Title Temporal and spatial distribution of cell wall pectic polysaccharides associated with floral organ abscission in poinsettia (*Euphorbia pulcherrima*)

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Abstract

Abscission is an important developmental process in the plant, regulating detachment of organs from the main body of the plant. The crucial step in abscission is the breakdown of the middle lamella between cells in the abscission zone (AZ). Prior to abscission, it was known that the levels of insoluble wall pectins decreased and lignin increased. This led to the hypothesis that pectins are degraded and their bonds with other molecules cleaved by hydrolytic enzymes. Pectin is a major component of primary cell walls of all land plants. We studied the possible involvement of several pectin epitopes in abscission in abscission zone (AZ) and adjacent cells of *Euphorbia pulcherrima* using immuno-labelling with monoclonal antibodies (Mabs). The Mabs have been used to locate pectin epitopes on longitudinal sections of chemically fixed and resin-embedded poinsettia flowers (Cyathia). The Mabs LM5 recognizes (1-4)-b-D-galactan, while LM6 recognizes (1-5)-a-L-arabinan. The Mabs JIM5 and JIM 7 recognized epitopes of unesterified and methylesterified homogalacturonan, respectively. Usually, the AZ is visible 5 days (D5) after induction by decapitating the flower bud and the whole pedicel abscises after 7-10 days. The pectic epitopes were evenly distributed in the control cell wall and cell junction. During abscission process, these epitopes were decreased or absent in the AZ and distal area while proximal area had no change in D5. These changes were remarkable in day 7 (D7), means distinct temporal differences in their distribution. Through this study, we found that the distribution of cell wall pectic olysaccharides was spatially and temporally controlled during abscission process. Decreases of LM5, LM6, and JIM7 epitopes in AZ indicate the enzymatic action and high expression of JIM5 in AZ explained the cell walls were de-esterified.