Synergistic effect of nitric oxide with hydrogen sulfide on inhibition of ripening and softening of peach fruits during storage

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Abstract

The effects of fumigation with NO, H_2S and combination of both on the quality, ethylene biosynthesis and softening of postharvest 'Dahong' peach fruit were investigated in current study. Results showed that NO or H_2S significantly inhibited the increase of rot index, soluble solid contents, decrease of firmness along with titratable acid contents ($P < 0.05$). Combinatorial treatment (NO+H_2S) further inhibited ripening of peach fruits, moreover it also showed significant decline in ACC content, ACC synthase and oxidase activities compared to individual treatments, was mainly linked with reduced ethylene production. The combined treatment significantly inhibited the increase of water-soluble and CDTA-soluble cell wall fractions, the decrease of Na_2CO_3-soluble fractions in peach fruit with significantly reduced softening related enzymes activities. These observations suggested the existence of synergistic functions between NO and H_2S in inhibiting ethylene biosynthesis and cell wall metabolism in order to maintain superior quality of peach fruits.