



TRACE 2023

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Book of Abstracts



WELCOME

Welcome to TRACE 2023, held in the University of Coimbra, Portugal, and organized by the Dendrochronological lab, MedDendro. The MedDendro lab was founded in 2005, a baby compared with the age of the University of Coimbra, founded in 1290. The MedDendro lab has several research lines, from studying the climate-growth relations of Mediterranean tree species, to the ecological meaning of intra-annual density fluctuations, xylogensis of conifers, impact of drought on the physiology and growth of trees, and more recently, on archaeological and historical woods.

Associated with the celebration of the 250 years of the Botanical Garden of the University of Coimbra, the MedDendro lab prepared an exhibition about wood anatomy, called INSIDE OUT, that you can visit during the TRACE conference.

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Heading for a fall: predisposition of beech trees to windthrow is detectable in their growth pattern.

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Common beech (*Fagus sylvatica*) is one of the most important deciduous tree species in European forests and is by nature the dominant tree species in most of Western and central Europe. However, according to both empirical and modeling work, climate-change-induced drought may threaten the dominant position of beech, especially in central and southern Europe. The largest beech trees in the world can be found in the Sonian Forest, a UNESCO World Heritage site close to Brussels (Belgium). This site is famous for its high density of very large beech trees thanks to past management, climatic suitability, and unique soil. This soil could be a mitigating factor for some of the negative effects of climate change. Here we investigate the growth of beech using increment cores. Tree ring data was used to evaluate growth trends, response to climate, and the effect of mast years. By sampling 39 living and 16 recently wind-thrown trees, the link between windthrow and precedent growth could be assessed. We found that recently wind-thrown trees, showed a significantly lower growth rate compared to living trees, this difference is already discernible since the 1970s. Although we found differences in growth rate, the wind-thrown trees did not react differently to droughts, heatwaves, or mast years when looking at inter-annual growth changes. All trees were generally sensitive to droughts in spring and summer but recovered promptly after such an extreme climatic event. The overall growth rate trend for the living trees shows a slight decline over the last 50 years, after a peak in the 1970s, but is still in line with growth rates before that time. Notwithstanding the recent increase in extreme climatic events, these old trees still show good resilience, recovery, and a high general growth rate. These results may contribute to the debate on the uncertain future of beech in Europe within the context of global change.