

Abstract

Carnation (*Dianthus caryophyllus* L. cv. White Sim) flowers were held continuously in a 0, 20, and 50 g l⁻¹ sucrose solution, or for 1 day in a 100 g l⁻¹ sucrose solution, in order to investigate the effect of carbohydrate loading on ethylene responsiveness and ethylene biosynthesis of the petals. All sucrose treatments delayed flower senescence and decreased ethylene responsiveness of the petals. The reduced ethylene production of the petals treated with sucrose, when exposed to ethylene, correlated with decreased in vitro ACC oxidase and ACC synthase activities. Significantly lower levels of the ethylene precursor ACC were observed in sucrose-treated flowers. Northern blot analysis showed that decreased ethylene biosynthesis can, at least in part, be explained by delayed ACC oxidase and ACC synthase mRNA accumulation.