Title Effect of heat treatment on ripening and early peel spotting in cv. Sucrier banana

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Abstract

We studied the effect of heat treatment on peel spotting in cv. Sucrier banana. Fruit that had ripened to colour index 3–4 were placed at 42 °C (78% RH) for 6, 12 18 or 24 h before shelf-life at 25 °C and approximately 78% RH. The heat treatment inhibited peel spotting and did not impair ripening. Treatment for 24 h was the most effective to control spotting, but it reduced taste and odour to unacceptable levels. After the 18 h treatment peel spotting was considerably reduced whilst the taste and odour remained acceptable. The *in vitro* phenylalanine ammonia lyase (PAL) activity of heat-treated bananas was lower than in non-treated fruit, from day 2 of shelf-life onward. The *in vitro* activity of polyphenol oxidase (PPO) was lower in treated fruit, but only clearly from day 4 of treatment onward. Total phenolics and dopamine content of treated bananas, in contrast, were higher. Heat treatment decreased lipoxygenase (LOX) activity and, unexpectedly, increased the level of thiobarbituric acid-reactive compounds, which is an indicator of membrane lipid peroxidation. The data show that the *in vitro* activity of enzymes involved in the production of substrate (PAL) and in the initial browning reactions (PPO) were inhibited by the treatment. The heat treatment apparently did not delay the membrane degradation required for the interaction between the substrate and the enzymes that catalyze the browning reactions, suggesting that the main effect of the heat treatment was in the enzymatic steps involved in the browning reactions.