Characterization of Bud Sport Mutation in Plum Fruit: Physiological, Biochemical and Molecular approaches

Ho-Youn Kim, Macarena Farcuh, Carlos Crisosto, Eduardo Blumwald
jsakim@ucdavis.edu

We count with an experimental system composed of two commercial Japanese plum cultivars that present the same genetic background but differ in a spontaneous, naturally occurring mutation that classifies them as 'sports'. One cultivar corresponds to the wild type (WT) and the other one to the 'sport' (SBM). We have characterized both cultivars physico-chemically, enzymatically as well as by using a System Biology approach throughout different developmental stages of fruit growth (during fruit division, at fruit mature stage and at fruit ripe stage).

Our results have shown that both cultivars differ in ripening behaviors (WT behaves as climacteric while SBM behaves as non-climacteric), in sugar metabolism (assaying enzymatic activities and sugar contents we have observed that WT presents a sucrose-based metabolism while SBM presents a sorbitol-based metabolism) as well as in ripening-related changes (physico-chemical measurements have shown that the WT presents lower firmness, lower soluble solids content, lower pH and lower skin and flesh hue values than the SBM, but higher acidity, respiration rates and ethylene production rates than the SBM).

Using this experimental system we want to know if there is an interaction between sugar metabolism and the fruit ripening process as well as what are the factors that are involved in the regulation of sugar metabolism.