

**Title** Effect of the ethylene inhibitor 1-MCP in postharvest chains of mini-*Phalaenopsis*  
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### Abstract

*Phalaenopsis* is an important ornamental plant in many countries in Europe and Asia. In Denmark more than 8 million plants were produced in 2009 of which 60-70% was mini-*Phalaenopsis*. The majority of the plants produced in Denmark are exported to other countries in Europe. Hence, the plants are subjected to long periods of transportation, typically ranging from 8-20 hours in trucks. Furthermore, it might take up to 3 days in total before the orchids reach their final destinations. The gaseous plant hormone ethylene is an important factor affecting ornamental plant quality as it accelerates senescence and causes abscission of buds and flowers. During the transportation period, plants are often subjected to several ethylene sources e.g. ripening fruits. *Phalaenopsis* is very sensitive to even low concentration (0.1  $\mu\text{L/L}$ ) of ethylene and the producers are not always aware of the goods transported alongside the orchids leading to loss of quality. In an attempt to mimic the effects of ethylene during transportation of mini-*Phalaenopsis* the two varieties SOGO 'Allen' and 'Venice' were subjected to the following combinations of 0.1  $\mu\text{L/L}$  ethylene (E) and 0.5 nL/L 1-MCP (M) for 7 days: [+E, +M same time], [+E, -M], [-E, +M], [-E, -M], [+E, +M applied 2h before] and [+E, +M applied 24h after] in sealed chambers. Ethylene treatment resulted in 100% wilted flower buds in both cultivars. In comparison, the treatment [+E, +M applied 24h after start] resulted in a significantly lower percentage of wilted buds, 7% and 18% for 'Allen' and 'Venice', respectively. Furthermore, for 'Allen', the majority of the flower buds did not wilt and did not shift color compared to the [+E, +M] treatment. Collectively, these data indicated that a postharvest treatment of 0.5 nL/L 1-MCP significantly can inhibit quality losses of mini-*Phalaenopsis*, which have been subjected to low amounts of ethylene.