Fruit Ripening – A developmental event driven by hydration stress.

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Fruit ripening, a genetically programmed event is perceived as a stress adaptation phenomenon. Our studies revealed that stress conditions might be evoked by an autonomously induced decrease in tissue water status. The decline in tissue water content strongly correlated with a decrease in hydration (swelling) efficacy of cell wall preparations suggesting that hydration dynamics of cell walls might account for changes in tissue moisture content. Extent of cell wall swelling was, in turn, related to the degree of oxidative cross-linking of wall-bound phenolic acids, suggesting that oxidant-induced wall restructuring might mediate cell wall and fruit tissue hydration status and might consequently evoke stress signaling for the onset of ripening processes. This phenomenon might have implications in mammalian aging. Future studies will explore the hypothesis that perturbations in cell wall integrity lead to cell wall remodeling, which instigate stress and consequent expression of fruit ripening transcriptional program.