

THE INVOLVEMENT OF THE AEC MULTIGENE FAMILY DURING APPLE FRUITLET ABSCISSION

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Throughout development, plants shed entire organ systems through the process referred to as abscission which provides a mechanism for the removal of senescing or otherwise damaged organs and for the release of fruit as it ripens. Many fruit tree species bear an abundance of flowers which may produce a surplus of fruit that trees are unable to support. *Malus X domestica* L. Borkh, like many other fruit tree species, has developed a self regulatory-mechanism whereby it sheds part of the fruit load at an early fruit development period. For many years it has recognized that the balance between the plant hormones ethylene and auxin has an important role in the regulation of the abscission process.

Several auxin efflux carriers (PINs) and auxin responding transcription regulators (Aux/IAA) partial clones were isolated from immature apple fruit along abscission induction. The clones encode proteins with a high level of similarity, indicating the presence of several members belonging to big gene families. In the case of PINs, two of the clones, likely to be orthologues to AtPIN1, were named MdPIN1 and MdPIN10, and were characterized by 98% amino acid identity. The isolation of the genomic clones and the analysis of the introns indicated the presence of two MdPIN10 alleles, these findings were further supported by the corresponding cDNA clones. The expression analysis performed on different tissues indicated a differential pattern of transcript accumulation suggesting that MdPIN1 and MdPIN10 are likely to be paralogous. The other PINs clones, according to the highest level of similarity to AtPINs were named MdPIN4 and MdPIN7, the latter one displaying two allelic forms. Concerning Aux/IAA clones, blastX analysis indicated high level of similarity with AtIAA3, AtIAA7, AtIAA8, AtIAA16 and AtIAA27. The transcript amount of these clones was exploited as an indicator to assess the level of auxin during abscission in seed, cortex, peduncle and abscission zones of apple fruitlet. The data indicated a differential expression of both PIN and Aux/IAA clones depending on both tissue and abscission magnitude of the fruitlet population.