

## P6-05 Drought tolerance of inter-provenance hybrids of *Pinus pinaster*

Raúl DE LA MATA POMBO<sup>1</sup>, Rafael ZAS<sup>1</sup> and E. MERLO<sup>2</sup>

<sup>1</sup>Misión Biológica de Galicia. CSIC. Apdo. 28, 36080, Pontevedra, Spain,  
[delamatapombo@yahoo.es](mailto:delamatapombo@yahoo.es), [rzas@mbg.cesga.es](mailto:rzas@mbg.cesga.es)

<sup>2</sup>CIS-Madeira. Avda. de Galicia, n° 5, Parque Tecnológico de Galicia, 32901, San Cibrao das Viñas, Ourense, Spain, [emerlo@cismadeira.com](mailto:emerlo@cismadeira.com)

The study of phenotypic plasticity of forest tree species to water availability and drought has become a very relevant issue to understand how forests will be able to adapt to rapid climate changes in Mediterranean areas. Maritime pine populations are known to largely vary in their tolerance to drought. In Galicia (NW Spain), maritime pine occurs both in the Coast under favourable Atlantic climatic conditions and in the interior region where the Mediterranean influence led to intense summer droughts and large intra-annual temperature oscillation.

Within the frame of the Galician *Pinus pinaster* breeding program, inter-population hybrids between Coastal improved materials and drought-tolerant populations were generated to provide new breeding materials better adapted to the extreme environmental conditions of the Interior area of Galicia. The aim of the present study is to explore the variability in drought tolerance between these synthetic hybrids and the respective parental populations.

One year old cuttings of hybrids between selected genotypes of the Galicia-Coast breeding population and Galicia-Interior, Corcega, Soria-Burgos and Landas provenances and their respective natural populations were grown in the greenhouse under two watering regimes (well-watered and drought). Biomass partitioning and morphology of the root system were analyzed six months after starting treatment.

The watering regime did not affect the architecture of the root system, neither the proportion of fine roots, but seedlings grown under drought conditions were smaller, showed increased allocation of biomass to needles, and tend to have less coarse roots. On the other hand, survival and biomass allocation patterns significantly differ among the studied populations, with hybrids showing intermediate values regarding the parental populations.

We discuss how these resource allocation patterns may be part of drought tolerance strategies, how these strategies are inherited when two contrasting origins are crossed, and whether synthetic hybrids can be useful to achieve new base material within the Galician breeding program.

**Keywords:** Genetics and breeding, inter-population hybrids, drought tolerance, dry matter allocation, *Pinus pinaster*

