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instituto agroforestal mediterraneo
DEPARTAMENTO DE ECOSISTEMAS AGROFORESTALES

Changes in the flora and vegetation of the protected area "La Murta y la Casella" over a period of 72 years

Pastor, Marcos,[1] Garmendia, Alfonso,[2] Merle, Hugo [1] & Ferriol, María [2]

[1] Dpto. de Ecosistemas Agroforestales, Universitat Politècnica de València, Spain. [2] Inst. Agroforestal Mediterráneo, Universitat Politècnica de València, Spain, mafermo@upvnet.upv.es

Introduction

During the last decades, the vegetation of the Mediterranean forests has been transformed due to the abandonment of traditional agro-silvo-pastoral systems, climate change and globalization. The analysis of changes in vegetation patterns over time has been increasingly used to predict the effects of these phenomena. One of the most significant protected areas of the Valencian Community (Spain) is the Municipal Natural Park (PNM) "La Murta y la Casella" because it holds relict forests with ash trees and other deciduous species located very close to the sea (Fig. 1). Jose Borja performed in 1950 a study of the flora and vegetation of this PNM that is of great value because of its antiquity and level of detail. The main objective of the present study is to compare the lists of flora and phytosociological relévés performed in 1950 with those performed nowadays, 72 years later.

Fig. 1 Location of the Municipal Natural Park (PNM) "La Murta y la Casella" in Eastern Spain (yellow arrow).

Materials and methods

A total of 37 relévés were carried out reproducing as much as possible the methodology and location of Borja. Seven communities were sampled (Fig. 2).

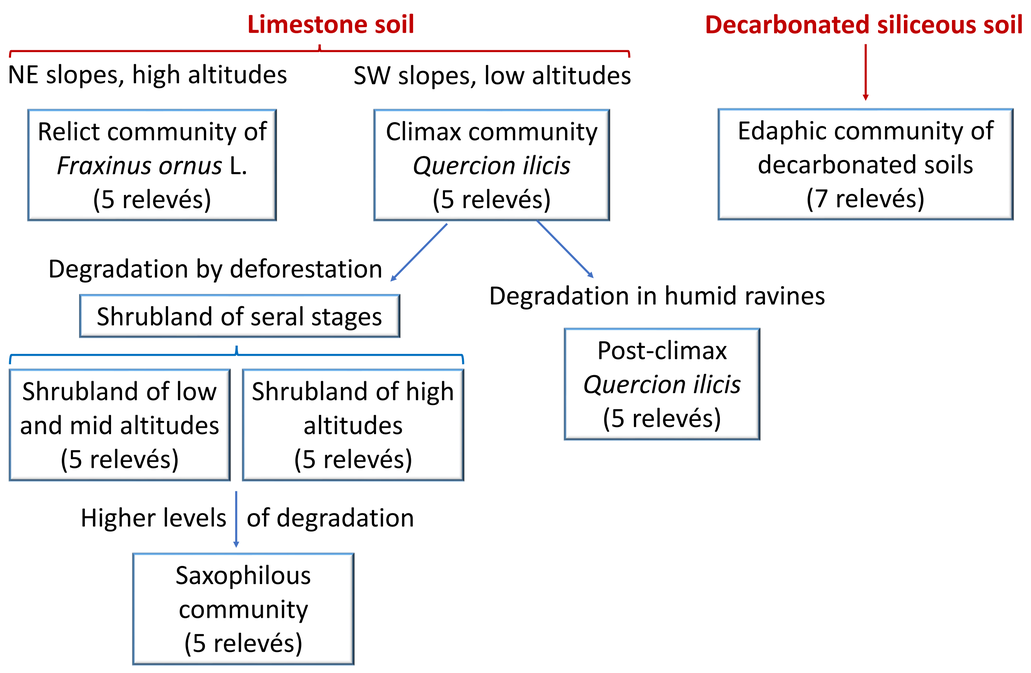

Fig. 2 Sampled communities, ecological and successional relationships among them and number of relevés performed.

Results

A total of 110 different taxa included in 45 families were recorded within the relévés. In all the communities, very rare and rare species in the Valencian Community that corresponded mostly with endemics and temperate species (e.g., *Fritillaria hispanica* Boiss. & Reut., *Jasione montana* L.) could not be found. Besides this common trait, various patterns of change along time were observed depending on the community (Fig. 3). The more mature communities corresponding to the forests of *F. ornus* and post-climax *Quercion ilicis* have incorporated Mediterranean species and lost temperate species (e.g., *Verbascum chaixii* Vill., *Rosa agrestis* Sw.). Despite these losses, many of the most representative elements of the relict local flora still exist, such as ash, gall oak and maple, reinforcing the role of microclimatic refugia in the Mediterranean. On the other hand, seral communities have progressed towards climax following a secondary progressive succession, likely due to the abandonment of traditional activities, especially wood and firewood extraction and grazing. As a consequence, a homogenization of the landscape was observed, which was characterized in 1950 by a mosaic structure where each spot had different species. Finally, endemic species of Ibero-Levantine origin (e.g., *Helianthemum croceum* (Desf.) Pers.) have been lost in the shrublands developing on limestone soils, whereas the number of Mediterranean species of wider distribution has increased. The floristic composition of the reduced and inaccessible community of siliceous soil has not suffered remarkable changes over time, and still holds species of great ecological value in the coastal areas of the Valencian Community, such as *Pteridium aquilinum* (L.) Kuhn.

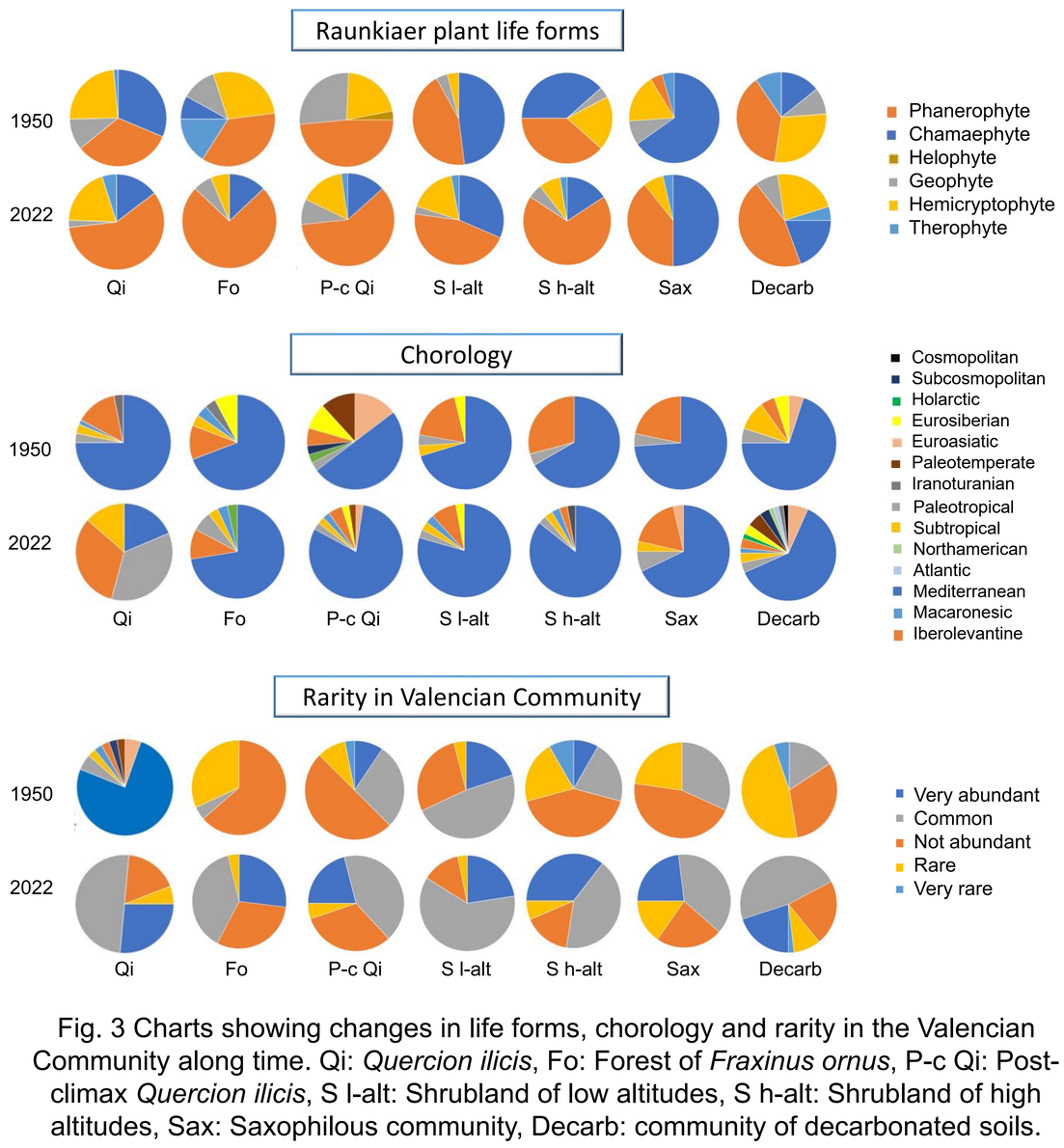

Fig. 3 Charts showing changes in life forms, chorology and rarity in the Valencian Community along time. Qi: *Quercion ilicis*, Fo: Forest of *Fraxinus ornus*, P-c Qi: Post-climax *Quercion ilicis*, S l-alt: Shrubland of low altitudes, S h-alt: Shrubland of high altitudes, Sax: Saxophilous community, Decarb: community of decarbonated soils.

Pictures showing changes in vegetation. Above: 1950. Below: 2022. from left to right: valley of La Murta. Forest of *Fraxinus ornus* in the northern slope and Mediterranean *Quercetum ilicis* in the southern slope. *Pteridium aquilinum* in the valley of La Casella. Saxophilous vegetation of the upper southern slope of La Murta (Cavall Bernat).

Actual lists of plant taxa and relévés: http://hdl.handle.net/10251/190916

Reference: Borja, J. 1950. Estudio fitogeográfico de la Sierra de Corbera (Valencia). Anales Jard. Bot. Madrid 9: 361-483.