

IMPORTANCE OF REFUGIA IN SHAPING MEDITERRANEAN PLANT BIODIVERSITY

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Recent research combining genetics and biogeography, i.e. phylogeography, has shown that glacial refugia have had a previously unsuspected role in shaping modern biodiversity in temperate regions, in particular to explain both the survival of paleoendemics and the speciation of neoendemics. The Mediterranean Basin hotspot represents a major biogeographical crossroads where several lineages have persisted or have been differentiated since the Tertiary. Conservation of the unique Mediterranean biodiversity is recognised as a world-scale priority and the identification and description of refuge areas is critical for an optimal evolutive conservation of this highly threatened ecoregion. We present here a detailed analysis of the scientific literature in order to identify refugia in the Mediterranean region, based upon intraspecific phylogeographical studies of plant species. 50 glacial refugia are identified, and with a shared total of 24 refugia, the role played by the three major peninsulas (iberic, italian and balkan) is confirmed. Also, we emphasize the importance of areas that have previously been attributed a lesser role (large Mediterranean islands, North Africa, Turkey and Catalonia-Provence).

There is growing evidence at both a global-scale and for Mediterranean-type ecosystems, indicating that areas with high contemporary diversity and endemism are those that have experienced long-term climate stability. Biodiversity hotspots coincide indeed generally with areas that were buffered against climatic extremes. Our results are consistent with these broad patterns and suggest that the Mediterranean refugia would have been least affected by global climatic changes compared to Europe. These 50 identified Mediterranean refugia are strictly coincident with the major plant endemism areas (i.e. level of range-restricted endemics > 10%) and the regional biodiversity hotspots, which are mainly situated on islands and mountains.

These ecologically and climatically stable areas have a high conservation priority because they constitute threatened key-areas for the long-term persistence of species and genetic diversity, faced with the extensive environmental changes occurring around the Mediterranean Sea. Mediterranean refugia represent generally “phylogeographical hotspots”, i.e. significant reservoirs of unique genetic diversity for preserving the future of evolutionary processes of Mediterranean species.