

## Metabolism of Soluble Sugars in 4 Varieties of Banana, and Activity of Associated Enzymes

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### Abstract

Changes in amounts of sucrose, hexoses (glucose and fructose), and in activities of Sucrose-phosphate synthase (SPS), Sucrose synthase (SuSy) (sucrose hydrolytic way), Neutral Invertase (NIV) and Acid Invertase (AIV) were studied during development and ripening *in-planta* of banana fruit (2 dessert varieties: IDN 110 (*M. acuminata* AA) and Kirun (*M. acuminata* AA); and 2 cooking varieties: Galéo (*M. acuminata* AA) and Somwuck (*M. acuminata* AA). During ripening, all the varieties presented the same pattern of total soluble sugar accumulation. The most remarkable result was that cooking varieties did not accumulate sucrose contrarily to the dessert ones. SPS activity of dessert varieties increased throughout fruit development and ripening. For cooking varieties the activity firstly decreased during development. It increased then after at the beginning of ripening with a peak at half-ripe stage. SuSy activity of all varieties presented the same pattern of changes during development and ripening. Constant at a low level during development, it became extremely low and constant during ripening. NIV activity was extremely low and constant whatever the variety and the developmental stage. AIV activity was low for the two dessert varieties with however a small increase during ripening. Interestingly, it increased drastically during the same period for the low sucrose-accumulating cooking varieties (approximately 6-fold more than for dessert varieties). Our results show that: i) even if SPS activity increases concomitantly to soluble sugar accumulation, we did not find a correlation between its level and the amount of total soluble sugars or sucrose. ii) there is a strong correlation between the level of AIV activity and the ratio sucrose / hexoses; the higher the AIV activity is, the lower the ratio being. This means that AIV could be one of main determinants of the sugar composition of diploid banana fruit by correlating the ratio sucrose / hexoses.