

**Title** Ethylene-regulated hastening of perianth senescence after pollination in *Dendrobium* flowers is not due to an increase in perianth ethylene production

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#### **Abstract**

Flowers of *Dendrobium* cv. Kenny were hand-pollinated using pollinia from cv. Sakura. This resulted in a large increase in flower ethylene emission and rapid perianth (tepals) senescence. The increase in flower ethylene emission was correlated in time with an increase in ethylene emitted by the column (the fused stigma, style and stamens) plus the ovary. No ethylene emission was observed from perianth parts that were isolated at various periods after pollination. The increased ethylene emission by the column plus ovary was correlated with an increase in ACC synthase and ACC oxidase activity in these flower parts. The perianth parts, in contrast, only showed an increase in ACC oxidase activity, following pollination. The data show that pollination-induced early perianth senescence in *Dendrobium* is mediated by increased ethylene biosynthesis by the column + ovary, and not due to increased ethylene biosynthesis in the perianth parts. Apparently, ethylene synthesized in the gynoecium diffuses to the perianth parts where it induces senescence. The data are very similar to those found previously in pollinated *Phalaenopsis* orchids and in emasculated *Cymbidium* orchids, with the exception that ethylene was emitted from the tepals of these two orchids and not from *Dendrobium*.