

**Title** Hydrogen sulfide acts as a regulator of flower senescence in plants  
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### **Abstract**

We report the effects of hydrogen sulfide (H<sub>2</sub>S) on flower senescence in various species of cut flowers. H<sub>2</sub>S was found to delay flower opening and senescence in cut flowers and branches from *Erigeron annuus* (L.), *Euonymus maackii* Rupr., *Hibiscus syriacus* L., *Liriope spicata* (Thunb.), *Loropetalum chinense* (R. Br.), *Punica granatum* L., *Rosa chinensis* Jacq., and *Salix matsudana* Koidz. Cut explants of these plants were cultured in solution containing different concentrations of the H<sub>2</sub>S donor, NaHS. H<sub>2</sub>S donor treatment prolonged the vase time of cut flowers and prevented senescence in a dose-dependent manner. We measured the levels of malondialdehyde (MDA) as an indicator of oxidative damage to cells and showed that it was inversely related to endogenous H<sub>2</sub>S concentration in explants. Flowers that had senesced showed higher levels of MDA and lower amounts of H<sub>2</sub>S. Furthermore, NaHS treatment increased the activities of catalase (CAT), superoxide dismutase (SOD), ascorbate peroxidase (APX) and guaiacol peroxidase (POD), and sustained much lower levels of H<sub>2</sub>O<sub>2</sub> and O<sub>2</sub><sup>-</sup> in cut flowers of *E. annuus* and explant leaves of *S. matsudana*. The present study implies that H<sub>2</sub>S is involved in improving longevity of cut flowers and functions in activity of antioxidant enzymes in plants.