Poster: Environmental Stress and Adaptation to Stress: Nutrient

Abs # P12019: Altered nitrogen and phosphorus root growth response in arabidopsis *pdr23* mutants

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Changes in root architecture are an important adaptive strategy used by plants in response to limited nutrient availability to increase the odds of acquiring them. The mechanisms of cellular division in the roots plays a role in altering the root growth over different media. The arabidopsis mutant *pdr23* presents primary short root when compared to its wild-type ecotype Columbia (col), and it was identified as a mutant unable to grow using nucleic acids as the only source of phosphorus(P). In this study the effect of the *pdr23* mutation on cytokinin response, cell division and root architecture in response to P and nitrogen (N) is evaluated. The mutant shows a stronger response to P starvation, having changes in the root architecture, such as earlier loss of quiescent center (QC) identity, lower rate of cell division and production of root hairs nearer the meristem. The removal of N from the media rescues the mutant. On the other hand, loss of QC identity under N starvation was observed in both genotypes, but earlier in the mutant primary roots, associating both stresses to the same mutation. It is also observed that in presence of high P and N there is no effect of cytokinin in the mutant, but in absence of N, there is a negative response in root growth, similar to wild-type. The data suggest that the mutation affects a gene involved either in the crosstalk between these nutrients or in a pathway shared by both nutrients limitation response.