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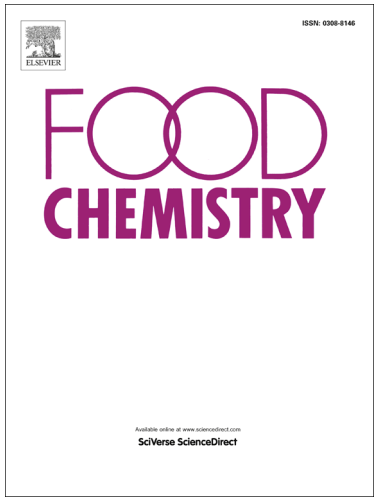

Fruit Sugar and Organic Acid Were Significantly Related to Fruit Mg of Six Citrus Cultivars

Yuan Zhou, Weizhu He, Wulin Zheng, Qiling Tan, Zongzhou Xie, Cangsong Zheng, Chengxiao Hu

PII: S0308-8146(18)30535-1
DOI: https://doi.org/10.1016/j.foodchem.2018.03.102
Reference: FOCH 22645

To appear in: *Food Chemistry*

Received Date: 26 October 2017
Revised Date: 17 March 2018
Accepted Date: 22 March 2018

Please cite this article as: Zhou, Y., He, W., Zheng, W., Tan, Q., Xie, Z., Zheng, C., Hu, C., Fruit Sugar and Organic Acid Were Significantly Related to Fruit Mg of Six Citrus Cultivars, *Food Chemistry* (2018), doi: https://doi.org/10.1016/j.foodchem.2018.03.102

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Fruit Sugar and Organic Acid Were Significantly Related to Fruit Mg of Six Citrus Cultivars

Yuan Zhou[a,b,c], Weizhu He[a,c], Wulin Zheng[a,c], Qiling Tan[a,c], Zongzhou Xie[b], Cangsong Zheng[a,c], Chengxiao Hu[a,b,c,*1]

[a] *College of Resources and Environment/Micro-element Research Center/Hubei Provincial Engineering Laboratory for New Fertilizers, Huazhong Agricultural University, Wuhan, Hubei Province 430070, PR China*

[b] *Key laboratory of Horticultural Plant Biology (HZAU), MOE, PR China*

[c] *Key Laboratory of Arable Land Conservation (Middle and Lower Reaches of Yangtze River), Ministry of Agriculture, PR China*

Abstract: The fruit quality of 6 citrus cultivars growing in the same orchard was determined at ripening stage in both 2014 and 2015. We further measured the components of sugar (sucrose, fructose and glucose), organic acid (citric, malate and quinic acid) and mineral elements at 5 stages of fruit development in the second year. The results showed that at ripening stage of both years, 'Newhall' cultivar had higher TSS concentration and the TSS/TA ratio but lower TA concentration, while 'Flame' cultivar was exactly opposite. Sucrose and citric acid were the most observably accumulated compounds in fruits during fruit development. Fruit sucrose concentration increased from 9.26 mg·kg^{-1} at 60 DAFB to 50.92 mg·kg^{-1} at 180 DAFB, and the citric acid concentration increased from 1.41 mg·kg^{-1} at 60 DAFB to 29.87 mg·kg^{-1} at 90 DAFB then decreased till ripening (29.02-5.47 mg·kg^{-1}). 7 enzymes related to Glycolytic and Krebs cycle were determined. We found ACO was the key enzyme resulting in the difference of citric acid accumulation, but not quite clear in sucrose metabolism. The fruit mineral element concentrations of 6 cultivars during fruit ripening were 0.94-1.92% of N, 0.11-0.23% of P, 1.03-1.37% of K, 0.31-1.15% of Ca, 0.11-0.29% of Mg, 3.97-72.34 mg·Fe kg^{-1}, 1.93-10.64 mg·Mn kg^{-1}, 1.56-10.73 mg·Cu kg^{-1}, and 0.90-16.80 mg· Zn kg^{-1}. We analyzed the relationship among each sugar, organic acid components and mineral nutrients in this study by curve estimation and PCA analysis. The results indicated that only Mg was significantly correlated with both sugar and organic acid components, negative and positive respectively. It suggested that the accumulation of sugar and organic acid might be related to the dynamic changes of fruit Mg concentration of 6 citrus cultivars.

Keywords: Citrus Cultivar, Fruit Quality, Sugar, Organic Acid, Mineral Nutrients, Characteristics, Relationships

* Corresponding author at: Huazhong Agricultural University, No. 1, Shizishan Street, Hongshan District, Wuhan, Hubei Province 430070, PR China.

E-mail addresses: hucx@mail.hzau.edu.cn (Chengxiao Hu).

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