Abstract

Avocado (*Persea americana* Mill.) fruit is a valuable product and notorious for the difficulties encountered in determining quality. Typically the degree of ripeness of many climacteric fruits, such as avocado, is measured by assessing flesh firmness. The aim of the presented work was to elucidate the temporal and spatial changes in texture, biochemistry and micro-structure in different avocado tissues from the same fruit. Fruit were first treated with ethylene and then ripened at 12°C. Samples were taken four times over 11 days storage. Maximum load and viscoelasticity of horizontally-cut slices from fruit (n = 24) imported from Peru were measured during ripening. These texture parameters were measured using an Instron 5542 universal testing machine fitted with a 500N or 5N load cell. Non-structural carbohydrates (NSCs; viz. sucrose, mannoheptulose, perseitol) and fatty acid methyl esters from the same samples were identified and quantified using standard HPLC coupled to evaporative light scattering detection and gas chromatography coupled to flame ionization detection, respectively. Samples taken from adjacent mesocarp tissue slices were examined: Each specimen included the thick outer epidermis, fleshy mesocarp and 'inner' epidermis located next to the seed. An analysis of variance was performed to elucidate the change of parameters during fruit ripening. NSC content and textural properties changed during ripening and showed spatial heterogeneity within individual fruit. Micro-structural changes were evident during the latter stages of ripening and coincided with fruit softening and degradation in mannoheptulose. These findings might be used to enhance quality monitoring of imported avocado fruit.