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and location. Here, we use this principle to identify the factor limiting tree species performance along the latitudinal gradient of US forests. To this end, we fitted quantile regressions of basal area for 114 species distributed in 18,446 plots of the US Forest Inventory and identify whether the limiting factor is biotic (symmetric and asymmetric competition) or abiotic (drought, winter temperature, pH, nitrogen and organic carbon) at each plot. Our results challenge Darwin's classical hypothesis, as the probability of biotic factors limiting tree basal area increases with latitude. Specifically, competition had an approximately 20% probability of being the limiting factor at high latitudes in contrast to any other abiotic factor, which did not exceed this value. Additionally, winter temperature acted as the limiting factor mainly at low latitudes. These unexpected results could be related to the positive effects of rising temperature on tree performance at high latitudes due to climate change. Overall, our findings suggest that climate change could be altering the performance and distribution of tree species across Northern Hemisphere forests, deviating from predictions made by Darwin.

S.036. COMPARATIVE SPATIAL PHYLOGENETICS OF MEDITERRANEANTYPE FLORAS OF THE WORLD

P.0297 Convergent evolution in Mediterranean oaks

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Oaks (*Quercus* L.) are distributed all around the northern hemisphere occupying a wide range of different climates. Phylogenetically, genus *Quercus* is divided into two subgenera: subgenus *Quercus* (New World oaks) and subgenus *Cerris* (Old World oaks). Both subgenera are hypothesized to have very different ancestors and evolutionary histories. New World species are supposed to have originated in the northernmost part of North America and colonized this continent as far as tropical regions in Mesoamerica and some regions in Eurasia. By contrast, Old World species are likely to have arisen under tropical regions in Southeast Asia and later colonize the Himalayas, temperate regions of Asia, and, finally, the Mediterranean Basin. Our study searches leaf morphological convergences between oaks from different subgenera (even different sections) but adapted to a similar climate. Specifically, we analyzed the leaf adaptation to Mediterranean climates where oaks occur, the Mediterranean Basin and California. We have sampled 190 oaks species from around the world growing in The Pouyouleix Botanical Garden (France), and measured several leaf morphological traits, that have been summarized into an index created *de novo* for this study. We have also used occurrence data from GBIF database to extract WorldClim climatic variables from the natural distribution of each oak. We have seen that summer aridity is the best variable defining the Mediterranean climate. Finally, the phylogeny of the genus has been used to perform the phylogenetic analyses. Mediterranean species resulted to be 38. We did not find significant differences in the rate of evolution of the morphological index but we detected significant shifts in the phylogeny when modelling summer aridity. Moreover, our analyses identified two leaf syndromes in response to the Mediterranean climate. We conclude that it exists a convergent but not exclusive morphology in one leaf syndrome, those with small rounded evergreen sclerophyllous leaves.

P.0298 Evolutionary time as an underlying driver for hyperdiversity across