

Metallic ions distribution in texture and phenolic content contrasted cider apples

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Postharvest Biology and Technology, Volume 160, February 2020, 111046

Abstract

Metallic ions were quantified and mapped at the tissue and the cell scales in two texture and phenolic content contrasted cider apples by atomic absorption spectroscopy, ion chromatography and synchrotron cryo X-ray fluorescence imaging. Metallic ions content and gradient distribution from the cuticle to the inner tissue significantly varied between years of harvest (1–294 % of differences between years). The content of non-esterified uronic acid in the cell wall pectin was also measured (3.1 and 4.9 mol kg⁻¹ of dry weight fruit) and found higher than the total metallic ions in the two varieties (0.22 and 0.27 mol kg⁻¹ of dry weight fruit). Calcium content and cell wall pectin methyl-esterification were not determinants distinguishing firm from soft apples. The results are discussed with regard to the co-location of metallic ions with the phenolic compounds which questions their role in oxidative mechanisms during fruit development and processing, affecting particularly the colour and taste of fruit products.