

**Title** Hot water treatments delay cold-induced banana peel blackening  
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### **Abstract**

Banana fruit of cv. Gros Michel (*Musa acuminata*, AAA Group, locally called cv. Hom Thong) and cv. Namwa (*Musa × paradisiaca*, ABB Group) were immersed for 5, 10 and 15 min in water at 42 °C, or in water at 25 °C (control), and were then stored at 4 °C. Hot water treatment for 15 min delayed peel blackening during cold storage by about 4 days in cv. Gros Michel and by 2 days in cv. Namwa. In both cultivars the delay of blackening was correlated with an increase in the ratio of unsaturated to saturated fatty acids. Hot water treatment in cv. Gros Michel but not cv. Namwa was correlated with lower lipoxygenase (LOX) activity and lower levels of thiobarbituric acid-reactive compounds. The results suggest that the rapid peel blackening of cv. Gros Michel is related to detectable membrane degradation, whereas the membrane-associated changes might be below the detection limit in the slower blackening cv. Namwa. The delay of peel blackening in cv. Gros Michel was associated with reduced expression of a catechol oxidase gene, which might partially explain the lower catechol oxidase activity after hot water treatment. The hot water treatment also increased the abundance of a *Hsp70* transcript. The changes in gene expression found in cv. Gros Michel were not observed in cv. Namwa. Taken together the delay of blackening by hot water treatment in cv. Namwa was only correlated with a change in the ratio of unsaturated to saturated fatty acids, whereas that in cv. Gros Michel was additionally correlated with lower LOX activity, lower mRNA abundance of a gene encoding a catechol oxidase and lower catechol oxidase activity.