



Is between-tree variability of water use in a *Quercus ilex* coppice a way to face increasing drought?

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Drought has been identified as one of the major factor shaping vegetation and controlling plant functions in Mediterranean-type ecosystems. Nevertheless, as many other genera largely present in southern Europe (e.g. *Olea*, *Pinus*, *Phyllirea*), the genus *Quercus* was present in southern Europe before the establishment of true Mediterranean climatic conditions. It is therefore important to address the question of the non necessary optimality of physiological and anatomical properties of these species with regard to present and predicted climatic conditions.

Present climatic data are already indicating that climate is changing in Mediterranean region with a modification of rainfall patterns and an increase of summer drought. In order to maintain satisfactory hydraulic functioning, plants can respond to changes in water resources by a combination of short-term modifications, mainly involving stomatal closure, regulation of transpiration rate and hydraulic conductivity, and long-term changes implying structural adjustments. The different mechanisms involved in plant responses to drought were studied in the Puéchabon oak forest located near Montpellier. The last clear cut was performed in 1942, all stems are even-aged. Important between-tree variability in structure (diameter at breast height, xylem anatomy), and functioning (asynchrony of leaf phenology, range between water potential at predawn and at midday, maximum stomatal conductance, maximal sap flux density) was observed. These observations may correspond to fine adjustments revealing the existence of different strategies in the *Quercus ilex* population facing drought. Vulnerability assessments of Mediterranean forests facing climatic changes have to take into account

this between-tree diversity of responses.