

Title Biochemical and colour changes of watercress (*Nasturtium officinale* R. Br.) during freezing and frozen storage

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Abstract

The effects of water blanching, freezing, and frozen storage during 400 days at three different temperatures (-7, -15 and -30 °C), on watercress (*Nasturtium officinale* R. Br.) colour Hunter Lab parameters, chlorophyll degradation, vitamin C content loss and peroxidase (POD) activity were evaluated. The blanching induced significant changes on colour values and chlorophylls and vitamin C contents. POD activity was reduced 85% from its initial value. Freezing did not affect chlorophylls and vitamin C levels, however, promoted significant differences in colour values and POD residual activity. During frozen storage, ascorbic acid (AA) and POD activity degradations followed first-order kinetics, and colour parameters ($L_H \cdot a_H \cdot b_H$, $-a_H/b_H$, $L_H \cdot a_H/b_H$, $L_H/a_H \cdot b_H$ and hue (°)) were successfully described by zero-order kinetics. The storage temperature effect was successfully described by the Arrhenius law. Chlorophylls and dehydroascorbic acid (DHAA) contents were kept constant during frozen storage.