

Abstract

“Rhapsody” tomatoes heated for 24 h in air at 34°C or 38°C were compared to fruit heated in 5% O₂ at 38°C in order to determine if heat treatment applied in reduced O₂ pressure might reduce stress-related oxidative changes that sometimes accompany heat injury. Fruit were subsequently stored at 4°C or 10 °C for up to 30 days. Unheated fruit and those heated in air at 34°C for 24 h developed the best colour during storage at 10°C. Storage at 4°C inhibited carotenoid development in all treatments. Fruit heated in air or in 5% O₂ lost the most ascorbic acid and isoascorbic acid. Glutathione reductase activity at the end of storage was similar in all fruit, while glutathion S-transferase activity was higher in fruit that had initially been heated in 5% O₂. Therefore, heating of ‘Rhapsody’ tomato fruit in air at 34°C for 24 h prior to storage at 10°C for up to 30 days resulted in the least losses in antioxidant content, and fruit colour developed adequately. Reduced O₂ pressure neither improved the efficacy of the heat treatment in reducing chilling injury nor protected tomato fruit from the negative effects of heat treatment.