

Title Study of physiological and molecular changes related with browning development on fresh cherimoya (*Annona cherimola* Mill.)

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Abstract

Cherimoya (*Annona cherimola* Mill.) are prone to browning when the fruits are wounded during minimal processing. Therefore, our study has been focused to understand the physiological basis of browning and the role of polyphenol oxidase enzyme (PPO) in this process. PPO activity apparently is related with ripening since mature fruits showed higher values than ripe fruit. In addition, the PPO activity in the rind was at least four times higher than the flesh, and there is a higher PPO activity in the flesh close to the rind than near the center of the fruit. At the molecular level, we have cloned a fragment of putative cherimoya *PPO* gene and experiments to study *PPO* expression in cherimoya tissues and fresh cut pieces are under way, as well as characterization of *PPO* promoters. As a technological approach we have assayed antioxidant treatments to prevent browning. The treatment with 0.5% cysteine applied just after processing has show promise in browning reduction in fresh cut cherimoya stored for 6 days at 0°C. The application of cysteine did not change soluble solids and acidity of cherimoya pieces, but the total phenolic compounds were modified (funded by FONDECYT 1040011).