Title Effect of high hydrostatic pressure (HHP) treatment on texture changes of water bamboo shoots cultivated in China

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Abstract

It is well known that high hydrostatic pressure (HHP) treatment will increase the shelf life of different fruit. However, texture changes associated with these responses are not well understood in vegetables. The objective of this work was to study the effects of HHP treatment on quality and lignification of minimally processed water bamboo shoots cultivated in China. Water bamboo shoots were exposed to HHP treatment for 10 min at room temperature (25 °C) and then stored for 7 days at 4 °C. Firmness, lignin and cellulose contents, and enzyme activities of phenylalanine ammonia lyase (PAL) and peroxidase (POD), were investigated during storage. An increase in firmness of water bamboo shoots was observed, and this increase after harvest was positively correlated with higher lignin and cellulose contents, $r = 0.96$, $P < 0.05$; $r = 0.98$, $P < 0.01$ respectively. Accumulation of lignin in flesh tissue was also positively correlated with activities of PAL and POD, $r = 0.97$, $P < 0.01$; $r = 0.90$, $P < 0.05$ respectively. PAL and POD activities showed a persistent rise over the whole 7 days. HHP treatment resulted in lower firmness, delayed activities of PAL and POD, and retardation of lignin and cellulose accumulation. These studies showed that HHP might be an efficient nonthermal alternative for extended shelf life of water bamboo shoots.