Title	Effect of storage period on the molecular-mass distribution profile of pectic and hemicellulosic polysaccharides in pears
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Abstract

We investigated the effects of the storage period on the molecular distribution profile of pectic and hemicellulosic polysaccharides in ‘Maruguerite Marillat’ and ‘La France’ pears. After storage of fruit of both cultivars for 1 month (short-term storage) at 1 °C, or 4 months (long-term storage) for ‘Marguerite Marillat’ and 5 months (long-term storage) for ‘La France’, the fruit were transferred to 20 °C for ripening. Based on the firmness of the flesh, five fruit at different stages of softening (from hard to soft) from each storage condition were selected for analysis. The fruit softened after transfer to 20 °C after storage at 1 °C, independently of the cultivar or storage period. However, after long-term storage, the fruit did not achieve the buttery and juicy texture known as the melting texture, whereas after short-term storage, fruit of both cultivars reached these textures. When the fruit developed the melting texture, both the uronic acid and total sugar components of the water-soluble polyuronides (WSP) showed striking molecular-mass downshifts, concomitant with increases in the levels of smaller polymers. In over-ripe fruit, the molecular-mass downshifts were extensive. In fruit that had been subjected to long-term storage, the uronic acid component of the WSP also showed a tendency toward molecular-mass downshifts as the fruit softened. However, no relationship was observed between fruit softening and changes in the molecular-mass distribution of the total sugar component. In ‘Marguerite Marillat’ and ‘La France’ fruit after short-term storage, the molecular-mass distribution of the total sugar and xyloglucan components of the hemicellulosic polysaccharides did not change significantly until the fruit developed the melting texture. After that point, the peak shifted greatly toward the low-molecular-mass region. In fruit after long-term storage, the total sugar and xyloglucan components also showed molecular-mass downshifts. However, the extent of the downshifts was still larger in fruit after short-term storage than in those after long-term storage. These results suggest that reduced depolymerization of pectic and hemicellulosic polysaccharides is related to an inferior fruit texture after prolonged storage.