

Abstract:

Texture of fresh fruit and vegetables is determined by both product water status and cell wall mechanical properties. Both parameters can be either differentially or concomitantly influenced by the various storage conditions during the entire postharvest chain. In this study we focused on the investigation of the basic effects of temperature and water status on the texture of intact fresh carrots and radish tubers. Despite many efforts, the interactive effects of these parameters on texture are still not well understood. This is due to the fact that texture is a complex and variable quality parameter that can be described by many different independent terms, e.g. by tissue elastic properties, tensile strength and tissue firmness. In carrots and in radish tubers, water potential and pressure potential were related with both firmness, as indicated by the cutting force, and stiffness. However, only the latter showed a significant correlation with both water status factors. Beyond wilting, the variation of firmness with declining water potential was less pronounced. In carrots, firmness, stiffness and turgor were higher at lower tissue temperature, reaching highest values at 5°C. In long-term cold stored carrots, the texture properties changed due to physiological acclimation processes, known as cold-acclimation, without any variation in water potential.