

TACKLING THE GRAPEVINE PECTATE LYASE GENE FAMILY AND ITS ROLE IN THE BERRY TEXTURE DETERMINATION

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Grapevine (*Vitis vinifera* L.) is one of the most commercially valuable fruit trees worldwide. Table grapes represent an important economic sector, where consumers highly appreciate the berry firmness trait. Although several studies have addressed the key role of the cell wall in fruit firmness, the main players among cell wall degrading enzymes during fruit ripening are still unclear. This work characterizes the grapevine Pectate Lyase (*VvPL*) gene family which catalyses the eliminative cleavage of de-esterified pectin during the berry development. Using the latest grapevine genome assembly and annotation, 17 members of the family containing the PL domain were identified. To identify the *VvPL* members most involved in pectin degradation during fruit softening, an in-silico analysis in Expression Atlas and in public RNA-Seq repositories was performed. Additionally, gene expression of the *VvPL* genes was evaluated in table grape varieties showing contrasting texture profiles. Our results demonstrated that specific *VvPL* genes were up-regulated in the softer variety compared to the firmer one, suggesting their active role in the softening process during berry development. Furthermore, two *VvPL* genes were selected for functional characterization via genome editing with CRISPR/Cas9 technology in the table grape variety 'Sugraone'.