

Back to the future: REtrospective and prospective dendrogenomic insights in silver fir Adaptation to face the ClimaTe crisis (REACT)



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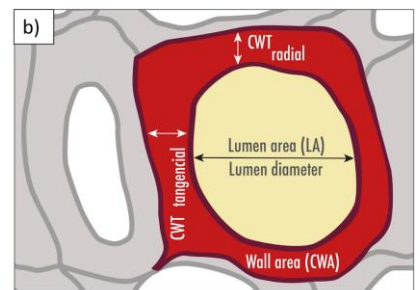
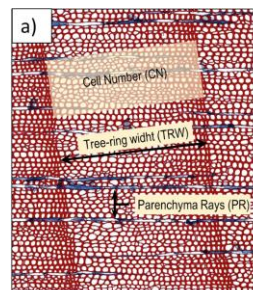
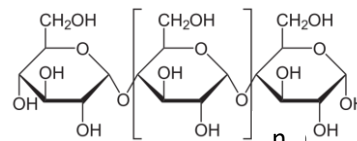
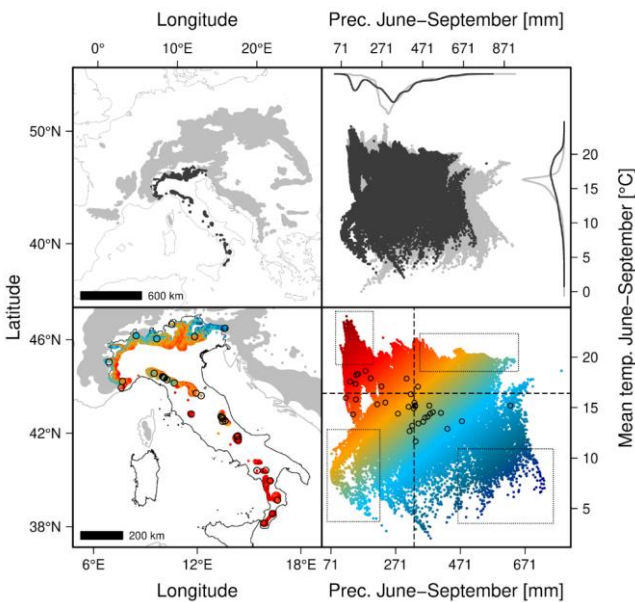


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REACT aims at revealing the phenotypic and genomic signature of *Abies alba* adaptation and resistance against climate-related stressful conditions. REACT focus on a thorough sampling of 60 silver fir natural populations, both large and relic, across Italy. We apply an individual targeted genotyping and in-depth dendrophenotyping by the analysis of wood anatomical traits and non-structural carbohydrate content. The project aims at obtaining a subset of populations exposed to a wide range of climatic stressors, characterized by phenotypic and genotypic information merged at the individual tree level. This set of information will be used at revealing the genomic signature underlying both complex phenotypic traits with adaptive value and responses to single events that can permit *A. alba* to withstand climatic constraints.



Derived variables
 $CWT_{\text{all}} = CWT_{\text{tangential}} + CWT_{\text{radial}}$
 $CTA = LA + CWA$
 D_h (Hydraulic diameter) = according to the Hagen-Poiseuille formula
 K_h (Specific hydraulic conductivity) = $\frac{\rho \cdot LA \cdot m}{\eta \cdot \kappa}$

REACT will answer key scientific questions about the retrospective and future interactions between the genotype and climate. REACT results will also promote the conservation of forest stands and genetic resources providing useful information on populations and genotypes adapted/resilient to climatic stressors. Such knowledge will produce indicators that will stem in recommendations and guidelines for stakeholders, policy makers, and managers, as well as help selecting the best management options to cope with future climate challenges.