

Title Evaluation of the physiological response of Maradol papaya (*Carica papaya* L.) to ethylene and further ripening at 30 °C

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Abstract

In previous studies on accelerated ripening of papaya by exposure to 100, 300 or 500 mg/L exogenous ethylene for different periods (8, 16, or 24 h), it was found that better results were obtained by treatment with 500 mg/L ethylene for 24 h. Ripening time was shortened by 3 d when ripened at 25 °C. According to producers, further shortening of the ripening time at tropical conditions is desirable since papayas require much longer time to reach edible maturity when the fruit is transported and handled into temperate climates. Additionally, deviations from proper ripening also occur at temperatures below those of the production sites. The objective of the study was to evaluate the physiological response of Maradol papayas after exposure to 500 µL/L ethylene, designed to accelerate their ripening time. Fruit were obtained from a local grower near Veracruz, Mexico. Upon reception, papayas were immersed in water at 45 °C for 30 min and introduced to sealed chambers in which an atmosphere containing 500 µL /L ethylene was maintained for 24 h. After the treatment, fruit were stored at 25 °C or 30 °C. Treated fruit that were maintained at 30 °C developed softer texture 24 h after exposure, while those papayas kept at 25 °C developed the same degree of softness only after 48 h. Total soluble solids content increased to the highest level at d 3 of storage at either temperature. Color changes in the peel (from green to orange) and the pulp (from white to orange-red) was noted 12 h after exposure in fruit stored at 30 °C, while papayas kept at 25 °C showed slower color development. Respiration climacteric peak was measured 24 h post-treatment, while control fruits showed this peak after 5 d. Surface mold growth represented no major concern due to the heat treatment and short ripening time. The ethylene treatment used and storage of papayas at 30 °C produced a climacteric only 24 h after treatment. Application of these conditions could reduce handling time and costs.