TRANSCRIPTOMIC ANALYSIS OF TWO *Prunus* GENOTYPES DIFFERING IN WATERLOGGING RESPONSE REVEALS THE IMPORTANCE OF ANP AND HYPOXIA-ASSOCIATED OXIDATIVE RESPONSE

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Plant breeding in stone-fruit trees is mainly focused to increase rootstock tolerance to abiotic stress. The molecular response program to hypoxia caused by waterlogging involves many genes, and at least 20 anaerobic polypeptides (ANPs) have been described in different sugar metabolism pathways. Experiments carried out to unravel transcriptional regulation in response to hypoxia treatment of two *Prunus* rootstocks will be presented. *In vitro* plants were submitted to hipoxia and normoxia conditions. The hypoxic treatment was carried out in airtight chambers with 3% O_2, 0.03% CO_2 and 97% N_2 gas composition for 2 h and 24 h. For each experimental pint (0, 2h and 24 h) a sample representing three sets of roots were taken for each genotype. A ChillPeachmicroarray representing 4261 peach unigeneswas hybridized with cDNA from root tissues of Myrobalan 'P.2175' *(P. cerasifera)* and 'Felinem' hybrid *(P. amygdalus x P. persica)*, these corresponding to waterlogging-tolerant and sensitive plants respectively. A SAM multiclass analysis of the gene expression dataset was used to analyse globally the effect of hypoxia over treated roots compared to control roots at different times. A total of 2442 genes were found differentially expressed. Out of them, 916 genes show already differences in expression levels between genotypes at time 0 with 434 of those being more highly expressed in the tolerant genotype. A hierarchical clustering analysis revealed a number of genes encoding ANPs, as well as genes previously reported as induced by H_2O_2, and suggest a possible crosstalk between the signaling pathways for hypoxia and oxidative stress. Among the ANPs the one encoding an Alanine Aminotransferase seems to play even a more important role than other important players such as Alcohol Dehydrogenase and Pyruvate Decarboxilase in terms of energy production as it would prevent the accumulation of Pyruvate. Among the antioxidants enzymes differences has been found in the activities in different cell compartments, chloroplast, mitochondrial, etc.