

Title Effect of high-temperature-conditioning treatments on quality, flavonoid composition and vitamin C of cold stored 'Fortune' mandarins

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Abstract

The effect of high-temperature-conditioning treatments (1–2 days at 37 °C) on fruit quality, flavonoids, total antioxidant capacity (TAC) and vitamin C was investigated in chilling-sensitive 'Fortune' mandarins subjected to single or double quarantine treatments (16 or 32 days at 1.5 °C, respectively). High temperature-conditioning treatments, which reduced chilling injury, allowed fruits to withstand quarantine treatments without affecting the fruit quality, vitamin C or TAC. Hesperidin and isorhoifolin were the most abundant flavonoids followed by didymin and narirutin, whereas the polymethoxylated flavones (PMFs) nobiletin and tangeretin were the less abundants. Didymin and narirutin slightly increased (\sim 1.5-fold) at 1.5 °C. A 4-fold increase occurred in eriocitrin, though its concentration was much lower. Small differences in flavonoids were found between non-conditioned fruit and fruit conditioned for 1 day after cold storage and their concentration in carpellary membranes were, in general, much higher than in juice. Therefore, fruit conditioning at 37 °C allows chilling-sensitive citrus cultivars to withstand quarantine treatments without having deleterious effects on the fruit quality, vitamin C or relevant flavonoids.