

**Title** Cell wall modifications in chilling-injured plum fruit (*Prunus salicina*)  
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### Abstract

The aim of this study was to analyze the changes in cell wall pectins in normally ripening (juicy) and in chilling-injured plum fruit (*Prunus salicina* cv. Fortune) showing mealiness. Total cell wall neutral sugars and uronic acids, solubilization and depolymerization of pectins in water-, CDTA- and Na<sub>2</sub>CO<sub>3</sub>-soluble fractions of the cell wall (WSF, CSF and NSF, respectively), non-cellulosic neutral sugar compositions of these fractions, and the activities of the cell wall-degrading enzymes polygalacturonase (PG), pectin methylesterase (PME), 1,4- $\beta$ -d-glucanase/glucosidase and  $\beta$ -galactosidase ( $\beta$ -gal) were determined. No differences in the total content of pectin and neutral sugars between normally ripening and chilling-injured fruit were detected. However, the mealy plums presented a higher level of tightly bound pectin (NSF) and a lower proportion of loosely bound pectin (WSF) than the juicy controls. Lower pectin depolymerization and reduced solubilization of neutral sugars in the WSF and CSF were also detected in the chilling-injured tissues, confirming an alteration in the normal ripening-associated pattern of polyuronide disassembly. While no differences were found in the activities of PG, PME and 1,4- $\beta$ -d-glucanase/glucosidase between normally ripening and mealy fruit, the latter had reduced  $\beta$ -gal activity. This might have led to differential solubilization of polymers with galactan side chains, but further studies are required to determine if there is a causal relationship between these events. Overall, results indicated that the development of chilling injury symptoms in 'Fortune' plums is associated with abnormalities in cell wall metabolism, including a reduction in pectin solubilization and depolymerization and decreased ripening-associated modification of galactose-rich pectin polymers.