

Melatonin delays yellowing of broccoli during storage by regulating chlorophyll catabolism and maintaining chloroplast ultrastructure

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Abstract

The effect of melatonin treatment on color, chlorophyll degradation and chloroplast structure in broccoli during storage was evaluated. One hundred $\mu\text{mol L}^{-1}$ melatonin markedly extended the shelf life of broccoli. Compared with control florets, melatonin treatment delayed the decline of chlorophyll content, and maintained more intact chloroplasts. Meanwhile, melatonin also suppressed the activities of chlorophyll catabolic enzymes such as chlorophyllase (CLH), pheophytinase (PPH), pheophorbide a oxygenase (PAO) and red chlorophyll catabolite reductase (RCCR), and down-regulated the expressions of *BoNYC1*, *BoNOL*, *BoCLH*, *BoPPH*, *BoPAO*, *BoRCCR* and *BoSGR1* involved in chlorophyll catabolism. Taken together, our results indicated that melatonin could be a good candidate for delaying yellowing in broccoli during storage at 20 °C.