

赵云峰,林河通,王静,林艺芬,陈艺晖.热处理抑制采后龙眼果肉自溶及细胞壁物质降解[J].农业工程学报,2014,30(11):268-275

热处理抑制采后龙眼果肉自溶及细胞壁物质降解

Inhibiting aril breakdown and degradation of cell wall material in pulp of harvested longan fruits by heat treatment

投稿时间: 2014-01-15 最后修改时间: 2014-04-05

中文关键词: [热处理](#) [果实](#) [降解](#) [龙眼](#) [果肉自溶](#) [细胞壁组分](#) [细胞壁降解酶](#)

英文关键词: [heat treatment](#) [fruits](#) [degradation](#) [longan \(Dimocarpus longan Lour.\)](#) [aril breakdown](#) [cell wall component](#) [cell wall-degrading enzyme](#)

基金项目:国家自然科学基金项目(30200192、30972070、31171776、31201445); 国家科技支撑计划项目(2007BAD07B06); 高等学校博士学科点专项科研基金项目(20123515120016、20133515110014); 福建省自然科学基金项目(2011J01079、2012J05040)

作者	单位
赵云峰	1. 福建农林大学食品科学学院, 福州3500023. 盐城工学院化学与生物工程学院, 盐城 224051
林河通	1. 福建农林大学食品科学学院, 福州3500022. 福建农林大学农产品产后技术研究所, 福州350002
王静	1. 福建农林大学食品科学学院, 福州3500022. 福建农林大学农产品产后技术研究所, 福州350002
林艺芬	1. 福建农林大学食品科学学院, 福州3500022. 福建农林大学农产品产后技术研究所, 福州350002
陈艺晖	1. 福建农林大学食品科学学院, 福州3500022. 福建农林大学农产品产后技术研究所, 福州350002

摘要点击次数: 72

全文下载次数: 29

中文摘要:

为了阐明热水处理抑制采后龙眼果实果肉自溶的作用机理, 研究热水处理对采后龙眼果实果肉自溶和细胞壁组分含量、细胞壁降解酶活性的影响。将“福眼”龙眼果实经50℃热水处理10 min, 用0.015 mm厚的聚乙烯薄膜袋密封包装, 贮藏于(15±1)℃条件下。在贮藏期间定期测定龙眼果实果肉自溶指数、细胞壁组分含量和细胞壁降解酶活性。结果表明: 与未经热水处理, 相同贮藏条件下的对照果实比, 热处理可显著(P<0.05)抑制龙眼果实果肉自溶指数的上升, 降低果胶甲酯酶(pectinmethylesterase, PME)、多聚半乳糖醛酸酶(polygalacturonase, PG)、β-半乳糖苷酶(β-galactosidase, β-Gal)和纤维素酶(cellulase, CX)的活性, 延缓水溶性果胶(water-soluble pectin, WSP)含量的上升和离子结合型果胶(ionic-soluble pectin, ISP)、共价结合型果胶(covalent-soluble pectin, CSP)、半纤维素和纤维素含量的下降。因此认为, 热处理可通过降低采后龙眼果实果肉细胞壁降解酶的活性而减少细胞壁组分的降解, 从而维持细胞壁结构的完整性, 抑制果肉自溶的发生。研究结果为热处理技术在采后龙眼果实保鲜中的应用提供参考。

英文摘要:

Abstract: Longan (*Dimocarpus longan* Lour.) is high value fruit produced in southern China. Due to its higher nutritional value and health benefit, consumers love the fruit. But longan is highly susceptible to aril breakdown during storage, which is the single most important factor affecting the quality and shelf-life of postharvest longan fruits. Previous studies have shown that aril breakdown is caused by changes in the structure of fruit cell tissue due to cell wall metabolism. Heat treatment is an environment-friendly postharvest physical treatment, which can insect disinfestation, decay control, ripening delay, modification of fruit responses to other stresses and maintain quality of harvested fruits and vegetables. The effects of hot-water treatment (HWT) on aril breakdown, cell wall component contents and cell wall-degrading enzyme activities in pulp of harvested longan fruits were investigated. This study aimed to determine the relationship between inhibition of longan cell wall metabolism by heat treatment and aril breakdown for achieving the control of aril breakdown and prolonging the storage period of harvested longan fruits. The harvested longan (cv. Fuyan) fruits were pre-treated with hot-water at 50°C for 10 minutes, air dry, and then packed into sealed polyethylene bags (0.015 mm thickness) and stored at (15±1)°C for 10 days. Aril breakdown condition was observed, cell wall component contents and cell wall-degrading enzyme activities in pulp of harvested longan fruits were determined regularly during the storage. The results showed that aril breakdown index constantly rose during storage, water-soluble pectin (WSP) content first increased and then decreased, contents of ionic-soluble pectin (ISP), covalent-soluble pectin (CSP), hemicellulose and cellulose decreased continuously. Activities of pectin pectinmethylesterase (PME) and cellulase (CX) rose at first but then declined. polygalacturonase (PG) activity reduced, and β-galactosidase (β-Gal) activity firstly fell and then went up in the pulp of the control treatment of harvested longan fruits. Compared with the fruits in the control treatment, HWT could significantly (P<0.05) inhibited the rise of aril breakdown index, reduced the activities of the PME, PG, β-Gal and CX, delayed the increase in the content of WSP and the decline in contents of ISP, CSP, semicellulose and cellulose. From the results, it can be concluded that aril breakdown and components of cell wall metabolism in the pulp of harvested longan fruits were closely related. PME, PG and CX played an important role in the early aril breakdown, and β-Gal and reactive oxygen may play an important role in the late aril breakdown. Furthermore, the study also showed that HWT can reduce the degradation of the cell wall components by reducing cell wall-degrading enzyme activities in the pulp of harvested longan fruits, which helped to maintain the integrity of the cell wall structure, slowed down the leakage of cellular contents, and inhibited the occurrence of aril breakdown. The results provided reference of heat treatment for freshness-keeping of harvested longan fruits.

[查看全文](#) [下载PDF阅读器](#)

关闭

您是第**7559450**位访问者

主办单位：中国农业工程学会 单位地址：北京朝阳区麦子店街41号

服务热线：010—65929451 传真：010—65929451 邮编：100125 Email: tcsae@tcsae.org

本系统由北京勤云科技发展有限公司设计