

Abstract:

Carnation (*Dianthus caryophyllus* L. cv. White Candy), petunia (*Petunia hybrida* L. cv. Pink Cascade) and freesia (*Freesia refracta* cv. Athena) flowers exhibit climacteric patterns in both respiration and ethylene synthesis. Pulsing with a 20% sucrose solution at 22°C for 24 hours resulted in a marked increase in longevity and decrease in ethylene sensitivity. The uptake of sugar is age dependent and not related to a shortage in ATP. The natural increase in ethylene sensitivity during the early stages of senescence is accompanied by an increase in ethylene binding which is not caused by an increase in the expression of ETR1. Sucrose exerts its effect on ethylene sensitivity by causing a suppression of ethylene binding. In freesia, a 24-hour pulse with sucrose also resulted in a marked increase in the number of open florets in the inflorescence. Sucrose is transported along the axes from older to younger florets. The effect of sucrose on flower longevity could be ascribed to its effect on various metabolic processes rather than its effect as an osmoticum.