



# Abstract book

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## Floristic, ecological and chorological differentiation of Italian *Quercus cerris* woods

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Turkey oak forests have great importance in the Italian vegetation because widely distributed and extensive, covering approximately 280,000 ha along the Peninsula; the Potential Natural Vegetation dominated by this oak could cover approximately 14% of the Italian territory. Due to the possibility of occupying different bioclimatic belts, from the Mediterranean to Temperate region, *Quercus cerris* forests display a huge variability in their floristic composition. As a consequence, from a phytosociological point of view, they have been traditionally referred to different alliances of *Quercetalia pubescentis* and *Fagetalia sylvaticae*. However, an overall vegetation analysis and classification of *Q. cerris* forests, based on a large dataset, is still missing in Italy. In this context, we performed the first comprehensive analysis of the Italian *Q. cerris*-dominated forests, focusing on the main ecological and biogeographical patterns, in order to: i) explore their variation in floristic composition; ii) assess the relative importance of environmental and biogeographical factors in the differentiation of Italian *Q. cerris* communities; iii) evaluate the effectiveness of current syntaxonomical classifications at alliance level. We here present some preliminary results.

We compiled a comprehensive database of about 2,900 relevés including all the published data (64%) plus several original data of the Authors (36%). Criteria for the inclusion in the dataset were basically: *Q. cerris* cover value  $\geq 3$  in the Braun-Blanquet cover/abundance scale; no other tree species with cover values  $> 3$  in the higher tree layer. Data span between 1960 to 2016, with the most of the relevés surveyed after 1980.

The dataset covers all the Italian Regions with the exception of Sardinia, where the species is absent, and Valle d'Aosta, Trentino-Alto Adige and Veneto where there are no relevant forest coenoses dominated by *Q. cerris*. Relevè range from 10 to 1,410 m a.s.l. in altitude, from Thermo-Mediterranean to Supratemperate in terms of bioclimatic belts. Taxonomic nomenclature was carefully standardized following the most recent checklist of the Italian flora; the resulting species list includes 1,202 taxa. Cluster analysis was performed in JUICE using the modified TWINSpan procedure. Classification was stopped at the best judged interpretable level between those jointly indicated by the results of Crispness and OptimClass analysis. Diagnostic species identification within the clusters was based on the phi coefficient. To analyze the groups resulted from cluster analysis from a structural and chorological point of view, percentage values for different life forms and chorotypes were weighted on the basis of the frequency values in the synoptic tables. As no directly measured ecological parameters were available for the entire dataset, we performed an indirect ecological analysis using the Ellenberg Indicator Values (EIV); the differences between clusters were evaluated by the means of non parametric Mann-Whitney U tests.

We detected nine floristically and ecologically well interpretable groups. At the highest hierarchical level, the first division separates the Thermo- and Meso-Mediterranean coenoses (cluster 1-2) from the temperate ones (cl. 3-9). Within the latter, the groups 3 and 4 contain the most acidophilous communities, exclusively found in the northern Apennines and in the piedmont of the Alps. Clusters 5-6 encompass the bulk of the central Italian *Q. cerris* forests. Cluster 7 identifies the submontane communities from central and northern Italy. Cluster 8 is clearly characterized from a biogeographically point of view and identifies the southern Apennines communities. Finally, cluster 9, that at the lowest hierarchical level is closely related to cluster 8, includes the most mesophilous *Q. cerris* forests of the central and northern Apennines, that in previous studies have been generally referred to *Fagetalia sylvaticae*. EIV analysis confirms this general pattern and Temperature, Humidity and Soil pH result as the best performing indices to distinguish among the clusters. The highest species richness was detected in the coenoses of the southern Apennines (cluster 8) and the lowest in the most acidophilous ones (cluster 3).

Several inconsistencies emerged in the syntaxonomical interpretation of these groups at the alliance and suballiance level, since no one of the schemes proposed in the past fully complies with the results of the cluster analysis of such a large and comprehensive dataset. The possible syntaxonomic solutions are at present under study and will be presented in a forthcoming contribute.