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Conference Abstract

Past, Present, and Future of Marcescent Mediterranean Forests

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Abstract

Mediterranean forests are unique and one of the most threatened biomes worldwide (Klausmeyer and Shaw 2009). They are distributed through marked ecological gradients that are supported by a wide variety of diverse geology and contrasting bioclimatic conditions.

Marcescence (i.e., the abscence of leaf fall abscission; Addicott 1982), is a life-history trait related to contrasting or transitional climatic areas such as those across Eurosiberian and Mediterranean Regions (García-Mijangos et al. 2014). Thus, marcescent forests are ecotones located in the transition between temperate areas with cold winters and mild rainy summers and mediterranean regions with dry and hot summers (Rivas-Martínez et al. 2017).

We aim to provide a global overview of marcescent forests in the Mediterranean basin, a significant ecotone in terms of biogeography and conservation, by exploring the main ecological drivers that have promoted past, current and future changes in the distribution ranges of several oak species.

We used a subset of oak species from the subsection *Galliferae* (*Quercus* L.), to unveil biogeographic relationships and recent or past contact between taxa, thus bringing insights to its evolutionary history and speciation. A database was built with records obtained from extensive fieldwork, herbaria review and online resources (e.g., Global Biodiversity Information Facility (GBIF), scrutinized by taxonomic experts. We used downscaled climate data to obtain potential distribution of each species through an ensemble-modelling framework (biomod2 - R package, Araújo and New 2007, Thuiller et al. 2009), across different past (Last Glacial Maximum and Middle Holocene), present and future scenarios (2050 and 2080 Hijmans et al. 2005; Representative Concentration Pathway (RCP) 4.5 IPCC 2013).

Results provide new insights to advance our current understanding of the biogeographic trajectories of transiently co-occurring oak species, at the boundary of two major biomes and biogeographic regions in Southern Europe and North Africa.

Furthermore, we highlight the importance of these forests for biodiversity conservation, not only as refuge of relict and narrow endemic species, but particularly for understanding white oak biogeography and evolution in Europe, anticipating future shifts driven by anthropogenic climate change.

Keywords

climate change, forecast, habitat-suitability models, hindcast, oak forests, *Quercus*, species distribution models

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No conflict of interest was reported by the authors.

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