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Plant GEM Istanbul 2011 Plant Genomics European Meetings

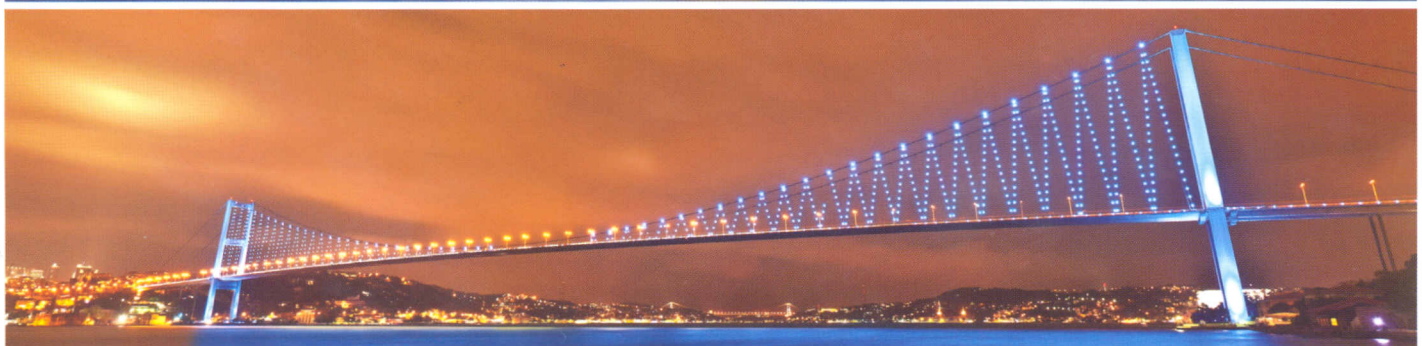
Istanbul



The Plant Genomics European Meeting (Plant GEM) meets global challenges.



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ABSTRACT BOOK



P03

DROUGHT STRESS TOLERANCE IN TWO JATROPHA CURCAS ECOTYPES**Helena SAPETA¹, Tiago CRUZ¹, Tiago LOURENÇO¹, J. Miguel COSTA², Piet VAN DER LINDE³, M. Margarida OLIVEIRA¹**¹ *Genomics of Plant Stress lab, ITQB and IBET*² *Plant Molecular Ecophysiology lab, ITQB*³ *Quinvita*

Species better adapted to extreme environmental conditions may help to unveil new tolerance mechanisms to transfer to specific crops. *Jatropha curcas* is quite well adapted to drought conditions and to poor soils, although its major interest relies on the quality of its oil-seed for biofuel production. Aiming to understand *J. curcas* tolerance to water-limiting conditions we are following physiological and molecular approaches to characterise the behaviour of two different ecotypes (adapted to arid or to wet tropical regions) when submitted to drought stress. Seeds from both ecotypes were germinated in a growth chamber with controlled conditions, for stress application and periodic analyses. At the physiological level we have monitored leaf gas exchange, water relationships and growth under water deficit and during recovery. To gain insight into the molecular mechanism of drought tolerance in *J. curcas*, putative key genes were targeted. In a first approach, target candidates described as involved in drought tolerance (regulating gene expression, osmolyte accumulation and signal transduction) were selected from heterologous species. Fragments of *Jatropha* homologous genes were obtained (300-600bp), sequenced, confirmed for homology, and extended by RACE-PCR. When targeting specific *Jatropha* sequences, specific primers were designed and used in expression analyses along the drought-stress period. Preliminary experiments suggest that the two ecotypes use discriminating strategies to cope with water stress, especially after re-hydration. The changes observed in the gene expression profiles of the target genes are not enough to justify the different plant behaviour. New experiments are being conducted using longer stress and recovery periods. The new data is providing a more clear idea of the most important time points for RNA collection, aiming to identify genes differentially expressed in the two ecotypes and putatively responsible for the differential adaptation.

P04

CHARACTERIZATION OF THE NITROSATIVE STATUS OF CITRUS PLANTS UNDER VARIOUS ABIOTIC STRESS CONDITIONS**Vasileios ZIOGAS¹, Georgia TANOU¹, Panagiota FILIPPOU², Grigoris DIAMANTIDIS¹, Vasileios FOTOPOULOS², Athanassios MOLASSIOTIS¹**¹ *Faculty of Agriculture, Aristotle University of Thessaloniki*² *Department of Agricultural Sciences, Biotechnology and Food Science, Cyprus University of Technology*

Nitric oxide (NO) is a key signaling molecule in plants. However, little is known about the metabolism of endogenous NO in plants under abiotic stress conditions. Using citrus plants (*Citrus aurantium* L.) exposed to six different abiotic stress conditions (high light intensity, continuous dark, low and high temperature, drought and salinity), several aspects of the NO-related metabolism were investigated. Abiotic stress treatments induced the de novo production of NO in the leaves of plants, particularly in the case of high temperature and high light conditions. Increased NO production was localized in different leaf tissues by confocal laser scanning microscopy using the fluorescent probe 4,5-diaminofluorescein diacetate. Salinity and drought resulted in strong nitrosative DNA damage induced by peroxynitrite, further indicating that abiotic stress situations elicited nitrosative challenges in citrus plants. S-nitroso glutathione reductase (GSNOR) appeared to play a signaling role in the high light, dark and high temperature responses. Protein Tyr-nitration targets were also characterized in leaves of citrus subjected to abiotic stress. Gene expression profiling experiments revealed that a wide array of NO-associated genes in citrus plants (including AOX, XO, GSNO, NOS, NiR and NR) were regulated by abiotic stress conditions. These results indicate that nitrosative responses are key components in the plant's behavior against environmental stimuli and provide further insights into NO-mediated signaling.