

Melatonin triggers metabolic and gene expression changes leading to improved quality traits of two sweet cherry cultivars during cold storage

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Sweet cherry is a valuable non-climacteric fruit with elevated phytonutrients, whose fruit quality attributes are prone to rapid deterioration after harvest, especially peel damage and water loss of stem. Here the metabolic and transcriptional response of exogenous melatonin was assessed in two commercial cultivars of sweet cherry (Santina and Royal Rainier) during cold storage. Gene expression profiling revealed that cuticle composition and water movement may underlie the effect of melatonin in delaying weight loss. An effect of melatonin on total soluble solids and lower respiration rate was observed in both cultivars. Melatonin induces overexpression of genes related to anthocyanin biosynthesis, which correlates with increased anthocyanin levels and changes in skin color (Chroma). Our results indicate that along with modulating antioxidant metabolism, melatonin improves fruit quality traits by triggering a range of metabolic and gene expression changes, which ultimately contribute to extend sweet cherry postharvest storability. © 2020 Elsevier Ltd

Cold storage

Cyanidin-3-glucoside (PubChem CID: 197081)

Fruit quality

Malondialdehyde (PubChem CID: 10964)

Melatonin

Melatonin (PubChem CID: 896)

Sweet cherry

Anthocyanins

Biochemistry

Cold storage

Deterioration

Food storage

Fruits

Gene expression

Metabolism

Plants (botany)

Anthocyanin biosynthesis

Fruit quality

Gene expression profiling

Melatonin

Non-climacteric fruits

Pubchem

Sweet cherries

Transcriptional response

Hormones

anthocyanin

antioxidant

melatonin

melatonin

Article

biochemical composition

biosynthesis

controlled study

cryopreservation

cultivar

food quality

food storage

gene expression

harvest

metabolism

plant stem

postharvest period

sweet cherry

water flow

water loss

drug effect

fruit

gene expression regulation

sweet cherry

Anthocyanins

Fruit

Gene Expression Regulation

Melatonin

Prunus avium