

Abstract

Dendrobium orchid inflorescences are shipped by air in cardboard boxes lined with plastic. Ethylene concentrations inside the boxes temporarily rise to more than 1 microliter per liter. In most cultivars this results in abscission of both flowers and buds, and shortens the life of the remaining open flowers. Treatment of the inflorescences with 100 to 500 $\mu\text{l/l}$ 1-MCP prior to simulated air transport resulted in a longer vase life and less abscission of flower buds. It also reduced the ethylene concentration inside the boxes. In separate test it was observed that 1-MCP treatment inhibited ethylene production by lowering the 1-aminocyclopropane-1-carboxylic acid (ACC) synthase activity, ACC content and capability of ACC conversion to ethylene of both flower buds and open flowers. The effects, however, depended on the stage of bud and flower development. In flower buds, ethylene production was apparently limited by ACC oxidase activity, whereas in the older open flowers, the limiting factor was the conversion of ACC to ethylene.