



Plant & Animal Genomes XIX Conference

January 15-19, 2011
Town & Country Convention Center
San Diego, CA

P478: Fruit Trees

Large Changes In Anatomy And Physiology Between Diploid Rangpur Lime (*Citrus limonia*) And Its Autotetraploid Are Not Associated With Large Changes In Leaf Gene Expression

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Polyploid genotypes present a specific anatomy and morphology compared to diploid (2x) which should have a huge impact on plant physiology. We investigated the anatomy and morphology of root and leaf of 2x and autotetraploid (4x) Rangpur lime (*Citrus limonia*) seedlings grown in control condition. 4x line arose from chromosome doubling in nucellar cells of 2x Rangpur lime and has strictly the same allelic composition than the 2x one. In 4x, roots and leaves were thicker and the cell size was bigger than in 2x. Leaf stomatal conductance of 4x was lower than for 2x which could explain the smaller growth rate of 4x. Using 20 K cDNA microarrays, leaf gene expression was investigated in both genotypes. A very limited number of genes were significantly differentially expressed in both genotypes (< 1%) suggesting that subtle changes in gene expression may be at the origin of the phenotypic differentiation of 4x citrus leaves when compared to 2x. However, investigation of candidate genes expression using qRT-PCR in roots showed that 4x Rangpur lime experienced an enhanced expression of genes involved in water deficit adaptation compared to 2x. Taking together, these results suggest that genes expression in 4x

Rangpur lime is organ specific and may lead to a better adaptation to drought.