Waterlogging-induced changes in fermentative metabolism of root soybean

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Molecular oxygen plays a primordial role in plant growth metabolism, and its privation constitutes a highly stressful condition causing a decrease in oxidative phosphorylation that leads to a fermentative activation and a consequent relative increase in ATP production by cytosolic glycolysis. This study evaluated fermentative metabolism in roots of two soybean genotypes under hypoxic and post-hypoxic conditions. Nodulated plants (genotypes Fundacep 53 RR and BRS Macota) were grown in vermiculite and transferred to hydroponic system at reproductive stage. Root system was submitted to hypoxia by flowing nitrogen gas in the solution for 24 and 72 h. For recovery, after 72 h plants returned to normoxia condition by transferring back to vermiculite for 24 and 72 h. Fermentative enzyme activities and anaerobic metabolites were quantified in roots. The activity of alcohol dehydrogenase, pyruvate decarboxylase and lactate dehydrogenase enzymes, as well as the content of ethanol and lactate, increased under hypoxia and returned to pre-hypoxic levels after 72h recovering, in both genotypes. On the other hand, pyruvate content decreased under hypoxia. Fundacep 53 RR was more responsive in activating the fermentation metabolism under hypoxia and post-hypoxia, and it is likely that these characteristics contribute to improve adaptations to the oxygen deficiency.

Resúmenes (índice)
Índice de resúmenes de trabajos presentados en el XV Congreso Latinoamericano de Fisiología Vegetal – XXX Reunión Argentina de Fisiología Vegetal- Mar Del Plata, 2014.

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