

Abstract

Flower senescence is accompanied by the rapid death of large numbers of cells. In situ DNA degradation was studied in gypsophila (*Gypsophila paniculata*) petals during flower opening and senescence, using terminal deoxynucleotidyl transferase-mediated dUTP nick-end labelling (TUNEL). In flowers that had just opened, TUNEL staining was exclusively observed in nuclei in the vicinity of (developing) vessels, presumably reflecting xylem vessel differentiation. In fully open flowers, TUNEL positive nuclei appear in all the cells well before the increase in ethylene production and visible signs of senescence. Occurrence of TUNEL positive nuclei was stimulated by ethylene but not prevented by silver thiosulphate. The results show that gypsophila petal senescence is a form of PCD with features of animal apoptosis and suggest that nuclear DNA degradation is an early regulatory event rather than a result of massive cell death in the final stage of senescence.