Title The Effects of Harvest Maturity on Storage Quality and Sucrose-Metabolizing Enzymes During Banana Ripening

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Abstract

Mature green "Baxi" banana (*Musa* spp. AAA Group, Cavendish) fruits were harvested at 60% and 80% maturity stages. In order to evaluate the effects of harvesting at different maturity stages on storage quality and changes in sucrose-metabolizing enzymes, fruit firmness, disease index, contents of starch, and total soluble sugars were determined, and enzyme activities associated with sucrose metabolism was investigated under natural and accelerated (treated with ethylene) ripening conditions. In fruit treated with ethylene, changes in flesh firmness, total sugar content, starch content, disease index, and activity of sucrose phosphate synthase (SPS), sucrose synthase (SS), acid invertase (AI), and neutral invertase (NI) were accelerated dramatically compared with untreated fruit with both 60% and 80% maturity. When fruit ripened under natural conditions, the changes in firmness, disease index, starch content, total sugar content, SPS activity, SS, AI, and NI activity in fruit with 80% maturity were significantly faster than those in fruit with 60% maturity. On the contrary, when fruit ripened under accelerated conditions, no significant differences in firmness, sugar, starch, disease index, SPS, SS, AI, and NI were observed between fruit harvested at 60% or 80% maturity. It is suggested that storage quality and sucrose-metabolizing enzymes of banana fruit stored under natural conditions are related to harvest maturity stage; storage quality of fruit with lower harvest maturity is better than fruit with higher maturity. However, when fruit ripening is accelerated by ethylene, the harvest maturity stage has no influence on storage quality and changes in sucrose-metabolizing enzymes.