Nitric oxide and γ-aminobutyric acid treatments delay senescence of cornelian cherry fruits during postharvest cold storage by enhancing antioxidant system activity

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Abstract

Cornelian cherry fruits suffer from senescence accompanying browning during postharvest life. Cold storage is not along sufficiently effectual for postponing fruit senescence accompanying browning during postharvest life. In this experiment, the mechanism employed by NO donor sodium nitroprusside (SNP) at 0, 250, 500 and 1000 μM and γ-aminobutyric acid (GABA) at 0, 2.5, 5 and 10 mM on postponing senescence accompanying browning of cornelian cherry fruits during storage at 4 °C for 21 days was investigated. Our result showed that the cornelian cherry fruits treated with 500 μM SNP and 5 mM GABA displayed remarkably lower fruits browning during storage at 4 °C for 21 days, which may ascribe to lower H_2O_2 accumulation arising from higher reactive oxygen species (ROS) scavenging enzymes superoxide dismutase (SOD), catalase (CAT), ascorbate peroxidase (APX) and glutathione reductase (GR) activity coincided with lower ROS making enzyme lipoxygenase (LOX) activity giving rise to higher membrane integrity displaying by lower electrolyte leakage and malondialdehyde (MDA) accumulation. Accordingly, our results suggest that the postharvest SNP and GABA treatments may be promising strategies for supplying cornelian cherry fruits with lower browning owing to alleviating oxidative stress which arises from employing ROS detoxifying system for diminishing ROS accumulation leading to maintaining membrane integrity.