

The Biochemistry of Florets Senescence in Broccoli Cultivars During Storage at Low and High Temperatures

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Abstract:

The relationship between oxidative stress and florets senescence of five broccoli cultivars was investigated during two different storage temperatures. Florets were stored three days at 20 °C or 40 days at 0 °C, followed by two additional days at 20 °C. The florets deterioration rate was strongly affected by storage temperature. Subsequently, a rapid decrease of chlorophyll was observed at 20 °C. Postharvest senescence of broccoli is correlated with increasing lipid peroxidation (MDA) level, lipoxygenase (LOX) activity and a decline in protein content that has been used as a direct indicator of membrane injury. The antioxidant protection incurred by superoxide dismutase (SOD) and peroxidase (POD) enzymes is important for the retention of green colour in broccoli flower buds and the increases in POD were likely related to florets yellowing. The results showed that storage of the most broccoli cultivars at room temperature (20 °C) caused a significant increase in SOD activity, while at 0°C activity of the enzyme declined at the end of 40 days, and thereafter increased at room temperature. The lowest POD and increase in SOD activity in 'General' and 'Revolution' cultivars at 0°C storage, and 'Liberty' and 'Revolution' at 20 °C, is important for the retention of green color in florets.