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Abstract – SY37

TRANSCRIPTOME PROFILING VIA RNASEQ INDICATES GLYCOLYSIS AND KREBS CYCLES AS STRONGLY INDUCED PATHWAYS IN GIANT REED (*ARUNDO DONAX*) UNDER LONG TERM SALT STRESS

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Giant reed (*Arundo donax* L) is a fast-growing herbaceous non-food crop considered as eligible alternative, more sustainable energy source. Tolerance of this plant to abiotic stresses has been demonstrated across a range of stressful conditions, including salty soils occurring frequently in the Mediterranean basin. A deep knowledge of the global transcriptomic response of different giant reed ecotypes to salt is needed as it might lead to the discovery of still unidentified candidate genes to employ in genome editing experiments. For this reason, we analyzed the transcriptomic response of an *A. donax* L. low ecotype (namely G34) to long-term severe salt stress (256.67 mM NaCl corresponding to 32 dS m-1) through the de novo sequencing and assembling of the leaf transcriptome via RNA-seq. The analysis of differently expressed genes revealed that transcription of clusters related to ethylene biosynthesis and signaling is modulated towards the minimization of ethylene negative effects upon plant growth in treated plants. Certainly, the photosynthesis is strongly affected by salinity since genes involved in Rubisco biosynthesis and assembly are down-regulated. However, a shift towards C4 pathway is likely to occur as gene regulation is aimed to activate the primary CO2 fixation to PEP (phosphoenolpyruvate).The analysis of "carbon metabolism" category revealed an induction of the expression of glycolysis and Krebs cycle related genes. The induction of genes such as citrate synthase, isocitrate dehydrogenase, fumarase and succinate dehydrogenase was observed, all these pathways being triggered in salt resistant plant (Zhong et al., Plant Growth Regul, 79, 2016). As these results are achieved at salt concentration lower than that needed to gain the same response in other giant reed ecotype (Sicilia et al., BMC Plant Biology, 19, 2019), they are consistent with the hypothesis that some sort of salt avoidance might be occurred in A. donax G34 low ecotype. Consequently, heritable phenotypic differences among ecotypes of A. donax might be accumulated, despite their asexual reproduction modality. This study sheds new light on the salt stress mechanisms laying the basis to select candidate genes in order to improve photosynthesis efficiency and salt tolerance.