

Physiochemical changes in *Citrus reticulata* cv. Shatangju fruit during vesicle collapse

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Abstract

'Shatangju' (*Citrus reticulata*) is a popular mandarin that easily develop vesicle drying, which is one of the most common internal physiological disorders of citrus fruit. The vesicle drying occurred firstly in the peel-side of the segment of 'Shatangju' fruit, and then the juice sac shrank gradually with the development of the syndrome, which finally resulted in the collapse and hollowing of the segments. The incidence of vesicle collapse increased with the storage temperature and the seed number. After storage at 10 °C and 20 °C for 90 d, over 80 % of the fruit developed vesicle collapse syndromes. The physiochemical characteristics of healthy segments and the vesicle collapsed segments were subsequently compared in detail. The results showed that, the physiochemical changes of 'Shatangju' fruit during vesicle collapse were characterized by the increase of H₂O₂, MDA, flavonoids and cell wall compounds, and by the decrease of carotenoids, ethanol, ethyl acetate, d-limonene and β-myrcene, as well as by the modest decrease of sugars and acids. In addition, the contents of amino acids in the vesicle collapsed segment changed slightly. Taken together, the results indicated that the vesicle collapse of 'Shatangju' fruit involved in the changes of primary metabolism, secondary metabolism as well as the peroxidation of the tissue. Present study provided detailed information about the physiochemical alterations occurring in the vesicle collapsed segment of 'Shatangju' mandarin.