

**Title** Ethylene-sensitive and ethylene-insensitive abscission in *Dendrobium*: Correlation with polygalacturonase activity

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#### **Abstract**

We previously showed that the abscission of floral buds of the orchid *Dendrobium* cv. Miss Teen was absent in controls but highly promoted by ethylene, whilst open flowers also did not abscise without ethylene but were not responsive to ethylene. Here, we determined the activities of three enzymes in the abscission zone (AZ): polygalacturonase (PG),  $\beta$ -1,4-glucanase (cellulase), and pectin methylesterase (PME). In the AZ of floral buds an increase in PG activity coincided with the ethylene-induced abscission. A small increase was found in the AZ  $\beta$ -1,4-glucanase (cellulase) activity, shortly after the end of ethylene treatment of the flower buds and a few days before the onset of abscission. The activity of pectin methylesterase (PME) in the AZ of floral buds was not affected by ethylene. In the AZ of flowers that had just opened no increase in enzyme activity was observed after ethylene treatment. The data indicate a role of PG, and possibly of  $\beta$ -1,4-glucanase, in abscission. The data also suggest that the reason for the decrease in ethylene sensitivity of the abscission zone, during flower opening, lies upstream from the induction of enzyme activity in the AZ.