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Drought-induced acclimation of RNAi poplar lines modified for their DNA methylation

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Abstract:

Recent findings suggest that epigenetic processes such as DNA methylation are involved in water-stress acclimation. Poplars are increasingly used for tree research as model organisms and poplar RNAi lines represent powerful tools to address physiological questions. Here, three RNAi poplar lines inhibited for the *DECREASED DNA METHYLATION 1* gene (*DDMI*, involved in the maintenance of DNA methylation profile) were compared to the control genotype (*Populus tremula* × *Populus alba*). A drought-rewatering experiment was conducted to evaluate the role of DNA methylation in phenotypic plasticity. *In vitro* plantlets of the four genotypes were propagated and transferred to a greenhouse where they were grown under controlled conditions of temperature, light and photoperiod. At the onset of the drought experiment, half of the plants were subjected to a controlled and moderate water deficit while the other half was maintained at field capacity. After three weeks of water depletion, water-stressed plants were re-watered for one week before being harvested. Results related to growth behaviour, photosynthetic capacities, water-use efficiency, xylem vulnerability to cavitation and xylem anatomy will be presented. This phenotypic characterization will drive future work in epigenomic such as the identification of 'Differentially Methylated Regions' and their relationships with corresponding gene expression profiles.