Abstract

Texture is a key quality parameter for long-term stored fruit; it is widely recognized that alterations in microstructure often correlated with changes in texture. Understanding the processes-that involve tissues, which take place during storage of 'Rocha' pear is thus essential in attempts to optimize postharvest quality of said cultivar, and hence to maximize shelf-life; this requires accurate monitoring of the microstructure and texture, and effective modeling of their behavior throughout storage time. The main objective of this work was to assess and model the influence of storage, under various controlled atmospheres, on the microstructure and texture of 'Rocha' pear. Towards that goal, 'Rocha' pears were stored for 4 mo at 2°C, under 2 kPa O_2 + 5 kPa CO_2, 2 kPa O_2 + 0.5 kPa CO_2 and 2 kPa O_2 – suing air as control. The microstructure of the product was evaluated via scanning electron microscopy (SEM): quantitative image analysis proceeded by panel evaluation. After storage, a selected microstructure parameter-i.e. degree of cellular destruction, and sensory and instrumental measures of firmness were monitored by 1, 6 and 8 d of exposure to air, at room temperature. The degree of cellular destruction increased, and sensory and instrumental measures of firmness decreased over time, at room temperature. Pears stored under 2 kPa O_2 + 0.5 kPa CO_2 were firmer-in both sensory and instrumental points of view, than under the other storage conditions tested, and exhibited a lesser degree of cellular destruction (that was essentially similar to that of the control). The dependence of instrumental firmness on time at room temperature was well described by an (empirical) exponential decay model, the constant of which was influenced by the storage conditions. Sensory and microstructure parameters were modelled according to a Michaelis-Menten type equation.