

Abstract:

High-pressure treatment (HPT) has the potential of extending the postharvest life of fresh fruits by suppression of ethylene production. Pressures over 5 MPa, however, are above the threshold for irreversible tissue damage for several fruits. This study was conducted to evaluate whether HPT below 5 MPa could prolong the postharvest life of mume fruit that produce large amounts of ethylene after harvest. Pressure was generated by compressing air into a high-pressure unit (OM labotech, Japan). Fruit were subjected to HPT at 5, 4, 3, 1 and 0.5 MPa for 10 min, and subsequently maintained at 0.5 MPa for 5-days. Physical and physiological changes of fruit subjected to pressures were investigated. HPT of 5 MPa for 10 min changed surface color and decreased ethylene production. Pre-climacteric fruit subjected to lower pressures (<3 MPa) kept a commercially acceptable color quality. These fruit exhibited higher rates of CO₂ and ethylene production just after transfer to atmospheric pressure. The peel of control fruit and those subjected to <3 MPa changed similarly in color from green to yellow. Treatment of 0.5 MPa for 5-days decreased CO₂ and ethylene production during storage. It dramatically decreased weight loss and showed benefits against chilling injuries such as skin pitting and browning. Visual comparison indicated a retardation of peel color development in treated fruit. These results indicated that long-term HPT at 0.5 MPa affects not only CO₂ and ethylene production but also water loss, and it may prolong the postharvest life of mume fruit.