

Effects of hydrogen sulfide on postharvest physiology of fruits and vegetables: An overview

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Abstract

Hydrogen sulfide (H_2S) is a flammable, colorless and hazardous gas. Initially it was considered as an environment toxic gas; but, after its endogenous production discovery in plants, a wide variety of functions have been found associated with H_2S . H_2S plays an imperative role in the modulation of ripening and quality changes in various fruits and vegetables by regulating certain physiological aspects such as respiration, ethylene biosynthesis, color metabolism, enzymatic browning, softening, chilling injury and postharvest decay during storage. H_2S also acts as a signaling molecule to combat against oxidative stress by scavenging reactive oxygen species (ROS) due to up-regulation of antioxidative enzymes activities. Reduced membrane permeability, inhibited lipid peroxidation, up-regulation of antioxidant activities and inhibition of ROS production eventually leads to reduced senescence having conserved quality with extended shelf or cold storage life of H_2S treated fruits and vegetables. Potential of H_2S in delaying ripening and reducing senescence of fruits and vegetables is generally accepted. However, it may be worth considering the commercial H_2S application as a strategy of conserving external color, retarding senescence and reducing various physiological storage disorders of fruits and vegetables with acceptable consumer quality in the future. This review summarizes the possible role and mechanism of H_2S in prolonging storage life and conserving the quality attributes of fruit and vegetable crops during shelf or low temperature storage.