

## ACTIVITY AND GENE EXPRESSION OF ETHYLENE BIOSYNTHETIC ENZYMES OF 'IRWIN' MANGO DURING FRUIT RIPENING

T.T. Soe, K. Koshio, H. Takahashi, S. Iwahori, S. Sugaya, H. Gemma

### Abstract

The present investigation was undertaken to study the effect of storage temperature in controlling ethylene production through the activity and gene expression of ethylene biosynthetic enzymes of 'Irwin' mango during fruit storage. Ethylene evolution and activities of ethylene biosynthetic enzymes, 1-aminocyclo-propane-1-carboxylic acid (ACC) synthase and ACC oxidase were investigated using fruit harvested at commercial maturity and stored at 20 and 13°C, together with gene expression of these enzymes. Just after harvest respiration was high although it soon decreased. A climacteric peak was observed after 6 days at 20°C or 8 days at 13°C. Peak ethylene evolution occurred after 2 days at 20°C or 12 days at 13°C although ethylene evolution steadily increased after 4 days at 13°C. Highest activities of ACC synthase and ACC oxidase were recorded after 2 at 20°C and 8 days at 13°C, coinciding with ethylene climacteric peaks. Expression of both ACC synthase and ACC oxidase genes was higher for fruit stored at 13°C than at 20°C. The dynamism of ethylene biosynthetic enzyme activity and gene expression of those enzymes indicated enhanced effectiveness at lower storage temperatures.

**Keywords:** ACC synthase, ACC oxidase, different temperatures, ethylene production, ripening gene