

Postharvest water stress leading to peel disorders in citrus fruit involves regulation of phospholipases by ABA

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Abstract

The interplay between abscisic acid (ABA) and phospholipases A2 and D (PLA₂ and PLD) in the response of citrus fruit to water stress was investigated during postharvest storage using 'Navelate' orange and its ABA-deficient mutant 'Pinalate'. Fruits from both varieties were subjected to prolonged water stress conditions inducing non-chilling peel pitting in the rind. Treatment with phospholipase inhibitors reduced the disorder in both varieties suggesting that phospholipid metabolism is involved in citrus peel quality. Expression of genes encoding PLA₂ and PLD was studied by real time RT-PCR during water stress and in response to ABA. Expression of *CssPLA2α* was dependant on ABA in fruit from both varieties, since ABA application restored expression in the mutant, showing for the first time the involvement of this hormone in the activation of PLA₂. *CsPLDα* expression increased with dehydration in mature-green fruit from 'Navelate' but not from 'Pinalate', and ABA did not counteract this effect. Together, results show that susceptibility to stem-end rind breakdown (SERB) and regulation of phospholipase gene expression varies with maturation and that ABA action is upstream phospholipase activation in response to water stress.