

Abstract:

The potential of 20% CO₂ plus 20% O₂ for 3 days pre-treatment to activate the defense mechanism and to alleviate the characteristic responses of chilling injury during long-term storage of cherimoya fruit at 6°C has been analyzed. Immunoassays studies, with antisera against PR-Q and PR-2 proteins, revealed that CO₂ pre-treatment provoked coordinated induction of chitinase-like protein and 1,3-β-glucanase, which was reverted after transfer to air. When cherimoya fruit was long-term stored at chilling temperature, a significant increase in lignin accumulation and PAL activity was observed. Pre-treatments with high CO₂ levels avoided rigidity and arrested both the increase in PAL activity and lignin accumulation. Other biochemical responses associated to long exposure to chilling temperature are accumulation of putrescine and ADC activity upswing. The effect of high CO₂ in delaying the putrescine content rise and the increase in ADC activity in fruit stored, in response to chilling temperature storage, is also described. As chilling temperature causes cytoplasmic acidosis, as we previously reported by ³²P-NMR spectroscopy, the structural and biochemical responses observed in CO₂-treated cherimoyas must be related to changes in cytoplasmic pH.