

Abstract:

In senescing carnation (*Dianthus caryophyllus* L.) flowers, ethylene is produced from the gynoecium, and acts as a diffusible signal received by petals to induce the expression of 1-aminocyclopropane-1-carboxylate (ACC) synthase (DC-ACS1) and ACC oxidase (DC-ACO1) genes in the petals. This results in autocatalytic ethylene production in the petals. We investigated ethylene production in cut flowers of cv. White Candle, which produce ethylene only in trace amounts and have a long vase life. The low ethylene production in these flowers was due to low ethylene production in the gynoecium, accompanied by low accumulation of ACC synthase transcripts. These findings further support the importance of ethylene production from the gynoecium in the senescence of carnation flowers. Cv. White Candle flowers had water relations that were different from those in cv. Light Pink Barbara, a cultivar that showed the normal climacteric rise of ethylene production during senescence. We discuss a factor that possibly induces ethylene production in the carnation gynoecium.