

Title Identification and genetic characterization of an ethylene-dependent polygalacturonase from apricot fruit

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Abstract

During fruit ripening a loss of firmness occurs, which is a key factor limiting postharvest life. In apricot, *Prunus armeniaca* L., a wide range of fruit firmness at commercial maturity has been observed in different cultivars. Endopolygalacturonase (endoPG) activity has been reported to be associated with differences in firmness in many fruit species, but never in apricot. In this paper, we reported the identification of an apricot cDNA (*PaPG*) coding for an endoPG-like protein with 393 amino acids. Protein sequence comparison with known polygalacturonases (PGs) revealed that multiple features as conserved domains and functional residues and a predicted signal peptide were present in PaPG. Moreover, a phylogenetic analysis of this and other plant PGs placed PaPG into a clade containing endoPGs expressed in fruit, abscission and dehiscence zones without a propeptide sequence, very close to PRF5 from peach (*Prunus persica* L. Batsch). *PaPG* gene expression increased during postharvest storage of the fruit, correlating with fruit softening and ethylene release, and it responded to exogenous ethylene treatments. We localized the *PaPG* gene in apricot linkage group 4 after genetic mapping based on SNP analysis, in a position apparently syntenic to the *PRF5* locus from peach. Results obtained offer genetic evidence supporting the hypothesis that *PaPG* and *PRF5* are orthologous genes, and consequently position *PaPG* as a gene of interest for studies on fruit softening in apricot, and contribute to the development of molecular tools for breeding apricots with longer shelf life.