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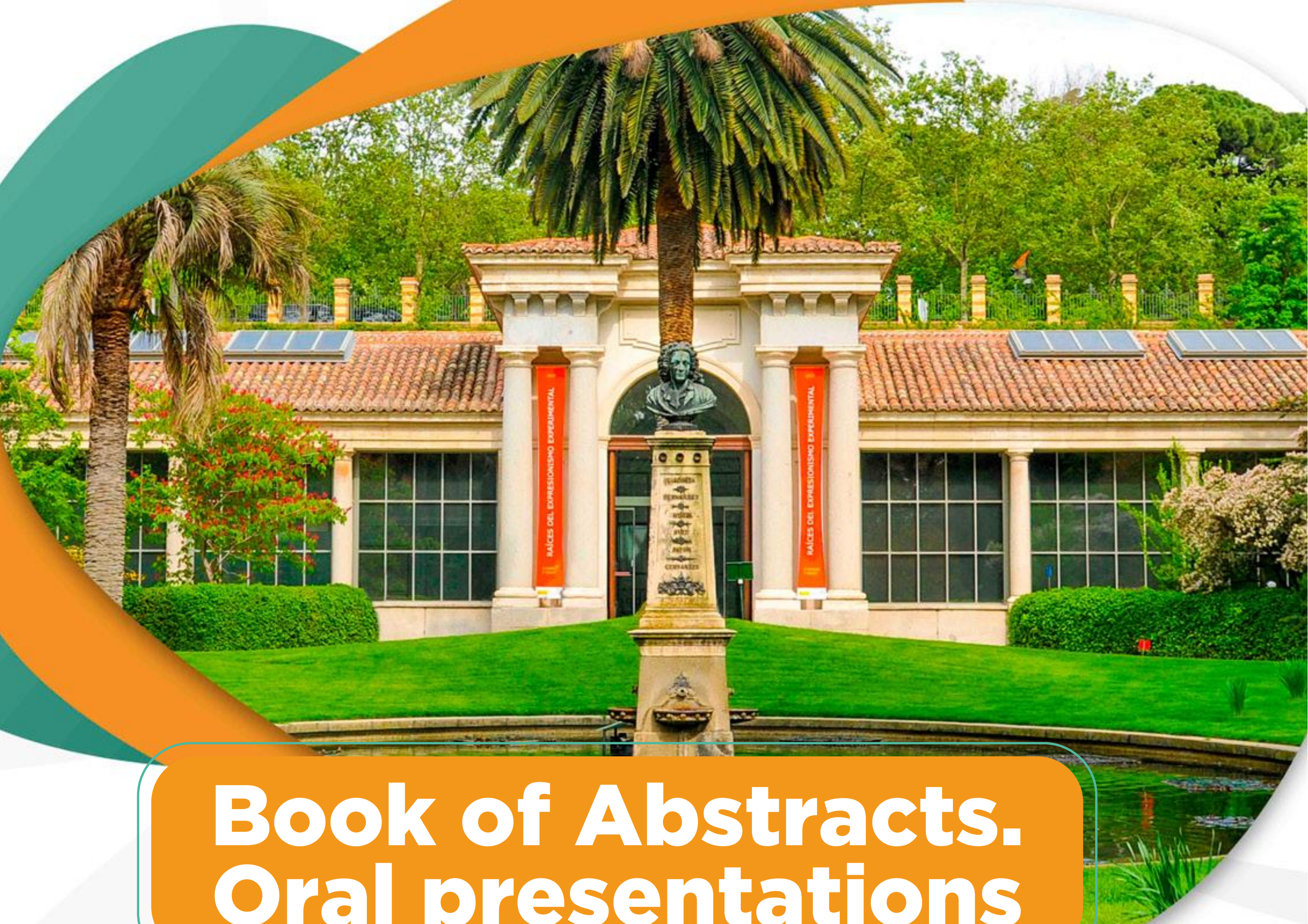

Book of Abstracts. Oral presentations

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S.251 ECOPHYSIOLOGICAL CHALLENGES IN THE ANTHROPOCENE. SESSION 2.

S.251.1 Functional traits and soil water availability shape competitive interactions in a diploid-polyploid complex

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Although polyploid species become successfully established in the short term, only a few persist in the long term. Interaction between polyploids with their ancestral cytotypes in secondary contact zones can contribute to these extinctions. Environmental factors as water availability and functional trait divergence may influence this competitive interaction.We conducted a greenhouse competition experiment with four cytotypes (2x, 4x, 6x, and 12x) of Dianthus broteri under two contrasting water regimes. We estimated niche and fitness differences and predicted the pairwise competitive outcomes. Additionally, we explored the influence of functional traits (SLA, AN, Fv/Fm, and iWUE) on competitive interactions. Water availability modified the competitive dynamics between cytotypes and predicted competitive exclusion. Under high water availability, cytotypes with lower ploidy levels (2x and specially 4x) exhibited the greatest competitive abilities while under low water availability, the higher level cytotypes (12x, 6x) overcompeted. These differences in competitive outcomes were explained by functional traits related to competitive effects (SLA) and competition tolerance (AN, Fv/Fm, and iWUE). Our study emphasizes that the long-term fate of polyploids largely depends on water availability, with polyploids having a competitive advantage in arid environments and highlighting the role of functional traits in shaping the competitive dynamics between cytotypes.

S.251.2 Inter- and intraspecific variability in leaf minimum conductance (gmin) in vascular plant species across five biomes

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Leaf minimum conductance (g_{min}) represents the vapor diffusion conductance through the surface with closed stomata, encompassing cuticle and "leaky" stomata. It stands as a critical functional trait defining the dehydration rate after stomatal closure and its capacity to overcome long-lasting droughts and heatwaves. While other traits related to drought resistance (e.g., wilting point, embolism vulnerability) are known to vary with climate, the climate-dependent variation in g_{min} remains poorly understood, despite being recognized to display significant interspecific variability and plasticity to growth conditions. Our study encompasses a diverse array of over 300 species growing under natural conditions, including angiosperms, gymnosperms and pteridophytes, as well as various growth forms—from trees to herbs—and leaf habits. To capture the interspecific variability and plasticity in g_{min}, we sampled plants from more than 50 locations spanning a steep mean annual temperature and precipitation gradient in Europe, ranging from 2.4 to 19.6 °C, and 250 to 2200 mm, respectively. Sampling was conducted on current-year, sun-adapted leaves during the summer of 2023. Measurements also included leaf dimensions, stomata distribution, trichome presence, and leaf dry mass per area. This broad sampling allows to explore the extent of g_{min} variability and its potential correlations with climatic conditions across five biomes in a large spectrum of plant diversity. In order to explore intraspecific variability, we selected four widely distributed species representing different ecological strategies—*Quercus ilex* (evergreen angiosperm), *Ailanthus altissima* (deciduous angiosperm), *Pinus halepensis* (evergreen gymnosperm), and *Pteridium aquilinum* (fern)— and measured them in over 10 locations. Results showed a strong intra- and inter-specific variability in g_{min}, as well as significant plasticity. This study provides valuable insights into the adaptive responses of plants to climate, enhancing our understanding of the functional significance of g_{min} in the context of climate change adaptation.

S.251.3 Stomata are driving the direction of carbon dioxide induced water-use efficiency gain in selected tropical trees in Fiji

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