



Vulnerability of *Quercus ilex* facing increasing drought: which functional adjustments?

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In the Mediterranean basin, precipitation is expected to decline as a consequence of climate change, and so will induce summer drought duration and intensity increase. The responses of a *Quercus ilex* coppice to such a decline in water availability were studied for several years within a throughfall exclusion experiment. This study focuses on the ecophysiological and morphological responses that modify transpiration and productivity. The main mechanisms regulating transpiration under decreasing water availability were assessed: stomatal control, twig and stem hydraulic conductance and leaf area adjustment. The decline of transpiration due to the reduced water availability was mainly driven by a reduced leaf area. In the meantime, other hydraulic traits were not significantly modified by the increased drought severity. The phenotypic plasticity of *Quercus ilex* leaves yielded some modifications of leaf traits, but with slight concurrent consequences on leaf photosynthesis. The decreased water availability reduced carbon assimilation and, in turn, the primary growth and the starch storage of trees. Finally, none of the several adjustments to the long-term experimentally increased drought was observed to reduce the individual vulnerability to water stress.