

Title Exogenous proline alleviates oxidative stress and increase vase life in rose (*Rosa hybrida* L. 'Grand Gala')

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Abstract

The effect of exogenous proline on vase-life of 'Grand Gala' rose (*Rosa hybrida* L.) was studied. Pulse application of 5 mM proline enhanced the vase life of 'Grand Gala' roses by 3.3 days. This increment in vase life was coincided with higher concentration of endogenous proline and associated lower levels of superoxide radicals (O_2^-). Various isoforms of superoxide dismutase (SOD) were detected in senescing rose petals. Mn-SOD was the dominant isoform and constituted 53% (Stage-3), 74% (Stage-4), and 84% (Stage-5) of total SOD activity in proline treated flowers. Higher Mn-SOD and proline levels suppressed the generation of O_2^- and thus, slowed the senescence process and enhanced the flower longevity. Proline dehydrogenase (PDH) activity was also very high in proline treated flowers. Proline catabolism might provide higher energy to delay the ageing of flower petals. Similarly, higher reduced glutathione (GSH) content and GSH/GSSG (oxidized glutathione) ratio showed the existence of reduced redox state in cells of proline treated flower petals.