

Kanokporn Bunya-atichart 2007: Role of Cell Wall Hydrolases and Gene Expression in Abscission of *Dendrobium* Flower Buds in Response to Ethylene. Doctor of Philosophy (Postharvest Technology), Major Field: Postharvest Technology, Interdisciplinary Graduate Program. Thesis Advisor: Professor Saichol Ketsa, Ph.D.  
105 pages

Inflorescences of *Dendrobium* orchid cultivars 'Miss Teen', 'Willie', 'Wanna', 'Lina', 'Yellow River', 'Pompadour' and 'Sonia' treated with  $0.4 \mu\text{L L}^{-1}$  ethylene for 24 hours at  $25^{\circ}\text{C}$  showed differently abscission of flower buds and open flowers. Flower buds of 'Miss Teen' were more sensitive to ethylene than that of 'Yellow River'. Exogenous ethylene induced an abscission of only flower buds in 'Miss Teen' whereas exogenous ethylene induced an abscission of both flower buds and open flowers in 'Yellow River'. 1-Methylcyclopropene (1-MCP) completely inhibited an abscission of 'Miss Teen' flower buds induced by ethylene treatment.  $\beta$ -1,4-Glucanase (cellulase) and polygalacturonase (PG) activities increased considerably in abscission zone (AZ) of both flower buds and open flowers of 'Miss Teen' after ethylene treatment whereas 1-MCP treatment reduced activities of both cellulase and PG. However, pectin methylesterase (PME) activity remained unchanged. While  $\beta$ -1,4-glucanase, PG, and PME activities in AZ of both flower buds and open flowers of 'Yellow River' remained relatively unchanged. Accumulation of  $\beta$ -1,4-glucanase (*Den-Cel*) mRNA was abundant in AZ of flower buds of both 'Miss Teen' and 'Yellow River' with and without ethylene treatment. Expression of *Den-Cel* gene in ethylene-treated AZ was greater than that of untreated AZ. Moreover, expression of *Den-Cel* gene in ethylene-treated AZ of 'Miss Teen' was greater than that of 'Yellow River'.

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