.	.
Corydalis cava	.	.	6	40	.	.	.	.	.	.	.
Arum maculatum	.	.	.	.	.	.	.	8	.	.	.
Cephalanthera rubra	.	.	.	.	.	.	.	.	7	.	.
Fagus sylvatica	.	.	.	73	.	.	.	.	.	.	.
Galium rotundifolium	.	.	.	.	.	.	.	.	3	.	.
Luzula sieberi subsp. sicula	.	.	.	.	.	.	.	.	27	.	.
Ranunculus brutius	.	.	.	20	.	.	.	.	.	.	.
Alnus cordata	.	.	.	.	.	.	.	8	.	.	.
Populetalia albae											
Ranunculus velutinus	.	.	.	.	11	.	.	.	.	.	.
Symphytum bulbosum	.	.	.	.	.	.	.	.	7	.	.
Querco-Fagetea											
Brachypodium sylvaticum	100	77	65	93	78	38	50	50	83	75	55
Lathyrus venetus	80	92	82	73	22	50	50	75	50	25	55
Luzula forsteri	40	92	76	87	89	13	50	92	40	42	60
Ruscus aculeatus	100	62	12	7	56	63	100	33	37	50	75
Tamus communis	100	38	12	13	56	50	100	42	27	83	50
Acer campestre	90	23	35	80	33	38	75	33	3	.	35
Aremonia agrimonoides	60	92	88	100	67	50	.	67	40	50	5
Cyclamen hederifolium	90	85	65	93	100	38	.	17	3	25	15
Festuca heterophylla	50	100	71	53	56	.	25	67	77	17	5
Geum urbanum	30	46	47	80	22	13	.	50	7	8	15
Hedera helix	60	23	41	47	11	25	25	17	17	.	55
Anemone apennina	80	92	71	87	33	50	50	67	.	.	5
Melica uniflora	50	54	41	60	.	13	.	25	23	8	20
Clematis vitalba	40	8	12	7	.	.	25	8	13	17	.
Potentilla micrantha	50	69	76	80	.	.	25	58	70	.	25
Symphytum tuberosum	30	85	41	100	11	13	.	25	.	25	.
Ajuga reptans	20	54	29	33	22	.	.	8	.	.	25
Daphne laureola	90	92	76	87	.	.	.	25	30	.	5
Fragaria vesca	.	69	24	20	22	.	.	17	.	25	35

Primula vulgaris	60	62	65	93	11	.	.	17	.	.	30
Rosa arvensis	30	8	53	93	67	25	.	.	20	.	.
Rubus hirtus	20	69	41	80	.	13	.	.	40	8	.
Cardamine graeca	20	54	41	47	.	13	.	33	.	.	.
Ilex aquifolium	30	8	59	60	.	.	.	8	10	.	.
Allium pendulinum	80	77	.	.	11	.	.	8	.	.	5
Euphorbia amygdaloides	50	.	12	33	11	.	.	.	.	.	35
Thalictrum aquilegifolium	.	38	18	7	11	.	.	.	.	17	.
Viola riviniana+reichenbachiana	.	54	24	40	.	25	.	.	.	.	10
Viola hirta	80	38	41	.	.	.	.	8	.	.	.
Castanea sativa	.	.	.	.	.	.	.	17	50	8	5
Pulmonaria apennina	10	.	47	93	.	.	.	.	.	.	5
Campanula trachelium	10	23	.	.	.	.	.	.	.	.	5
Lonicera caprifolium	.	.	.	.	44	.	.	.	7	.	30
Myosotis sylvatica	.	54	.	.	.	13	.	17	.	.	.
Prunus avium	.	.	.	.	11	.	.	.	.	8	20
Ulmus minor	40	.	.	.	.	.	25	.	.	.	15
Cardamine bulbifera	.	.	18	60	.	.	.	.	.	.	.
Chaerophyllum temulentum	.	.	.	.	.	.	25	8	.	.	.
Corylus avellana	.	46	.	.	.	.	.	8	.	.	.
Crocus neapolitanus	.	.	24	27	.	.	.	.	.	.	.
Festuca exaltata	.	.	.	.	.	.	.	.	20	.	65
Hieracium gr. murorum	.	.	.	.	.	.	.	.	17	8	.
Polystichum setiferum	.	.	.	.	.	.	.	8	17	.	.
Silene latifolia	.	.	.	.	22	25	.	.	.	.	.
Bromus ramosus	.	.	.	.	22	.	.	.	.	.	.
Euonymus latifolius	.	.	.	.	.	.	.	8	.	.	.
Tilia platyphyllos	.	.	.	.	.	.	.	8	.	.	.
Luzula sylvatica	.	.	.	.	.	.	.	8	.	.	.
Calamintha grandiflora	.	.	.	.	.	.	.	.	23	.	.
Carpinus betulus	.	.	.	.	.	.	.	.	.	.	5
Cephalanthera longifolia	.	.	.	.	.	.	.	.	10	.	.
Dryopteris filix-mas	.	.	.	.	.	.	.	.	3	.	.
Euphorbia amygdaloides subsp. arbuscula	.	.	.	.	.	.	.	.	30	.	.
Mycelis muralis	.	.	.	.	.	.	.	.	3	.	.
Neottia nidus-avis	.	.	.	.	.	13	.	.	.	.	.
Silene nutans	.	.	.	.	11	.	.	.	.	.	.
Rhamno-Prunetea											
Crataegus monogyna	90	100	100	100	89	100	100	58	60	100	95
Prunus spinosa	50	15	47	53	67	88	50	33	20	50	60
Euonymus europaeus	70	31	53	87	33	38	.	8	3	8	25
Pyrus pyraster	30	23	6	.	.	13	50	17	.	25	80
Rosa canina	60	85	82	60	.	.	.	25	23	8	30
Rubus ulmifolius	50	31	53	53	56	.	.	.	.	42	.
Cornus sanguinea	.	.	.	.	33	.	50	17	.	17	30
Coronilla emerus	40	.	.	.	.	38	.	17	.	.	5
Osyris alba	.	.	.	.	.	38	25	.	.	.	.
Spartium junceum	.	.	.	.	.	13	.	.	.	.	.
Prunus cocomilia	.	.	.	.	.	.	.	.	.	8	.
Pyrus amygdaliformis	.	.	.	.	.	.	.	.	.	8	.
Rhamnus catharticus	.	.	.	.	.	.	.	.	.	.	5
Rubus canescens	.	.	.	.	.	.	.	.	43	.	.
Quercetea ilicis											
Rubia peregrina	.	.	.	.	.	38	50	.	13	25	20
Carex distachya	.	.	.	.	33	25	.	.	20	33	.
Asplenium onopteris	.	.	.	.	.	.	50	17	23	58	.
Quercus ilex	.	.	.	.	.	.	25	8	53	17	.
Phillyrea latifolia	.	.	.	.	.	.	50	.	.	50	5
Rosa sempervirens	.	.	.	.	.	25	.	.	.	67	70
Smilax aspera	.	.	.	.	.	.	25	.	.	17	25
Clematis flammula	.	.	.	.	.	.	75	.	.	25	.
Carex hallerana	.	.	.	.	11	25	.	.	.	.	.
Pistacia lentiscus	.	.	.	.	.	13	25	.	.	.	.
Calicotome infesta	.	.	.	.	.	.	.	.	17	17	.
Carex olbiensis	.	.	.	.	.	.	.	.	.	17	5
Arisarum vulgare	.	.	.	.	.	.	.	8	.	.	.
Lonicera implexa	.	.	.	.	.	13	.	.	.	.	.
Other species											
Anthoxanthum odoratum	10	46	29	.	67	25	25	50	17	17	15
Dactylis glomerata	50	92	71	73	78	88	.	42	83	58	40
Geranium sanguineum	30	46	24	7	33	38	50	42	10	25	.
Clinopodium vulgare	20	.	12	.	22	50	100	50	93	83	35
Cruciata laevipes	20	23	12	7	11	13	.	.	.	.	5
Trifolium pratense	.	38	18	13	56	13	.	.	.	42	25
Galium aparine	.	15	12	40	33	.	.	.	.	8	5
Lathyrus aphaca	.	.	24	20	56	25	.	.	.	8	5
Silene vulgaris	10	31	18	.	11	38	.	25	.	.	.
Asphodelus albus	.	85	59	27	11	25	.	.	.	.	.
Bellis perennis	.	54	29	.	22	25	.	.	.	.	5
Orchis mascula	10	46	35	47	22	.	.	.	.	.	.
Ranunculus millefoliatus	.	23	65	47	22	13	.	.	.	.	.

Stellaria media	10	38	18	20	11	.	.	.	.	.	.
Teucrium chamaedrys	.	.	.	.	11	25	.	.	27	17	10
Dorycnium hirsutum	.	.	.	.	.	38	50	8	.	33	.
Arctium nemorosum	10	8	12	13	.	.	.	.	.	.	.
Carex flacca	.	.	.	.	33	13	.	.	.	58	30
Cistus salvifolius	.	.	.	.	22	13	.	.	27	8	.
Galium lucidum	.	.	.	.	33	50	50	58	.	.	.
Galium mollugo	20	8	47	7	.	.	.	.	.	.	.
Geranium lucidum	10	.	41	7	.	.	.	8	.	.	.
Orchis pseudosambucina	10	15	29	13	.	.	.	.	.	.	.
Prunella vulgaris	.	23	6	.	.	.	.	.	.	50	15
Pteridium aquilinum	.	46	6	.	.	.	.	25	63	.	.
Ranunculus ficaria	10	15	59	67	.	.	.	.	.	.	.
Rumex acetosa	90	77	29	27	.	.	.	.	.	.	.
Silene alba subsp. divaricata	10	23	41	27	.	.	.	.	.	.	.
Trifolium ochroleucum	.	.	35	13	.	.	.	42	.	.	5
Astragalus glycyphyllos	.	.	.	.	.	13	25	8	.	.	.
Lamium maculatum	.	15	18	20	.	.	.	.	.	.	.
Leopoldia comosa	.	.	.	.	67	75	.	.	.	8	.
Muscari botryoides	.	15	18	20	.	.	.	.	.	.	.
Opopanax chironium	.	.	24	7	.	25	.	.	.	.	.
Rhagadiolus stellatus	10	.	12	20	.	.	.	.	.	.	.
Tanacetum corymbosum	.	.	.	.	.	50	25	8	.	.	.
Thesium divaricatum	.	.	.	.	.	25	25	8	.	.	.
Vicia sativa	.	.	.	.	44	38	.	.	.	.	5
Viola pseudogracilis	.	15	24	7	.	.	.	.	.	.	.
Helianthemum nummularium	.	.	.	.	11	.	.	.	.	.	5
Achillea ligustica	.	.	.	.	.	.	.	33	20	.	.
Asphodeline liburnica	.	.	.	.	22	13	.	.	.	.	.
Cistus creticus susbsp. eriocephalus	.	.	.	.	.	25	.	.	.	25	.
Cynosurus echinatus	.	.	.	.	11	13	.	.	.	.	.
Elaeoselinum asclepium subsp. meoides	.	.	.	.	.	38	.	8	.	.	.
Galium album	.	.	.	.	.	13	.	.	90	.	.
Hypericum perforatum	.	.	.	.	.	13	.	.	.	42	.
Lathyrus sphaericus	.	.	.	.	56	25	.	.	.	.	.
Leontodon cichoraceus	.	.	.	.	22	25	.	.	.	.	.
Narcissus poeticus	.	85	24	.	.	.	.	.	.	.	.
Plantago lanceolata	.	.	.	.	11	.	.	.	.	17	.
Poa bulbosa	.	.	.	.	22	.	.	.	.	.	10
Poa trivialis	.	.	.	.	11	38	.	.	.	.	.
Ranunculus bulbosus	.	.	.	.	.	.	.	.	.	50	10
Sedum cepaea	.	.	.	.	11	.	.	.	.	8	.
Sedum tenuifolium	.	.	.	.	44	.	.	.	.	8	.
Solenanthus apenninus	.	.	18	20	.	.	.	.	.	.	.
Thymus longicaulis	.	.	.	.	33	25	.	.	.	.	.
Trifolium angustifolium	.	.	.	.	.	13	.	.	.	8	.
Viola suavis	.	.	.	.	.	.	.	.	.	25	5
Achillea collina	.	.	.	.	.	.	.	.	.	8	.
Achillea millefolium	.	.	.	.	.	.	.	.	.	.	5
Agrostis tenuis	.	.	.	.	.	.	.	.	.	17	.
Asphodelus microcarpus	.	.	.	.	.	.	.	.	.	8	.
Asplenium adiantum-nigrum	.	.	.	.	.	.	.	.	.	.	20
Astragalus monspessulanus	.	.	.	.	.	25	.	.	.	.	.
Bellis sylvestris	.	.	.	.	.	.	.	.	.	25	.
Briza maxima	.	.	.	.	.	.	.	.	.	8	.
Bromus caprinus	.	.	.	.	.	38	.	.	.	.	.
Campanula rapunculoides	.	.	.	.	11	.	.	.	.	.	.
Campanula rapunculus	.	.	.	.	.	.	.	.	.	25	.
Carlina corymbosa	.	.	.	.	.	25	.	.	.	.	.
Centaurium erythraea	.	.	.	.	.	.	.	.	.	8	.
Chaerophyllum hirsutum	.	.	.	.	.	13	.	.	.	.	.
Cirsium vulgare	.	.	.	.	.	.	.	.	17	.	.
Coronilla varia	.	.	.	.	.	.	25	.	.	.	.
Cynosurus cristatus	.	.	.	.	.	.	.	.	.	8	.
Cynosurus elegans	.	.	.	.	.	.	.	.	.	17	.
Dactylis hispanica	.	.	.	.	.	.	.	.	.	25	.
Dianthus balbisii	.	.	.	.	.	.	.	.	.	8	.
Doronicum columnae	.	.	.	.	11	.	.	.	.	.	.
Dorycnium pentaphyllum	.	.	.	.	.	.	.	.	.	.	25
Epipactis atrorubens	.	.	.	.	.	.	25	.	.	.	.
Euphorbia falcata	.	.	.	.	.	.	.	.	.	17	.
Euphorbia flavicoma	.	.	.	.	.	25	.	.	.	.	.
Fragaria viridis	.	.	.	.	.	.	.	.	.	8	.
Galium aetnensis	.	.	.	.	.	.	.	.	.	58	.
Gastridium ventricosum	.	.	.	.	.	.	.	.	.	25	.
Geranium dissectum	.	.	.	.	.	13	.	.	.	.	.
Geranium purpureum	.	.	.	.	.	.	.	.	.	17	.
Gymnadenia conopsea	.	.	.	.	11	.	.	.	.	.	.
Hieracium bauhinii	.	.	.	.	.	25	.	.	.	.	.
Hieracium crinitum	.	.	.	.	11	.	.	.	.	.	.
Hieracium sp.	.	.	.	.	.	.	.	.	.	.	40
Hippocrepis comosa	.	.	.	.	.	13	.	.	.	.	.

Holcus lanatus	.	.	.	.	.	.	.	.	.	.	5
Iris collina	.	.	.	.	.	50	.	.	.	.	.
Knautia calycina	.	.	.	.	.	.	.	.	.	75	.
Lamium album	.	.	.	.	.	.	.	.	.	8	.
Lamium bifidum	40	.	.	.	.	.	.	.	.	.	.
Lathyrus odoratus	.	.	.	.	.	13	.	.	.	.	.
Leontodon crispus	.	.	.	.	.	13	.	.	.	.	.
Leontodon sp.	.	.	.	.	.	.	.	.	.	8	.
Loranthus europaeus	.	.	.	.	.	.	.	.	23	.	.
Lotus ornithopodioides	.	.	.	.	.	13	.	.	.	.	.
Lupinus micranthus	.	.	.	.	.	13	.	.	.	.	.
Luzula campestris	.	.	.	.	.	.	.	.	.	.	5
Luzula multiflora	.	.	.	.	11	.	.	.	.	.	.
Malus domestica	.	.	.	.	11	.	.	.	.	.	.
Medicago lupulina	.	.	.	.	.	13	.	.	.	.	.
Micromeria graeca	.	.	.	.	.	13	.	.	.	.	.
Micromeria juliana	.	.	.	.	.	.	.	.	.	17	.
Myosotis arvensis	.	.	.	.	.	13	.	.	.	.	.
Narcissus tazetta	.	.	.	.	.	.	.	.	10	.	.
Onosma echioides	.	.	.	.	.	13	.	.	.	.	.
Orchis tridentata	.	.	.	.	.	13	.	.	.	.	.
Origanum vulgare	.	.	.	.	.	.	.	.	.	33	.
Ornithopus compressus	.	.	.	.	.	13	.	.	.	.	.
Petrorhagia saxifraga	.	.	.	.	.	13	.	.	.	.	.
Peucedanum officinale	.	.	.	.	.	13	.	.	.	.	.
Phleum ambiguuum	.	.	.	.	.	13	.	.	.	.	.
Phleum bertolonii	.	.	.	.	.	.	.	17	.	.	.
Phleum pratense	.	.	.	.	22	.	.	.	.	.	.
Phlomis herba-venti	.	.	.	.	.	13	.	.	.	.	.
Pimpinella peregrina	.	.	.	.	.	.	.	.	.	17	.
Poa compressa	.	.	.	.	11	.	.	.	.	.	.
Polygala major	.	.	.	.	.	25	.	.	.	.	.
Polygala nicaeensis	.	.	.	.	.	13	.	.	.	.	.
Psoralea bituminosa	.	.	.	.	.	13	.	.	.	.	.
Pyrus communis	.	.	.	.	.	.	.	.	.	.	10
Reichardia picroides	.	.	.	.	.	13	.	.	.	.	.
Salvia verbenaca	.	.	.	.	.	25	.	.	.	.	.
Sanguisorba minor	.	.	.	.	.	.	.	.	.	8	.
Scorzonera glastifolia	.	.	.	.	.	13	.	.	.	.	.
Selaginella denticulata	.	.	.	.	.	.	.	.	.	25	.
Serratula cichoracea	.	.	.	.	.	50	.	.	.	.	.
Stachys germanica	.	38	.	.	.	.	.	.	.	.	.
Teucrium montanum	.	.	.	.	.	.	.	.	.	.	5
Thalictrum minus	.	.	.	.	.	.	.	.	.	17	.
Trifolium campestre	.	.	.	.	.	.	.	.	.	8	.
Trifolium pratense subsp. semipurpureum	.	.	.	.	.	.	.	.	67	.	.
Urospermum dalechampii	.	.	.	.	11	.	.	.	.	.	.
Veronica officinalis	.	.	.	.	.	.	.	17	.	.	.
Vicia bithynica	.	.	.	.	.	13	.	.	.	.	.
Vicia cassubica	.	.	.	.	.	.	.	.	70	.	.
Vicia cracca	.	.	.	.	.	13	.	.	.	.	.
Vicia ochroleuca	.	.	.	.	.	.	.	.	.	33	.

Tab. 7 - Pino calabricae-Quercenion congestae

1 - Agropyro panormitani-Quercetum congestae
2 - Vicio cassubicae-Quercetum cerridis
3 - Festuco heterophyllae-Quercetum congestae
4 - Quercetum leptobalanae
5 - Arabido turritae-Quercetum congestae
6 - Vicio elegantis-Quercetum congestae
7 - Quercetum gussonei
8 - Erico arboreae-Quercetum congestae

c = characteristic; d = differential; t = transgressive

	N. column	1	2	3	4	5	6	7	8
	N. releves	23	6	7	17	5	5	9	4
	Pino calabricae-Quercenion congestae								
c	Quercus congesta	90	100	100	71	100	100	67	100
c	Quercus dalechampii	90	100	100	100	100	100	78	100
c	Scutellaria columnae subsp. gussonei	.	.	.	35	.	.	56	75
c	Pinus nigra subsp. calabrica	70	67	.	.	.	.	.	.
c	Rubus aetnicus	.	67	.	.	100	.	.	.
c	Symphytum gussonei	.	.	.	59	.	.	44	.
d	Hypochoeris laevigata	.	83	57	59	.	60	.	.
d	Conopodium capillifolium	50	.	100	.	.	.	22	.
d	Quercus fontanesii	.	.	.	.	.	.	67	.
d	Quercus gussonei	.	.	.	.	.	.	100	.
d	Quercus leptobalana	.	.	.	100	.	.	.	.
	Quercenion virgilianae								
c	Origanum heracleoticum	.	.	.	.	.	.	.	50
d	Rhamnus alaternus	.	50	29	.	40	60	.	.
	Pino calabricae-Quercion congestae								
c	Thalictrum calabricum	.	50	71	88	20	40	56	.
c	Paeonia mascula subsp. russii	.	.	.	59	.	60	78	.
c	Silene sicula	.	83	.	59	.	60	.	.
c	Agropyron panormitanum	90	.	.	.	.	.	.	.
c	Helleborus bocconei subsp. intermedius	.	.	.	.	.	.	.	25
c	Myosotis sylvatica subsp. elongata	.	.	.	6	.	.	.	.
d	Carex distachya	50	100	100	71	100	.	100	25
d	Calicotome infesta	.	.	.	59	100	100	44	.
d	Achillea ligustica	.	.	.	35	60	80	.	.
d	Allium siculum	.	.	.	35	.	.	33	.
d	Centaurea parlatoris	.	.	43	.	20	.	.	.
d	Allium paniculatum	.	.	57	.	.	.	.	.
d	Betula aetnensis	.	50	.	.	.	.	.	.
t	Clinopodium vulgare subsp. arundanum	.	.	.	76	60	60	100	50
	Carpinion orientalis								
	Asparagus acutifolius	.	50	86	100	60	80	78	.
	Cnidium silaifolium	50	.	71	.	.	.	56	.
	Arabis turrita	.	.	.	.	100	.	.	25
	Cyclamen repandum	.	.	.	71	.	.	.	.
	Teucrio siculi-Quercion cerridis								
	Crepis leontodontoides	90	100	71	76	100	100	89	.
	Cytisus villosus	.	50	43	65	100	100	89	100
	Teucrium siculum	.	50	100	76	80	80	78	100
	Erica arborea	.	.	.	47	40	.	67	100
	Silene viridiflora	.	50	.	.	.	.	33	75
	Melittis albida	.	.	.	59	.	.	67	.
	Echinops siculus	.	.	.	76	.	.	67	.
	Paeonia mascula	.	.	43	.	.	.	.	.
	Digitalis micrantha	.	.	.	.	.	.	.	50
	Iris foetidissima	.	.	.	.	.	.	56	.
	Quercetalia pubescenti-petraeae								
	Lonicera etrusca	.	100	71	53	60	80	89	.
	Ranunculus neapolitanus	.	.	43	29	60	60	67	.
	Aristolochia lutea	.	.	43	.	100	.	33	50
	Fraxinus ornus	.	33	.	35	80	.	33	.
	Viola alba subsp. dehnhardtii	.	.	.	94	.	60	100	25
	Pulicaria odora	.	.	.	59	.	.	89	25
	Agrimonia eupatoria	.	.	.	35	.	.	89	50
	Oenanthe pimpinelloides	.	.	.	100	.	.	100	.
	Buglossoides purpurocaerulea	.	.	.	65	.	.	44	.
	Limodorum abortivum	30	.	.	6	.	.	.	.
	Melica arrecta	.	.	43	59	.	.	.	.
	Quercus cerris	.	100	.	.	.	.	100	.
	Acer monspessulanum	.	.	.	12	.	.	.	.
	Arum italicum	.	.	.	.	.	.	22	.
	Epipactis microphylla	30	.	.	.	.	.	.	.

Hypericum perfoliatum	.	.	.	.	40	.	.	.
Silene italica subsp. italica	.	.	.	.	.	.	44	.
Sorbus domestica	.	.	.	.	.	.	.	25
Fagetalia sylvaticae								
Galium rotundifolium	50	.	.	.	.	.	.	25
Doronicum orientale	50	.	.	.	.	.	.	.
Geranium robertianum	.	.	.	.	.	.	.	50
Geranium versicolor	.	.	.	.	.	.	.	25
Lamium flexuosum	.	.	.	6	.	.	.	.
Luzula sieberi subsp. sicula	50	.	.	.	.	.	.	.
Milium effusum	10	.	.	.	.	.	.	.
Vinca minor	.	.	.	.	.	.	.	50
Populetalia albae								
Rumex sanguineus	.	.	.	.	.	.	.	75
Querco-Fagetea								
Brachypodium sylvaticum	90	.	100	94	100	100	89	100
Luzula forsteri	.	67	86	88	80	80	67	25
Poa sylvicola	70	.	.	71	80	100	100	100
Festuca exaltata	.	50	71	94	40	60	100	.
Hedera helix	.	.	100	94	80	60	100	25
Ruscus aculeatus	.	.	71	94	40	100	100	25
Castanea sativa	30	.	.	.	40	60	.	100
Cyclamen hederifolium	.	.	71	24	80	.	56	.
Epipactis helleborine	.	.	.	29	.	.	22	75
Daphne laureola	90	.	.	.	20	.	89	.
Festuca heterophylla	70	.	100	.	.	.	.	100
Geum urbanum	.	.	.	29	.	.	56	75
Lathyrus venetus	50	.	.	24	.	.	22	.
Tamus communis	.	.	.	47	.	.	56	50
Ranunculus lanuginosus	.	.	.	12	.	.	67	.
Acer campestre	.	.	.	94	.	.	33	.
Aremonia agrimonoides	10	.	.	.	.	.	.	50
Clematis vitalba	.	.	.	35	.	.	22	.
Euphorbia amygdaloides subsp. arbuscula	.	.	.	53	.	.	78	.
Silene latifolia	.	.	.	.	60	.	56	.
Viola riviniana+reichenbachiana	50	.	.	.	.	.	.	100
Aristolochia rotunda	.	.	.	6	.	.	.	.
Polypodium gr. vulgare	.	.	.	.	40	.	.	.
Malus sylvestris	.	.	.	41	.	.	.	.
Anemone apennina	.	.	.	6	.	.	.	.
Chaerophyllum temulentum	.	.	.	.	.	.	11	.
Fragaria vesca	.	.	.	.	.	.	.	75
Ilex aquifolium	.	.	.	.	.	.	.	50
Mycelis muralis	.	.	.	.	.	.	.	25
Primula vulgaris	.	.	.	.	.	.	22	.
Pulmonaria apennina	.	.	.	.	.	.	.	25
Rhamno-Prunetea								
Crataegus monogyna	.	.	57	94	.	60	89	50
Rubus ulmifolius	.	.	57	100	.	100	100	100
Prunus spinosa	.	.	71	100	.	60	100	.
Pyrus amygdaliformis	.	.	.	59	60	60	22	.
Euphorbia characias	.	.	57	29	60	.	.	.
Spartium junceum	.	.	.	.	20	80	.	.
Euonymus europaeus	.	.	.	12	.	.	11	.
Genista aetnensis	.	83	.	.	20	.	.	.
Osyris alba	.	.	.	.	.	60	.	.
Crataegus laevigata	.	.	.	24	.	.	.	.
Rosa canina	.	.	.	59	.	.	.	.
Quercetea ilicis								
Rosa sempervirens	.	.	71	100	40	80	89	.
Rubia peregrina	.	.	43	88	60	80	67	.
Asplenium onopteris	.	67	86	47	100	.	67	.
Quercus ilex	.	.	86	94	100	.	.	100
Allium subhirsutum	.	.	.	59	.	.	44	.
Lonicera implexa	.	.	.	18	.	60	.	.
Smilax aspera	.	.	.	29	40	.	.	.
Phillyrea latifolia	.	.	.	6	.	.	.	.
Arbutus unedo	.	.	.	18	.	.	.	.
Daphne gnidium	.	.	.	24	.	.	.	.
Quercus suber	.	.	.	.	.	.	78	.
Other species								
Anthoxanthum odoratum	.	83	86	18	60	60	56	50
Dactylis glomerata	.	50	71	82	20	80	100	50
Pimpinella anysoides	.	.	100	47	100	100	67	.
Daucus carota	.	83	43	18	100	60	.	.
Pteridium aquilinum	.	100	100	.	80	.	78	100
Asphodelus microcarpus	.	50	.	59	60	.	44	.
Sedum tenuifolium	.	50	.	18	60	40	.	.
Silene vulgaris	.	.	57	12	80	.	33	.
Tolpis virgata	.	.	.	41	40	60	78	.
Trifolium pratense	.	.	.	65	20	40	33	.
Lathyrus pratensis	90	83	.	6	.	.	.	.

Bellis perennis	.	.	.	12	60	.	33	.
Briza maxima	.	.	.	12	20	.	22	.
Carlina corymbosa	.	.	57	.	60	60	.	.
Festuca circumediterranea	.	100	57	.	40	.	.	.
Geranium purpureum	.	.	.	.	60	100	11	.
Lolium perenne	.	.	.	24	40	.	44	.
Micromeria graeca	.	.	57	12	60	.	.	.
Origanum vulgare	.	.	43	35	.	.	89	.
Thapsia garganica	.	50	43	12	.	.	.	.
Trifolium ochroleucum	.	.	43	47	.	.	67	.
Asperula laevigata	.	.	.	94	.	.	89	.
Allium sardoum	.	.	43	.	.	20	.	.
Asplenium trichomanes	.	.	43	.	60	.	.	.
Carex flacca subsp. serrulata	.	.	.	71	.	80	.	.
Cistus salvifolius	.	.	.	18	.	80	.	.
Cynosurus cristatus	.	.	.	71	.	40	.	.
Hypericum perforatum	.	.	.	.	80	40	.	.
Prunella vulgaris	.	.	.	29	.	.	11	.
Secale strictum	.	83	57	.	.	.	.	.
Smyrnium rotundifolium	.	.	.	.	20	.	33	.
Teucrium chamaedrys	.	.	100	.	60	.	.	.
Torilis arvensis	.	.	.	18	.	.	11	.
Allium vineale	.	.	.	.	20	.	.	.
Anthemis arvensis subsp. sphacelata	.	83	.	.	.	.	.	.
Carduus nutans	.	.	.	.	80	.	.	.
Centaurium erythraea	.	.	.	41	.	.	.	.
Centaurium tenuiflorum	.	.	.	.	.	60	.	.
Clinopodium vulgare	.	.	100	.	.	.	.	.
Cynosurus echinatus	.	.	.	12	.	.	.	.
Festuca rubra	.	.	.	.	.	.	11	.
Galium album	.	.	.	.	.	.	.	75
Galium verum subsp. verum	.	.	.	.	.	.	44	.
Holcus lanatus	.	.	.	.	.	.	.	50
Juniperus haemisphaerica	.	67	.	.	.	.	.	.
Lamium bifidum	.	.	.	.	.	.	22	.
Linaria purpurea	.	.	.	.	20	.	.	.
Lytrum junceum	.	.	.	6	.	.	.	.
Pimpinella peregrina	.	.	29	.	.	.	.	.
Poa bulbosa	.	.	.	.	.	60	.	.
Potentilla detommasii	.	.	57	.	.	.	.	.
Scabiosa atropurpurea	.	.	.	18	.	.	.	.
Stachys germanica	.	.	.	12	.	.	.	.
Trifolium bivonae	.	.	.	12	.	.	.	.
Umbilicus rupestris	.	.	.	.	40	.	.	.
Urospermum dalechampii	.	.	.	29	.	.	.	.
Urospermum picroides	.	.	.	6	.	.	.	.
Vicia cassubica	.	83	.	.	.	.	.	.
Vicia sativa	.	.	.	.	.	40	.	.
Vicia tenuifolia	.	.	.	.	.	100	.	.
Vicia villosa	.	.	.	.	.	.	22	.

Tab. 8 - Quercenion virgilianae

1 - Sorbo torminalis-Quercetum virgilianae
2 - Celtido australis-Quercetum virgilianae
3 - Mespilo germanicae-Quercetum virgilianae
4 - Erico arboreae-Quercetum virgilianae
5 - Lauro nobilis-Quercetum virgilianae
6 - Aceri monspessulani-Quercetum virgilianae
7 - Oleo-Quercetum virgilianae

c = characteristic; d = differential; t = transgressive

	N. column	1	2	3	4	5	6	7
	N. releves	10	8	13	8	16	4	9
	Quercenion virgilianae							
c	Acanthus mollis	.	.	23	.	.	100	50
c	Clematis cirrhosa	.	.	15	.	43	50	.
c	Quercus virgiliana	.	.	.	.	100	100	100
c	Origanum heracleoticum	70	.	.	.	.	25	.
d	Olea europaea var. sylvestris	.	50	.	.	.	25	100
d	Pistacia lentiscus	.	.	15	.	.	50	83
d	Rhamnus alaternus	.	50	54	.	.	.	50
	Pino-Quercenion congestae							
c	Quercus dalechampii	.	.	.	100	.	.	.
d	Hypochoeris laevigata	40	.	15	.	.	.	.
	Pino-Quercion congestae							
c	Quercus amplifolia	.	.	.	.	81	50	50
c	Paeonia mascula subsp. russii	90	.	15	.	.	.	.
c	Scutellaria columnae subsp. gussonei	.	.	15	50	.	.	.
c	Silene sicula	100	25	.	.	.	.	.
c	Agropyron panormitanum	.	.	.	.	6	.	.
c	Helleborus bocconei subsp. intermedius	.	.	.	.	.	50	.
c	Rubus aetnicus	.	25	.	.	.	.	.
c	Thalictrum calabricum	100	.	.	.	.	.	.
d	Carex distachya	30	100	77	88	31	25	100
d	Achillea ligustica	.	.	46	38	6	.	.
d	Calicotome infesta	.	.	62	38	.	.	83
d	Allium paniculatum	.	25	15	.	.	.	.
d	Aristolochia clusii	70	.	.	.	.	.	.
t	Clinopodium vulgare subsp. arundanum	80	.	85	75	12	.	.
t	Celtis australis	.	50	.	.	.	25	.
	Carpinion orientalis							
	Asparagus acutifolius	.	100	100	100	68	100	100
	Cyclamen repandum	.	.	31	50	81	100	66
	Pistacia terebinthus	.	88	.	.	.	100	66
	Cnidium silaifolium	100	.	.	25	.	.	.
	Laurus nobilis	.	.	.	.	100	.	.
	Arabis turrita	.	.	.	.	.	50	.
	Teucrio siculi-Quercion cerridis							
	Crepis leontodontoides	30	75	77	100	.	.	.
	Cytisus villosus	.	.	62	100	.	.	.
	Teucrium siculum	.	.	92	63	.	.	.
	Erica arborea	.	.	.	100	.	.	.
	Paeonia mascula	.	50	.	.	.	.	.
	Physospermum verticillatum	100	.	.	.	.	.	.
	Quercetalia pubescenti-petraeae							
	Dryopteris pallida	.	25	31	.	68	75	.
	Lonicera etrusca	90	88	77	.	6	.	.
	Quercus pubescens	100	100	100	100	.	.	.
	Ranunculus neapolitanus	10	.	69	100	.	25	.
	Viola alba subsp. dehnhardtii	20	.	69	100	50	.	.
	Pulicaria odora	.	.	46	100	6	.	.
	Arum italicum	.	.	.	25	56	50	.
	Fraxinus ornus	40	.	23	.	25	.	.
	Melica arrecta	.	.	31	75	.	.	.
	Sorbus domestica	.	.	.	.	6	25	.
	Acer monspessulanum	.	.	.	.	.	100	.
	Huetia cynapioides	90	.	.	.	.	.	.
	Oenanthe pimpinelloides	.	.	.	63	.	.	.
	Agrimonia eupatoria	.	.	.	.	25	.	.
	Buglossoides purpurocaerulea	20	.	.	.	.	.	.
	Silene italica subsp. italica	.	.	23	.	.	.	.
	Sorbus torminalis	100	.	.	.	.	.	.
	Fagetalia sylvaticae							
	Doronicum orientale	.	.	.	88	56	.	.
	Lamium flexuosum	.	.	.	.	87	50	.
	Anthriscus nemorosa	50	.	.	.	.	.	.
	Geranium robertianum	.	.	.	.	.	25	.
	Polysticum aculeatum	.	.	8	.	.	.	.
	Sorbus aucuparia	10	.	.	.	.	.	.
	Populetalia albae							
	Populus alba	.	.	.	.	12	.	.
	Querco-Fagetea							
	Hedera helix	50	63	62	38	100	100	66
	Ruscus aculeatus	70	50	92	100	93	100	83
	Brachypodium sylvaticum	100	.	69	63	62	75	50
	Cyclamen hederifolium	30	.	100	100	100	100	.
	Tamus communis	80	.	31	50	43	50	.
	Clematis vitalba	60	.	38	.	43	75	.
	Aristolochia rotunda	.	50	.	.	.	25	.
	Poa sylvicola	100	.	92	.	.	.	.
	Festuca exaltata	30	.	.	100	.	.	.
	Geum urbanum	.	.	15	.	25	.	.
	Silene latifolia	.	50	.	63	.	.	.
	Polypodium gr. vulgare	.	75	31	.	.	.	.
	Ulmus minor	.	.	.	.	56	.	66
	Mespilus germanica	.	.	.	.	18	.	.
	Acer campestre	100	.	.	.	.	.	.
	Castanea sativa	.	.	.	.	6	.	.
	Corylus avellana	.	.	.	.	6	.	.
	Daphne laureola	70	.	.	.	.	.	.
	Euphorbia amygdaloides subsp. arbuscula	30	.	.	.	.	.	.
	Galanthus nivalis	.	.	.	.	12	.	.
	Luzula forsteri	.	.	.	100	.	.	.
	Prunus avium	.	.	.	.	18	.	.
	Rubus hirtus	100	.	.	.	.	.	.
	Rhamno-Prunetea							
	Rubus ulmifolius	.	75	77	100	93	100	100
	Crataegus monogyna	.	75	85	38	56	25	.
	Euphorbia characias	.	100	46	.	.	100	100
	Prunus spinosa	50	.	92	.	37	.	100
	Osyris alba	.	.	77	.	18	.	100
	Spartium junceum	.	63	.	.	.	.	83
	Rosa canina	.	.	54	.	37	.	.
	Coronilla emerus	.	.	.	.	18	.	.
	Euonymus europaeus	.	.	.	.	6	.	.
	Pyrus amygdaliformis	.	.	.	.	.	.	83
	Rhus coriaria	.	.	8	.	.	.	.
	Sambucus nigra	.	.	.	.	6	.	.
	Quercetea ilicis							
	Rosa sempervirens	70	63	85	50	68	.	100
	Rubia peregrina	30	100	100	100	87	.	100
	Quercus ilex	100	75	85	38	18	100	.
	Smilax aspera	.	.	77	88	6	100	100
	Arisarum vulgare	.	.	.	88	6	25	100
	Lonicera implexa	.	50	31	.	6	.	50
	Allium subhirsutum	80	.	85	38	.	.	.
	Ampelodesmos mauritanicus	.	.	.	88	.	25	83
	Asplenium onopteris	.	38	77	100	.	.	.
	Euphorbia dendroides	.	.	.	.	.	100	83
	Phillyrea latifolia	.	.	.	.	.	25	.
	Arbutus unedo	.	.	.	88	.	.	.
	Daphne gnidium	.	.	.	38	.	.	.
	Prasium majus	.	.	.	.	.	25	.
	Quercus suber	.	.	.	25	.	.	.
	Anagyris foetida	.	.	.	.	.	50	.
	Other species							
	Pteridium aquilinum	.	25	23	88	6	.	.
	Teucrium flavum	80	.	.	.	6	25	50
	Briza maxima	.	13	.	38	.	.	33
	Dactylis glomerata	.	100	69	88	.	.	.
	Daucus carota	.	88	77	.	.	.	33
	Geranium purpureum	.	38	.	75	68	.	.
	Anthoxanthum odoratum	.	38	.	63	.	.	.

Asphodelus microcarpus	.	.	31	50	.	.	.
Ballota rupestris	.	50	.	.	.	100	.
Stipa bromoides	.	.	8	.	.	50	.
Bituminaria bituminosa	.	.	.	.	.	50	100
Calamintha nepeta	.	13	8	.	.	.	.
Calystegia sylvatica	.	.	.	.	6	50	.
Galium lucidum	70	.	31	.	.	.	.
Hypericum perforatum	.	50	31	.	.	.	.
Micromeria graeca	.	75	23	.	.	.	.
Origanum vulgare	.	.	15	38	.	.	.
Oryzopsis miliacea	.	.	8	.	.	.	100
Pimpinella peregrina	.	.	31	75	.	.	.
Smyrnium rotundifolium	.	63	31	.	.	.	.
Vicia villosa	.	75	.	50	.	.	.
Pimpinella anysoides	.	50	.	.	.	.	.
Agropyron caninum	70	.	.	.	.	.	.
Allium triquetrum	.	.	.	25	.	.	.
Allium vineale	.	50	.	.	.	.	.
Asparagus albus	.	.	.	.	.	.	66
Asplenium trichomanes	.	38	.	.	.	.	.
Bellis perennis	.	.	.	.	43	.	.
Brachypodium ramosum	.	.	15	.	.	.	.
Carex flacca	.	.	.	.	.	.	83
Carex flacca subsp. serrulata	.	.	31	.	.	.	.
Carlina sicula	.	.	8	.	.	.	.
Carlina vulgaris	.	50	.	.	.	.	.
Cistus salvifolius	.	.	15	.	.	.	.
Euphorbia ceratocarpa	.	.	15	.	.	.	.
Geranium lucidum	.	.	.	.	43	.	.
Helictotrichon convolutuum	70	.	.	.	.	.	.
Hordeum bulbosum	.	.	15	.	.	.	.
Lathyrus aphaca	.	.	8	.	.	.	.
Leontodon hispidus subsp. siculus	70	.	.	.	.	.	.
Lolium perenne	30	.	.	.	.	.	.
Loranthus europaeus	.	.	.	.	.	25	.
Melica ciliata	.	.	.	.	.	25	.
Opopanax chironium	80	.	.	.	.	.	.
Orobanche hederae	.	.	.	.	6	.	.
Parietaria judaica	.	.	.	.	.	25	.
Pisum sativum	.	.	15	.	.	.	.
Plantago lanceolata	.	.	15	.	.	.	.
Polypodium cambricum	.	.	.	.	.	50	.
Ranunculus ficaria	.	.	.	.	43	.	.
Rumex acetosa	.	.	31	.	.	.	.
Rumex nebroides	30	.	.	.	.	.	.
Salix pedicellata	.	.	.	.	6	.	.
Sanguisorba minor	.	.	23	.	.	.	.
Sedum tenuifolium	.	25	.	.	.	.	.
Selaginella denticulata	.	.	.	63	.	.	.
Sesleria nitida	30	.	.	.	.	.	.
Silene vulgaris	60	.	.	.	.	.	.
Smyrnium olosatrum	.	.	.	.	.	25	.
Stachys germanica	.	.	8	.	.	.	.
Stembergia lutea	.	.	.	.	.	25	.
Teline monspessulana	.	.	.	50	.	.	.
Torilis arvensis	.	.	.	25	.	.	.
Trifolium campestre	.	.	.	25	.	.	.
Trifolium ochroleucum	30	.	.	.	.	.	.

Tab. 9 - Erythronio dens-canis - Quercion petraeae

1 - Asphodelo albi-Castanetum sativae
2 - Serratulo tinctoriae-Quercetum petraeae
3 - Frangulo-Quercetum petraeae
4 - Dactylorhizo maculatae-Quercetum petraeae
5 - Lathyro montani-Quercetum cerridis
6 - Digitali australis-Castanetum sativae
7 - Fago-Quercetum cerridis
8 - Symphyto tuberosi-Castanetum sativae
9 - Allio pendulini-Quercetum cerris
10 - Physospermo-Quercetum petraeae

c = characteristic; d = differential; t = transgressive

	N. column	1	2	3	4	5	6	7	8	9	10
	N. releves	5	16	18	8	26	18	7	16	10	6
	Erythronio dens canis-Quercion petraeae										
c	Physospermum cornubiense	50	94	39	70	62	5	43	31	60	100
c	Genista germanica	.	13	.	10	27	.	14	6	30	17
c	Lathyrus montanus	.	.	.	90	50	17	29	25	50	100
c	Helleborus viridis	.	31	.	30	.	.	14	.	20	.
c	Polygonatum odoratum	.	.	.	30	12	.	.	6	.	67
c	Luzula pedemontana	.	.	.	70	31	.	.	.	.	17
c	Erythronium dens canis	.	25	.	.	.	.	.	.	.	83
c	Helleborus odorus subsp. laxus	30	.	.	.	.	.	.	.	.	.
d	Teucrium scorodonia	90	.	39	30	42	61	71	38	20	33
d	Genista pilosa	.	.	.	30	42	.	14	6	.	67
d	Deschampsia flexuosa	.	.	.	50	.	5	.	6	.	83
d	Pinus sylvestris	90	25	6	.	.	.	.	.	.	.
d	Phyteuma michelii	.	.	.	90	.	.	.	.	.	50
d	Iris graminea	.	69	.	.	.	.	.	.	.	.
t	Quercus petraea	.	50	100	50	38	5	43	.	30	100
t	Anemone nemorosa	.	44	39	.	15	5	43	61	80	.
t	Platanthera clorantha	30	38	.	30	.	.	43	12	20	.
t	Luzula sylvatica	70	.	.	10	.	17	.	12	.	50
t	Populus tremula	90	.	6	.	.	.	14	12	10	.
t	Dactylorhiza maculata	10	.	.	50	.	.	14	25	.	.
t	Anemone trifolia	.	.	.	90	42	.	.	.	.	83
t	Listera ovata	10	.	.	10	.	.	.	6	.	.
	Teucrio siculi-Quercion cerridis										
	Erica arborea	70	.	17	30	27	28	14	31	.	67
	Cytisus villosus	.	.	11	.	15	.	.	.	10	.
	Lychnis flos-cuculi	.	.	.	.	.	5	14	.	30	.
	Carex sylvatica	.	.	.	.	.	.	29	.	30	.
	Crepis leontodontoides	.	.	.	.	.	.	14	6	.	.
	Digitalis micrantha	.	.	.	.	.	.	.	.	20	.
	Malus florentina	.	.	.	.	.	.	.	6	.	.
	Carpinion orientalis										
	Ostrya carpinifolia	.	38	.	50	46	44	14	12	10	.
	Digitalis lutea	30	.	.	.	.	83	29	25	.	.
	Lilium bulbiferum subsp. croceum	.	.	.	10	.	.	.	25	.	17
	Cyclamen repandum	.	.	.	.	.	.	14	31	50	.
	Melampyrum italicum	.	.	.	.	.	5	.	.	20	.
	Sanicula europaea	.	.	.	.	.	11	.	12	.	.
	Buphtalmum salicifolium	.	.	.	.	23	.	.	.	.	50
	Luzula nivea	.	.	.	30	.	5	.	.	.	.
	Laurus nobilis	.	.	11	.	.	.	.	6	.	.
	Viburnum tinus	.	.	.	.	.	5	.	6	.	.
	Chamaecytisus hirsutus	.	31	.	.	.	.	.	.	.	17
	Cytisus sessilifolius	.	19	.	.	31	.	.	.	.	.
	Acer obtusatum	.	.	.	.	.	5	.	12	.	.
	Laburnum anagyroides	.	.	.	.	19	.	.	.	.	.
	Campanula medium	.	.	.	.	38	.	.	.	.	.
	Knautia drymeia	30	.	.	.	.	.	.	.	.	.
	Melampyrum cristatum	.	25	.	.	.	.	.	.	.	.
	Peucedanum cervaria	.	19	.	.	.	.	.	.	.	.
	Sesleria autumnalis	.	.	.	.	38	.	.	.	.	.
	Campanula persicifolia	.	.	.	.	4	.	.	.	.	.
	Asparagus acutifolius	.	.	.	.	.	.	.	12	.	.
	Carpinus orientalis	.	.	.	.	.	.	.	.	80	.
	Inula salicina	.	.	.	.	.	.	.	.	30	.
	Quercetalia pubescenti-petraeae										
	Brachypodium rupestre	30	13	17	90	69	33	14	12	50	100
	Fraxinus ornus	.	94	83	90	69	44	71	44	60	83
	Quercus cerris	10	100	72	70	100	50	71	31	90	.
	Quercus pubescens	90	94	6	30	38	28	.	19	70	33
	Sorbus torminalis	30	100	83	.	4	5	57	25	30	67
	Stachys officinalis	70	75	.	70	.	11	57	25	80	83
	Sorbus domestica	.	69	33	.	4	17	71	6	60	.

Viola alba subsp. dehnhardtii	30	75	17	.	.	61	14	38	80	.
Lathyrus niger	.	100	.	30	.	5	.	6	50	50
Melittis melissophyllum	.	50	.	30	31	.	.	12	50	33
Cornus mas	.	63	.	30	15	17	.	31	40	.
Serratula tinctoria	.	81	11	10	.	.	29	.	30	33
Erica scoparia	.	.	17	.	.	39	43	6	60	.
Oenanthe pimpinelloides	.	19	.	.	.	22	14	31	30	.
Hypericum montanum	.	.	.	30	81	39	.	6	.	.
Asparagus tenuifolius	.	38	11	.	.	.	.	12	10	.
Acer opulifolium	.	25	.	.	54	.	.	.	.	17
Buglossoides purpurocaerulea	.	38	.	.	35	.	.	.	20	.
Silene italica subsp. italica	.	.	.	.	.	22	.	12	20	.
Acer monspessulanum	.	.	.	.	12	5	.	.	.	.
Aristolochia lutea	.	.	.	.	38	.	.	.	40	.
Lonicera etrusca	.	.	56	.	.	11	.	.	.	.
Sorbus aria	.	.	.	.	42	.	.	.	.	.
Epipactis microphylla	.	.	.	.	.	5	.	.	.	.
Scutellaria columnae	.	.	.	.	.	5	.	.	.	.
Arum italicum	.	.	.	.	.	.	.	6	.	.
Limodorum abortivum	.	.	.	.	.	.	.	6	.	.
Peucedanum oroselinum	.	.	.	.	.	.	.	.	.	17
Fagetalia sylvaticae										
Poa nemoralis	.	.	.	30	27	28	71	25	60	17
Euphorbia dulcis	.	.	.	90	19	.	29	31	10	100
Fagus sylvatica	.	25	.	10	12	.	71	12	30	.
Geranium nodosum	.	.	.	30	27	5	14	6	20	.
Salvia glutinosa	50	.	.	.	23	67	.	12	.	.
Acer pseudoplatanus	.	.	6	.	.	5	.	12	.	.
Geranium robertianum	.	.	.	.	15	11	.	25	.	.
Luzula pilosa	.	.	6	.	.	.	29	.	10	.
Scrophularia nodosa	.	.	.	10	.	5	.	6	.	.
Vicia sepium	.	.	.	.	.	5	.	6	10	.
Abies alba	.	.	.	.	.	11	.	12	.	.
Arum maculatum	.	.	.	.	.	.	29	.	30	.
Mercurialis perennis	.	.	.	.	.	.	29	.	10	.
Ornithogalum pyrenaicum	.	.	.	30	.	.	.	6	.	.
Polygonatum multiflorum	.	.	11	.	.	.	.	6	.	.
Vinca minor	.	.	.	.	.	5	.	25	.	.
Veronica urticifolia	.	.	.	30	.	.	.	.	.	.
Cephalanthera rubra	.	.	.	.	31	.	.	.	.	.
Lathyrus vernus	.	.	.	.	15	.	.	.	.	.
Prenanthes purpurea	.	.	.	.	.	.	14	.	.	.
Tilia cordata	.	.	.	.	.	.	14	.	.	.
Scilla bifolia	.	.	.	.	.	.	.	19	.	.
Galium odoratum	.	.	.	.	.	.	.	6	.	.
Galium rotundifolium	.	.	.	.	.	.	.	6	.	.
Lamiastrum galeobdolon	.	.	.	.	.	.	.	6	.	.
Moehringia trinervia	.	.	.	.	.	.	.	6	.	.
Stellaria holostea	.	.	.	.	.	.	.	6	.	.
Quercetalia robori-petraeae										
Potentilla erecta	.	.	.	30	.	5	14	6	.	17
Viola canina	.	.	.	.	54	.	.	.	.	.
Holcus mollis	.	.	.	.	.	5	.	.	.	.
Calluna vulgaris	.	.	.	.	.	.	14	.	.	.
Blechnum spicant	.	.	.	.	.	.	.	.	10	.
Populetalia albae										
Frangula alnus	10	.	56	10	.	.	14	.	10	33
Alnus glutinosa	.	.	.	30	.	5	14	.	30	.
Symphytum bulbosum	.	.	.	.	19	.	.	.	.	.
Rumex sanguineus	.	.	.	.	.	5	.	.	.	.
Populus alba	.	.	.	.	.	.	.	6	.	.
Athyrium filix-foemina	.	.	.	.	.	.	.	.	10	.
Querco-Fagetea										
Castanea sativa	90	44	72	70	42	100	86	100	20	50
Viola riviniana+reichenbachiana	90	19	6	90	19	50	43	38	20	67
Corylus avellana	30	.	11	70	54	22	29	38	10	100
Cruciata glabra	70	63	17	90	38	50	29	56	90	.
Festuca heterophylla	50	.	39	90	23	83	86	88	80	67
Tamus communis	.	63	39	30	69	39	71	56	60	17
Acer campestre	.	38	17	30	69	11	29	44	70	.
Carpinus betulus	10	31	17	10	19	11	71	38	.	.
Hedera helix	30	.	72	.	31	67	86	69	50	17
Ilex aquifolium	.	.	94	30	19	5	14	12	20	33
Luzula forsteri	70	38	.	70	.	72	86	75	80	17
Prunus avium	30	50	39	50	.	33	.	50	20	33
Ruscus aculeatus	.	100	89	30	19	5	14	50	40	.
Solidago virgaurea	90	.	22	90	.	61	71	50	70	83
Brachypodium sylvaticum	30	.	39	.	35	55	57	56	60	.
Daphne laureola	30	.	.	30	15	39	14	38	20	.
Primula vulgaris	30	31	.	70	.	28	57	38	60	.
Symphytum tuberosum	.	81	6	10	8	.	43	72	70	.
Malus sylvestris	.	.	17	.	.	17	29	19	20	17
Campanula trachelium	.	.	.	30	.	39	29	38	20	17
Clematis vitalba	.	.	.	.	38	44	14	12	30	17
Fragaria vesca	.	13	.	10	.	33	43	38	50	.
Lathyrus venetus	.	.	.	10	15	11	29	44	20	.

Melica uniflora	.	.	11	.	31	39	71	56	50	.
Mespilus germanica	50	.	22	30	.	5	.	25	.	.
Carex digitata	70	.	.	70	.	5	14	.	.	33
Polypodium gr. vulgare	.	.	17	50	.	5	14	31	.	.
Cyclamen hederifolium	.	44	22	.	15	.	43	.	40	.
Lonicera caprifolium	.	81	.	.	.	17	14	44	60	.
Poa sylvicola	.	.	.	.	.	22	29	44	40	.
Ranunculus lanuginosus	.	.	.	.	.	28	29	38	50	.
Epipactis helleborine	.	.	.	10	.	33	.	44	10	.
Hepatica nobilis	.	44	.	10	27	.	.	.	.	50
Cephalanthera longifolia	.	.	.	30	23	.	14	.	.	33
Hieracium gr. murorum	.	.	.	.	.	67	29	50	50	.
Platanthera bifolia	.	.	17	.	.	11	.	6	.	33
Potentilla micrantha	.	13	.	70	58	.	.	.	.	33
Ranunculus nemorosus	.	.	.	30	.	5	.	19	.	17
Ajuga reptans	.	.	.	.	.	17	.	12	.	33
Allium pendulinum	.	.	.	.	.	.	43	19	30	.
Dryopteris filix-mas	.	.	.	.	23	5	.	12	.	.
Euphorbia amygdaloides	.	.	.	10	.	.	.	12	10	.
Hieracium sylvaticum	.	25	.	90	.	.	.	.	.	33
Lathyrus sylvestris	.	13	.	.	.	5	.	6	.	.
Mycelis muralis	.	.	.	.	.	22	14	25	.	.
Polystichum setiferum	.	.	.	.	.	11	14	12	.	.
Pulmonaria officinalis	.	.	.	10	19	.	14	.	.	.
Rubus hirtus	.	.	39	.	.	33	.	38	.	.
Ulmus minor	.	.	.	.	12	.	.	6	30	.
Aquilegia vulgaris	.	.	.	.	.	.	14	19	10	.
Hieracium racemosum	.	.	6	.	.	5	.	.	.	.
Aristolochia rotunda	.	.	.	30	.	.	.	.	20	.
Genista tinctoria	.	.	.	.	.	.	14	.	20	.
Helleborus bocconei subsp. bocconei	.	.	.	.	.	11	.	61	.	.
Bunium bulbocastanum	.	.	.	.	.	5	.	25	.	.
Geum urbanum	.	.	.	.	.	5	.	12	.	.
Hieracium sabaudum	.	38	.	.	.	.	.	.	.	33
Neottia nidus-avis	.	.	.	10	.	.	.	19	.	.
Quercus robur	.	.	6	.	.	.	.	19	.	.
Rosa arvensis	.	50	.	.	.	.	.	.	.	33
Silene nutans	.	.	.	10	.	.	.	.	.	33
Lonicera xylosteum	.	50	.	.	.	.	.	.	.	.
Pulmonaria apennina	.	19	.	.	.	.	.	.	.	.
Viola odorata	.	.	.	.	.	5	.	.	.	.
Lapsana communis	.	.	.	.	.	5	.	.	.	.
Cephalantera damasonium	.	.	.	.	.	5	.	.	.	.
Bromus ramosus	.	.	.	.	.	.	.	12	.	.
Anemone apennina	.	.	.	.	.	.	.	12	.	.
Cardamine bulbifera	.	.	.	.	.	.	.	6	.	.
Chaerophyllum temulentum	.	.	.	.	.	.	.	12	.	.
Thalictrum aquilegifolium	.	.	.	.	.	.	.	6	.	.
Crocus neapolitanus	.	.	.	.	.	.	.	.	.	67
Viola hirta	.	.	.	.	.	.	.	.	.	17
Aremonia agrimonoides	.	.	.	.	.	.	.	.	.	17
Rhamno-Prunetea and Cytisetea scopario-striati										
Crataegus monogyna	30	56	28	70	38	28	57	62	90	50
Juniperus communis	50	50	39	10	19	50	43	38	70	67
Rubus ulmifolius	10	.	44	50	.	22	86	12	60	33
Cornus sanguinea	10	31	.	.	46	17	14	25	70	.
Prunus spinosa	.	50	11	.	.	11	29	25	80	17
Cytisus scoparius	.	.	6	.	31	39	29	44	40	.
Pyrus pyraster	.	44	6	.	.	5	43	.	70	17
Coronilla emerus	.	25	.	30	54	28	.	6	.	.
Euonymus europaeus	.	.	11	.	.	11	14	44	50	.
Ligustrum vulgare	.	69	.	.	.	5	.	25	60	.
Rosa canina	.	63	.	.	.	22	.	12	40	.
Pyracantha coccinea	50	.	.	.	.	.	.	.	20	.
Rubus canescens	.	.	.	.	27	5	.	.	.	.
Viburnum lantana	.	75	.	.	35	.	.	.	.	.
Crataegus laevigata	.	75	.	.	.	.	.	.	.	.
Ulex europaeus	.	.	.	.	15	.	.	.	.	.
Rosa agrestis	.	.	.	.	.	5	.	.	.	.
Rubus idaeus	.	.	.	.	.	11	.	.	.	.
Sambucus nigra	.	.	.	.	.	.	.	12	.	.
Rosa gallica	.	.	.	.	.	.	.	.	30	.
Rhamnus catharticus	.	.	.	.	.	.	.	.	.	17
Quercetea ilicis										
Asplenium onopteris	.	.	6	.	.	22	14	38	20	.
Quercus ilex	.	.	39	.	12	.	57	25	30	.
Rubia peregrina	.	.	17	.	.	11	14	19	.	.
Arbutus unedo	.	.	50	.	.	.	.	6	10	.
Rosa sempervirens	.	.	.	.	.	5	.	.	30	.
Carex divulsa	.	.	.	.	.	5	.	.	.	.
Phillyrea latifolia	.	.	.	.	.	.	14	.	.	.
Other species										
Pteridium aquilinum	90	44	61	70	58	89	57	88	40	67
Carex flacca	30	56	6	10	.	11	43	.	60	17
Dactylis glomerata	.	.	6	30	.	28	29	19	30	33
Anthoxanthum odoratum	.	.	6	30	.	17	14	.	20	.
Astragalus glycyphyllos	.	.	.	.	12	5	14	25	10	.

Tanacetum corymbosum	.	63	.	30	23	.	.	6	.	50
Clinopodium vulgare	10	.	.	.	.	11	.	19	50	.
Veronica officinalis	.	.	.	.	27	17	.	6	10	.
Campanula rapunculus	.	.	.	30	.	17	.	6	.	.
Cruciata laevipes	.	.	.	.	.	11	14	6	.	.
Epilobium montanum	.	.	.	.	4	11	.	12	.	.
Galium verum subsp. verum	.	.	.	.	.	22	.	6	.	67
Molinia coerulea	.	75	.	10	.	.	.	.	.	17
Teucrium chamaedrys	.	.	.	.	8	5	.	.	10	.
Vicia cracca	.	.	.	.	.	.	14	6	40	.
Vincetoxicum hirundinaria	.	19	.	.	.	11	.	.	.	.
Asphodelus albus	90	.	.	.	.	.	.	.	.	33
Cardamine hirsuta	.	.	.	.	.	5	.	12	.	.
Cerastium sylvaticum	.	.	.	.	.	5	.	6	.	.
Conopodium majus	.	.	.	10	.	.	.	.	.	17
Dianthus seguieri	.	.	.	30	.	.	.	.	.	50
Filipendula vulgaris	.	.	.	.	.	.	.	6	20	.
Galium aristatum	.	.	.	10	.	.	.	.	.	17
Holcus lanatus	.	.	.	.	.	5	.	.	20	.
Molinia arundinacea	90	.	67	.	.	.	.	.	.	.
Pinus pinaster	.	.	94	.	12	.	.	.	.	.
Prunella vulgaris	.	.	.	.	.	11	.	6	.	.
Ranunculus bulbosus	.	.	.	.	.	5	.	12	.	.
Robinia pseudoacacia	.	.	17	.	.	.	.	12	.	.
Sedum cepaea	.	.	.	.	.	17	.	12	.	.
Senecio fuchsii	.	.	.	.	.	11	.	6	.	.
Sesleria cylindrica	.	.	.	90	.	.	.	.	.	67
Asperula laevigata	.	.	.	.	.	.	.	6	.	.
Dorycnium hirsutum	.	.	.	.	12	.	.	.	.	.
Helianthemum nummularium	.	.	.	.	.	.	.	.	20	.
Inula conyza	.	.	.	.	.	.	.	.	30	.
Agrostis tenuis	.	.	.	.	.	22	.	.	.	.
Angelica sylvestris	10	.	.	.	.	.	.	.	.	.
Anthericum liliago	.	38	.	.	.	.	.	.	.	.
Arabis sagittata	.	.	.	.	.	.	.	.	20	.
Asplenium trichomanes	.	.	.	.	.	17	.	.	.	.
Brachypodium ramosum	.	.	.	.	.	.	.	.	20	.
Calamagrostis varia	.	13	.	.	.	.	.	.	.	.
Cardamine impatiens	.	.	.	.	.	.	.	6	.	.
Carex montana	.	.	.	.	.	.	.	.	.	33
Carex pallescens	10	.	.	.	.	.	.	.	.	.
Cerastium arvense	.	.	.	.	.	.	.	.	20	.
Epilobium lanceolatum	.	.	.	.	.	11	.	.	.	.
Erica carnea	.	.	.	50	.	.	.	.	.	.
Festuca tenuifolia	.	.	.	.	19	.	.	.	.	.
Fragaria viridis	.	.	.	.	.	.	.	6	.	.
Galium aparine	.	.	.	.	.	.	.	6	.	.
Galium mollugo	.	.	.	.	.	17	.	.	.	.
Geranium sanguineum	.	.	.	.	.	.	.	.	30	.
Glechoma hederacea	.	.	.	.	.	.	.	6	.	.
Hieracium boreale	.	.	.	.	12	.	.	.	.	.
Hieracium crinitum	90	.	.	.	.	.	.	.	.	.
Hieracium glaucinum	.	.	.	.	.	.	.	.	.	50
Hypericum hirsutum	.	.	.	.	.	.	.	.	20	.
Isopyrum thalictroides	.	.	.	.	.	.	.	6	.	.
Juglans regia	10	.	.	.	.	.	.	.	.	.
Juncus inflexus	.	.	.	.	.	11	.	.	.	.
Knautia arvensis	.	.	.	10	.	.	.	.	.	.
Lamium maculatum	.	.	.	.	.	.	.	6	.	.
Lathyrus aphaca	.	.	.	.	.	.	.	6	.	.
Lathyrus latifolius	.	.	.	.	.	.	.	6	.	.
Lavandula angustifolia	.	.	.	.	8	.	.	.	.	.
Lembotropis nigricans	.	.	6	.	.	.	.	.	.	.
Luzula campestris	.	.	.	.	.	.	29	.	.	.
Melampyrum pratense	.	.	11	.	.	.	.	.	.	.
Muscari comosum	.	.	.	.	.	.	.	12	.	.
Myosotis arvensis	.	.	.	.	.	.	.	12	.	.
Paeonia officinalis	.	25	.	.	.	.	.	.	.	.
Peucedanum officinale	.	19	.	.	.	.	.	.	.	.
Pinus nigra	.	.	.	.	.	.	.	.	.	50
Polygala vulgaris	.	.	.	.	.	.	14	.	.	.
Polypodium australe	.	.	.	.	.	.	.	6	.	.
Rosa vosagiaca	.	.	.	.	.	5	.	.	.	.
Rubus tomentosus	.	.	28	.	.	.	.	.	.	.
Rubus vestitus	.	.	.	.	.	.	.	6	.	.
Rumex acetosa	.	.	.	.	.	.	.	25	.	.
Saxifraga bulbifera	.	.	.	.	.	.	.	12	.	.
Saxifraga cuneifolia	.	.	.	10	.	.	.	.	.	.
Silene alba subsp. divaricata	.	.	.	.	.	.	.	6	.	.
Stellaria media	.	.	.	.	.	.	.	19	.	.
Thesium divaricatum	.	.	.	.	.	.	.	.	20	.
Trifolium campestre	.	.	.	.	.	5	.	.	.	.
Trifolium medium	.	.	.	.	.	.	.	.	10	.
Trifolium ochroleucum	.	.	.	.	.	.	.	6	.	.
Vicia ochroleuca	.	.	.	.	.	.	.	.	20	.
Vicia sativa	.	.	.	.	.	.	.	6	.	.
Vicia tenuifolia	.	.	.	.	.	5	.	.	.	.

Tab. 10 - Buxo - Quercenion

1 - Buxo-Quercetum pubescentis (Mondino, 1989)
2 - Buxo-Quercetum pubescentis (Barbero & Bono, 1971)

c = characteristic; d = differential; t = transgressive

	N. column	1	2
	N. releves	38	6
	Quercion pubescenti-petraeae and Buxo-Quercenion		
c	Buxus sempervirens	100	100
c	Amelanchier ovalis	58	.
c	Carex humilis	63	.
c	Cotoneaster nebrodensis	18	.
c	Melica nutans	34	.
c	Catananche coerulea	.	50
c	Primula veris	.	50
d	Astragalus monspessulanus	11	.
d	Primula elatior	11	.
d	Vincetoxicum hirundinaria	34	.
t	Hypericum montanum	32	33
	Carpinion orientalis		
	Cytisus sessilifolius	84	67
	Buphtalmum salicifolium	3	.
	Luzula nivea	8	.
	Colutea arborescens	3	.
	Arabis turrita	18	.
	Peucedanum cervaria	.	50
	Campanula persicifolia	.	33
	Erythronio-Quercion petraeae		
	Genista germanica	16	.
	Polygonatum odoratum	.	33
	Quercetalia pubescenti-petraeae		
	Acer opulifolium	61	50
	Melittis melissophyllum	37	100
	Quercus pubescens	100	100
	Sorbus aria	79	83
	Quercus cerris	5	.
	Stachys officinalis	11	.
	Silene italica subsp. italica	13	.
	Acer monspessulanum	.	67
	Lathyrus niger	.	67
	Brachypodium rupestre	.	67
	Buglossoides purpurocaerulea	.	67
	Helleborus foetidus	.	50
	Lonicera etrusca	.	50
	Sorbus torminalis	.	50
	Fagetalia sylvaticae		
	Poa nemoralis	13	50
	Euphorbia dulcis	18	.
	Fagus sylvatica	16	.
	Fraxinus excelsior	92	.
	Salvia glutinosa	39	.
	Tilia cordata	18	.
	Cephalanthera rubra	.	50
	Querco-Fagetea		
	Lonicera xylosteum	63	33
	Acer campestre	55	83
	Clematis vitalba	13	83
	Corylus avellana	92	50
	Fragaria vesca	58	50
	Hedera helix	61	50
	Viola riviniana+reichenbachiana	61	50
	Epipactis helleborine	16	.
	Hepatica nobilis	32	.
	Viola hirta	87	.
	Carex digitata	39	.
	Betula pendula	16	.
	Brachypodium sylvaticum	8	.
	Carpinus betulus	5	.
	Castanea sativa	32	.
	Cephalanthera longifolia	32	.
	Cruciata glabra	37	.
	Tamus communis	68	.
	Hieracium sylvaticum	53	.
	Festuca heterophylla	16	.
	Primula vulgaris	53	.
	Prunus avium	39	.
	Pulmonaria officinalis	8	.
	Silene nutans	8	.
	Daphne laureola	.	50
	Geum urbanum	.	33
	Hieracium gr. murorum	.	33
	Ilex aquifolium	.	33
	Lathyrus venetus	.	33
	Symphytum tuberosum	.	67
	Rhamno-Prunetea		
	Cornus sanguinea	26	17
	Coronilla emerus	76	50
	Viburnum lantana	53	33
	Crataegus monogyna	71	.
	Juniperus communis	26	.
	Ligustrum vulgare	13	.
	Prunus spinosa	8	.
	Pyrus pyraster	18	.
	Rhamnus alpinus	13	.
	Rhamnus catharticus	13	.
	Rosa canina	39	.
	Rubus gr. corylifolii	32	.
	Cotinus coggygria	.	67
	Rubus ulmifolius	.	33
	Paliurus spina-christi	.	17
	Quercetea ilicis		
	Carex hallerana	16	.
	Other species		
	Teucrium chamaedrys	100	50
	Bromus erectus	18	50
	Inula conyza	11	.
	Pinus sylvestris	18	.
	Anthericum liliago	11	.
	Asperula purpurea	34	.
	Asplenium fontanum	13	.
	Asplenium ruta muraria	26	.
	Asplenium trichomanes	26	.
	Aster bellidiastrum	11	.
	Campanula bertolae	8	.
	Campanula rapunculoides	16	.
	Carex flacca	26	.
	Carex tendae	11	.
	Clinopodium vulgare	61	.
	Dactylis glomerata	32	.
	Epipactis atrorubens	11	.
	Erica carnea	26	.
	Galium album	32	.
	Galium aristatum	8	.
	Geranium sanguineum	50	.
	Gymnocarpium robertianum	8	.
	Helianthemum oelandicum subsp. italicum	16	.
	Hippocrepis comosa	11	.
	Iberis sempervirens	26	.
	Knautia arvensis	18	.
	Origanum vulgare	5	.
	Pimpinella saxifraga	32	.
	Polygala chamaebuxus	53	.
	Prunella grandiflora	11	.
	Sanguisorba minor	13	.
	Saponaria ocymoides	13	.
	Selaginella helvetica	8	.
	Sesleria varia	8	.
	Trifolium alpestre	21	.
	Trifolium rubens	18	.
	Vicia incana	24	.
	Teucrium montanum	18	.
	Agropyron caninum	.	33
	Euphorbia nicaeensis	.	50
	Astragalus glycyphyllos	.	33
	Briza media	.	50
	Centaurea triumfetti	.	50
	Lathyrus filiformis	.	17
	Tanacetum corymbosum	.	67

Tab.11 - Synoptic comparative table at suballiance level

1 - Laburno-Ostryenion carpinifoliae
2 - Campanulo mediae-Ostryenion carpinifoliae
3 - Lauro nobilis-Quercenion pubescentis
4 -Cytiso sessilifolii-Quercenion pubescentis
5 - Teucrio siculi-Quercenion cerridis
6 - Ptilostemo stricti-Quercenion cerridis
7 - Pino calabricae-Quercenion congestae
8 - Quercenion virgilianae
9 - Erythronio dens canis-Quercion petraeae
10 - Quercion pubescenti-petraeae (Buxo-Quercenion)

c = characteristic; d = differential; t = transgressive

	N. column	1	2	3	4	5	6	7	8	9	10
	N. tables	14	9	16	8	19	11	8	7	10	2
	Laburno-Ostryenion carpinifoliae										
c	Digitalis lutea	41	33	6	12,5	.	.	.	.	40	.
c	Helleborus bocconei subsp. bocconei	50	.	19	12,5	32	.	.	.	20	.
c	Laburnum anagyroides	65	44	13	37,5	11	.	.	.	10	.
c	Lilium bulbiferum subsp. croceum	80	33	25	.	26	55	.	.	30	.
c	Melampyrum italicum	38	11	.	.	.	.	.	.	20	.
c	Sanicula europaea	62	.	6	.	26	27	.	.	20	.
d	Carex digitata	72	22	.	.	5	.	.	.	50	50
d	Doronicum columnae	15	.	6	.	.	9	.	.	.	.
d	Polypodium gr. vulgare	58	11	31	.	.	.	12,5	29	50	.
d	Sesleria italica	23	.	6	37,5	.	.	.	.	.	.
t	Bromus ramosus	41	11	6	.	11	9	.	.	10	.
t	Bunium bulbocastanum	23	.	.	.	.	.	.	.	20	.
t	Calamintha sylvatica	38	.	13	.	11	.	.	.	.	.
t	Epipactis helleborine	72	33	25	62,5	11	.	37,5	.	40	50
t	Euonymus latifolius	35	.	.	.	.	9	.	.	.	.
t	Hepatica nobilis	88	89	31	50	11	.	.	.	40	50
t	Lilium martagon	23	11	.	.	.	.	.	.	.	.
t	Lonicera xylosteum	80	44	6	62,5	32	.	.	.	10	100
t	Tilia platyphyllos	23	11	.	.	.	9	.	.	.	.
	Campanulo mediae-Ostryenion carpinifoliae										
c	Buphtalmum salicifolium	.	89	.	.	.	.	.	.	20	50
c	Campanula medium	.	67	.	.	.	.	.	.	10	.
c	Knautia drymeia	8	22	.	.	.	.	.	.	10	.
c	Leucanthemum discoideum	.	22	.	.	.	.	.	.	.	.
c	Luzula nivea	8	67	.	.	.	.	.	.	20	50
d	Lathyrus pratensis	.	67	.	12,5	.	.	37,5	.	.	.
t	Acer opulifolium	18	100	.	25	.	.	.	.	30	100
t	Pulmonaria affinis	.	22	.	.	.	.	.	.	.	.
	Lauro nobilis-Quercenion pubescentis										
c	Anemone hortensis	.	.	31	.	.	9	.	.	.	.
c	Asparagus acutifolius	54	22	100	37,5	53	73	75	86	10	.
c	Cercis siliquastrum	23	.	38	12,5	5	.	.	.	.	.
c	Cyclamen repandum	62	.	56	12,5	68	.	12,5	71	30	.
c	Laurus nobilis	.	.	38	.	32	.	.	14	20	.
c	Pistacia terebinthus	8	.	38	12,5	.	9	.	43	.	.
c	Quercus trojana	.	.	13	.	.	.	.	.	.	.
c	Viburnum tinus	.	.	50	.	32	.	.	.	20	.
d	Clematis flammula	8	.	44	.	11	18	.	.	.	.
d	Dorycnium hirsutum	.	11	19	37,5	.	36	.	.	10	.
d	Dryopteris pallida	8	.	19	.	.	.	.	57	.	.
d	Osyris alba	8	.	31	37,5	21	18	12,5	43	.	.
d	Phillyrea latifolia	.	.	50	.	42	27	12,5	14	10	.
d	Pinus halepensis	.	.	13	.	.	.	.	.	.	.
d	Rosa sempervirens	15	.	94	.	79	27	62,5	86	20	.
d	Rubia peregrina	38	33	100	12,5	74	45	62,5	86	40	.
	Cytiso sessilifolii-Quercenion pubescentis										
c	Chamaecytisus hirsutus	.	22	13	50	16	45	.	.	20	.
c	Chamaecytisus spinescens	.	.	.	25	.	.	.	.	.	.
c	Cytisus sessilifolius	69	78	50	100	21	27	.	.	20	100
c	Inula salicina	8	11	13	62,5	5	.	.	.	10	.
c	Juniperus oxycedrus	15	33	19	50	11	.	.	.	.	.
c	Melampyrum cristatum	.	.	.	62,5	11	.	.	.	10	.
c	Peucedanum cervaria	.	33	25	50	5	.	.	.	10	50
d	Carex hallerana	.	22	6	75	5	18	.	.	.	50
d	Helianthemum nummularium	8	.	.	37,5	.	18	.	.	10	.
d	Inula conyza	31	.	31	62,5	16	.	.	.	10	50
d	Knautia purpurea	.	.	.	37,5	.	9	.	.	.	.
d	Polygala nicaeensis	.	.	.	12,5	.	9	.	.	.	.
d	Spartium junceum	8	22	25	50	5	9	25	29	.	.
	Carpinion orientalis										
c	Acer obtusatum	85	.	38	37,5	16	45	.	.	20	.
c	Campanula persicifolia	34	44	6	.	.	.	.	.	10	50
c	Carpinus orientalis	38	.	38	25	21	82	.	.	10	.
c	Cnidium silaifolium	26	22	19	25	.	18	37,5	29	.	.
c	Colutea arborescens	31	.	25	37,5	.	9	.	.	.	50
c	Coronilla emerus subsp. emeroides	15	.	75	12,5	32	.	.	.	.	.

c	Ostrya carpinifolia	100	89	75	100	58	55	.	.	70	.
c	Peucedanum verticillare	34	22	6	.	.	.	.	.	.	.
c	Sesleria autumnalis	15	44	25	.	.	55	.	.	10	.
d	Cotinus coggygria	23	22	13	.	.	.	.	.	.	50
d	Dianthus monspessulanus	8	11	.	.	.	.	.	.	.	.
d	Orchis purpurea	50	.	25	50	11	.	.	.	.	.
d	Silene italica subsp. nemoralis	8	.	13	25	.	.	.	.	.	.
d	Vicia grandiflora	8	.	.	.	11	.	.	.	.	.
t	Acer monspessulanum	62	.	44	37,5	32	36	12,5	14	20	50
t	Arabis turrita	46	22	19	25	.	27	25	14	.	50
t	Melittis melissophyllum	95	100	56	62,5	53	27	.	.	60	100
t	Saxifraga rotundifolia	8	11	.	.	.	.	.	.	.	.
t	Staphylea pinnata	15	.	.	.	.	.	.	.	.	.
t	Viola hirta	8	22	6	12,5	.	36	.	.	10	50
	Teucrio siculi-Quercenion cerridis										
c	Carex depauperata	.	.	.	.	5	.	.	.	.	.
c	Carex grioletii	.	.	.	.	5	.	.	.	.	.
c	Carex sylvatica	23	.	.	.	32	36	.	.	20	.
c	Erica arborea	.	56	19	12,5	68	27	50	14	80	.
c	Lychnis flos-cuculi	.	.	.	.	21	9	.	.	30	.
c	Quercus crenata	.	.	.	.	5	.	.	.	.	.
d	Arbutus unedo	.	.	13	.	37	9	12,5	14	30	.
d	Cytisus scoparius	8	22	.	.	58	.	.	.	60	.
d	Erica scoparia	.	.	.	.	21	.	.	.	50	.
d	Pyracantha coccinea	23	.	19	75	47	.	.	.	20	.
t	Crataegus laevigata	62	22	6	.	58	27	12,5	.	10	.
t	Hieracium racemosum	8	.	.	.	21	.	.	.	20	.
	Ptilostemo stricti-Quercenion cerridis										
c	Echinops sphaerocephalus subsp albidus	.	.	.	.	.	36	.	.	.	.
c	Helleborus bocconei subsp. siculus	.	.	.	.	.	55	.	.	.	.
c	Heptaptera angustifolia	.	.	.	.	.	45	.	.	.	.
c	Lathyrus digitatus	.	.	.	.	.	73	.	.	.	.
c	Lathyrus grandiflorus	.	.	.	.	.	45	.	.	.	.
c	Lathyrus jordanii	.	.	.	.	.	18	.	.	.	.
c	Melittis albida	.	.	.	.	.	45	25	.	.	.
c	Paeonia mascula	.	.	.	.	.	18	12,5	14	.	.
c	Physospermum verticillatum	.	.	.	.	.	64	.	14	.	.
c	Vicia barbazitae	.	.	.	.	.	27	.	.	.	.
d	Pimpinella anysoides	.	.	.	.	.	55	62,5	14	.	.
d	Stachys heraclea	.	.	.	.	.	18	.	.	.	.
d	Stipa bromoides	.	.	.	.	.	36	.	29	.	.
d	Trifolium patulum	.	.	.	.	.	18	.	.	.	.
d	Vinca major	.	.	6	.	5	45	.	.	.	.
t	Centaurea centaurium	.	.	.	.	.	9	.	.	.	.
t	Digitalis ferruginea	.	.	.	.	.	27	.	.	.	.
t	Euphorbia corallioides	.	.	.	.	.	36	.	.	.	.
t	Huetia cynapioides	.	.	.	.	.	18	.	14	.	.
	Teucrio siculi-Quercion cerridis										
c	Crepis leontodontoides	.	.	25	25	21	91	87,5	57	20	.
c	Cytisus villosus	.	11	13	.	5	82	87,5	29	30	.
c	Digitalis micrantha	40	22	6	25	26	64	12,5	.	10	.
c	Echinops siculus	.	.	.	.	16	18	25	.	.	.
c	Iris foetidissima	.	.	.	.	11	.	12,5	.	.	.
c	Lychnis coronaria	.	.	.	.	11	18	.	.	.	.
c	Malus florentina	.	.	.	12,5	26	18	.	.	10	.
c	Ptilostemon strictus	8	.	13	.	11	73	.	.	.	.
c	Quercus frainetto	.	.	.	.	47	91	.	.	.	.
c	Silene viridiflora	.	.	6	.	26	18	37,5	.	.	.
c	Teucrium siculum	8	.	25	.	37	64	87,5	29	.	.
c	Veronica chamaedrys	8	.	.	.	.	82	.	.	.	.
d	Alliaria petiolata	8	22	.	.	.	45	.	.	.	.
d	Aristolochia rotunda	8	.	.	.	42	9	12,5	29	20	.
d	Fraxinus oxycarpa	.	.	.	.	16	.	.	.	.	.
d	Genista tinctoria subsp. tinctoria	23	22	6	25	26	45	.	.	20	.
d	Ligustrum vulgare	46	44	50	50	79	55	.	.	40	50
d	Mespilus germanica	8	11	.	.	47	.	.	14	50	.
d	Pulicaria odora	.	.	13	.	16	45	37,5	43	.	.
d	Rumex sanguineus	.	.	.	.	11	36	12,5	.	10	.
t	Asperula laevigata	.	.	6	.	5	45	25	.	10	.
t	Lathyrus niger	18	22	.	25	53	64	.	.	60	50
t	Malus sylvestris	46	22	13	.	63	82	12,5	.	60	.
t	Oenanthe pimpinelloides	.	.	31	.	68	55	25	14	50	.
t	Poa sylvicola	.	.	25	.	21	45	75	29	40	.
t	Ranunculus lanuginosus	15	.	.	.	37	55	25	.	40	.
t	Hypericum perfoliatum	.	.	.	.	.	27	12,5	.	.	.
	Pino calabricae-Quercenion congestae										
c	Pinus nigra subsp. calabrica	.	.	6	.	.	.	25	.	.	.
c	Quercus congesta	.	.	6	.	.	.	100	.	.	.
c	Quercus dalechampii	.	.	.	.	.	.	100	14	.	.
c	Rubus aetnicus	.	.	6	.	.	.	25	14	.	.
c	Scutellaria columnae subsp. gussonei	.	.	.	.	.	9	37,5	29	.	.
c	Symphytum gussonei	.	.	.	.	.	.	25	.	.	.
d	Conopodium capillifolium	.	.	.	.	.	.	37,5	.	.	.
d	Hypochoeris laevigata	.	.	.	.	.	27	50	29	.	.
d	Quercus fontanesii	.	.	.	.	.	.	13	.	.	.
d	Quercus gussonei	.	.	.	.	.	.	13	.	.	.
d	Quercus leptobalana	.	.	.	.	.	.	13	.	.	.
	Quercenion virgilianae										
c	Acanthus mollis	.	.	.	.	.	.	.	43	.	.

c	Clematis cirrhosa	.	.	.	.	.	.	.	43	.	.
c	Origanum heracleoticum	.	.	.	.	.	.	12,5	29	.	.
c	Quercus virgiliana	.	.	.	.	.	.	.	43	.	.
d	Olea europaea var. sylvestris	.	.	.	.	.	.	.	43	.	.
d	Pistacia lentiscus	.	.	25	.	5	18	.	43	.	.
d	Rhamnus alaternus	8	.	31	.	16	.	50	43	.	.
	Pino calabricae-Quercion congestae										
c	Agropyron panormitanum	.	.	.	.	.	9	12,5	14	.	.
c	Helleborus bocconei subsp. intermedius	.	.	.	.	.	.	12,5	14	.	.
c	Myosotis sylvatica subsp. elongata	.	.	.	.	.	.	12,5	.	.	.
c	Paeonia mascula subsp. russii	.	.	.	.	.	.	37,5	29	.	.
c	Quercus amplifolia	.	.	.	.	.	.	.	43	.	.
c	Rubus aetnicus	.	.	6	.	.	.	25	14	.	.
c	Scutellaria columnae subsp. gussonei	.	.	.	.	.	9	37,5	29	.	.
c	Symphytum gussonei	.	.	.	.	.	.	25	.	.	.
c	Silene sicula	.	.	.	.	.	9	37,5	29	.	.
c	Thalictrum calabricum	.	.	6	.	.	.	75	14	.	.
d	Achillea ligustica	.	.	6	.	.	18	37,5	43	.	.
d	Allium paniculatum	.	.	.	.	.	.	12,5	29	.	.
d	Allium siculum	.	.	.	.	.	.	25	.	.	.
d	Aristolochia clusii	.	.	.	.	.	.	.	14	.	.
d	Betula aetnensis	.	.	.	.	.	.	12,5	.	.	.
d	Calicotome infesta	.	.	13	.	.	18	50	43	.	.
d	Carex distachya	.	.	25	.	11	36	87,5	100	.	.
d	Centaurea parlatoris	.	.	.	.	.	.	25	.	.	.
t	Celtis australis	.	.	.	.	.	.	.	29	.	.
t	Clinopodium vulgare subsp. arundanum	.	.	.	.	.	.	76	57	.	.
	Erythronio dens canis-Quercion petraeae										
c	Erythronium dens canis	8	.	.	12,5	.	.	.	.	20	.
c	Genista germanica	.	11	.	.	21	.	.	.	70	50
c	Helleborus odorus subsp. laxus	8	.	.	.	.	.	.	.	10	.
c	Helleborus viridis	15	22	6	25	.	.	.	.	40	.
c	Lathyrus montanus	8	44	.	.	5	.	.	.	70	.
c	Luzula pedemontana	8	11	.	.	.	.	.	.	30	.
c	Physospermum cornubiense	8	44	.	37,5	16	.	.	.	100	.
c	Polygonatum odoratum	8	11	.	.	.	.	.	.	40	50
d	Deschampsia flexuosa	8	33	.	.	5	.	.	.	40	.
d	Genista pilosa	.	33	.	.	11	.	.	.	50	.
d	Iris graminea	.	.	.	12,5	.	.	.	.	10	.
d	Phyteuma michelii	.	.	.	.	.	.	.	.	20	.
d	Pinus sylvestris	.	22	.	25	.	.	.	.	30	50
d	Teucrium scorodonia	8	.	.	.	21	.	.	.	90	.
t	Anemone nemorosa	8	.	.	.	26	.	.	.	70	.
t	Anemone trifolia	31	33	6	.	.	.	.	.	30	.
t	Dactylorhiza maculata	38	22	6	.	11	.	.	.	40	.
t	Listera ovata	23	11	.	25	.	.	.	.	30	.
t	Luzula sylvatica	38	11	6	.	11	9	.	.	50	.
t	Platanthera clorantha	23	22	.	37,5	16	.	.	.	60	.
t	Populus tremula	8	.	6	.	5	.	.	.	50	.
t	Quercus petraea	15	.	6	.	47	.	.	.	80	.
	Quercion pubescenti-petraeae (Buxo-Quercenion)										
c	Amelanchier ovalis	.	11	.	.	.	.	.	.	.	50
c	Buxus sempervirens	8	22	.	12,5	.	.	.	.	.	100
c	Carex humilis	8	.	.	.	.	.	.	.	.	50
c	Catananche coerulea	.	22	.	.	.	.	.	.	.	50
c	Cotoneaster nebrodensis	.	.	6	.	.	.	.	.	.	50
c	Melica nutans	.	.	.	.	.	.	.	.	.	50
c	Primula veris	.	44	13	.	.	.	.	.	.	50
d	Astragalus monspessulanus	.	44	.	50	.	9	.	.	.	50
d	Primula elatior	.	.	.	.	.	.	.	.	.	50
d	Vincetoxicum hirundinaria	8	33	.	25	5	.	.	.	20	50
t	Hypericum montanum	38	78	.	25	37	.	.	.	40	100
	Quercetalia pubescenti-petraeae										
	Agrimonia eupatoria	8	.	6	12,5	37	55	37,5	14	.	.
	Aristolochia lutea	15	33	.	.	16	73	50	.	20	.
	Arum italicum	15	.	25	.	21	18	12,5	43	10	.
	Asparagus tenuifolius	8	22	.	25	16	.	.	.	40	.
	Brachypodium rupestre	72	100	63	100	47	36	.	.	100	50
	Buglossoides purpurocaerulea	69	44	94	50	79	73	25	14	30	50
	Cornus mas	88	33	38	87,5	84	45	.	.	60	.
	Epipactis microphylla	.	.	.	.	.	.	12,5	.	10	.
	Fraxinus ornus	100	100	94	100	95	73	50	43	90	.
	Helleborus foetidus	54	78	19	12,5	21	64	.	.	.	50
	Limodorum abortivum	8	.	6	.	.	.	25	.	10	.
	Lonicera etrusca	31	33	81	50	32	64	75	57	20	50
	Melica arrecta	.	.	.	.	16	9	25	29	.	.
	Peucedanum oroselinum	.	22	.	.	.	18	.	.	10	.
	Quercus cerris	95	56	50	75	95	100	25	.	90	50
	Quercus pubescens	100	100	81	100	68	55	.	57	90	100
	Ranunculus neapolitanus	.	.	13	.	.	36	62,5	57	.	.
	Scutellaria columnae	23	.	31	.	32	82	.	.	10	.
	Serratula tinctoria	26	33	19	37,5	53	18	.	.	60	.
	Silene italica subsp. italica	46	11	31	.	26	82	12,5	14	30	50
	Sorbus aria	77	78	.	25	.	.	.	.	10	100
	Sorbus domestica	72	.	56	87,5	89	82	12,5	29	70	.
	Sorbus torminalis	72	22	13	50	84	73	.	14	90	50
	Stachys officinalis	58	33	56	62,5	84	64	.	.	80	50
	Viola alba subsp. dehnhardtii	95	.	88	87,5	84	55	50	57	70	.