

# Hydrogen sulfide improves the vase life and quality of cut roses and chrysanthemums

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Journal of Plant Growth Regulation 40: 2532–2547. 2021.

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## Abstract

Recent studies indicate that hydrogen sulfide ( $H_2S$ ) plays various physiological roles in plants. However, whether  $H_2S$  participates in the postharvest senescence in cut flowers remains unknown. In this study, the regulatory roles of  $H_2S$  during the senescence of cut roses (*Rosa hybrida* L.) and chrysanthemums (*Dendranthema morifolium* Ramat.) were investigated. The results showed that compared with the control (distilled water), the 50  $\mu M$  sodium hydrosulfide (NaHS) treatment, a  $H_2S$  donor, extended the vase life of cut roses to 9.3 days and their flower diameter also showed an increment of 22.7% after 4 days treatment. Treatments with 30  $\mu M$  NaHS significantly prolonged the vase life of cut chrysanthemums to 8.87 days and the flower diameter was 13.21% longer than the control on day 6. Additionally, results also indicated that a 30 or 50  $\mu M$  NaHS treatment effectively decreased the rate of fresh weight changes and  $O_2^-$  production and  $H_2O_2$  content, increased the levels of soluble sugar, soluble protein, anthocyanin and carotenoid, and enhanced the activities of antioxidant enzymes (superoxide dismutase, peroxidase, catalase and ascorbate peroxidase) of cut roses and chrysanthemums in comparison with the control, implying that  $H_2S$  might be involved in regulating the osmotic balance, antioxidant system and the degradation of nutrient and pigments. Altogether,  $H_2S$  at proper doses might play an important role in improving the longevity and quality of cut roses and chrysanthemums by maintaining water balance, reducing the degradation of pigments and nutrient and enhancing antioxidant capacity.