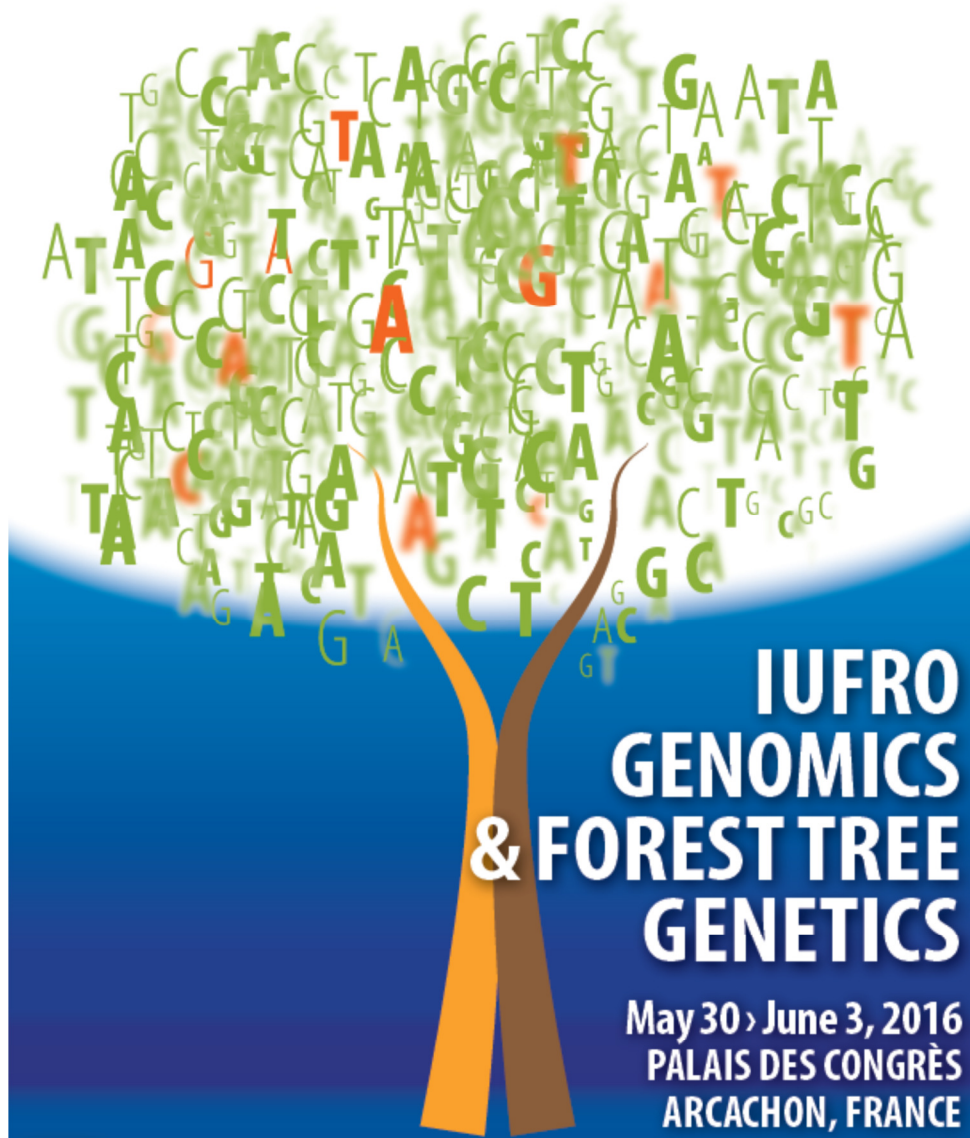


# Abstract Book



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**Population differences in cork oak for growth and survival under contrasting environmental conditions**

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In the face of climate change, understanding the adaptation potential of woody species to cope with different environmental stress events (e.g., drought, frost, pests and diseases) is required to develop sustainable forest management practices. In this context, a key issue when pursuing reforestation actions is to know whether current locally adapted provenances will still show good survival and growth under changing environmental conditions. Cork oak (*Quercus suber*) is an economic and ecological valuable tree species in the Portuguese forest ecosystems, with a wide distribution across the Mediterranean basin. Since the species' broad natural distribution encompasses contrasting climate and geographic conditions, a high level of provenance variation can be expected in fitness and functional traits through genetic adaptation and/or phenotypic plasticity. In this context, cork oak provenance trials represent a valuable resource to assess the level and pattern of variation between and within provenances, while also allowing the identification of the most adapted seed sources to be used in afforestation activities. Thirty five provenances, covering the entire range of the species' natural distribution, were tested in multi-environment trials established in 1998 under different environmental conditions in Portugal. At age 14 years from planting, height growth, aboveground diameter and survival were assessed in two of the provenance trials that were located at sites with contrasting climate and altitude. Using a multi-site linear mixed model, preliminary results revealed highly significant differences between site means, as well as highly significant provenance variance within sites, for all the analyzed traits. Provenances originating from North Africa, in particular Moroccan provenances, presented the highest survival rates and were the fastest growing in both

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trials, and thus performing better than local provenances. Using climate data obtained from the sites of provenance origin, multivariate analyses were applied to classify provenances into "climatic groups", and then we have explored whether the magnitude and significance of previous estimates of model parameters were affected by including climatic group as a fixed term in the linear mixed model.