

Pre-cut NaCl solution treatment effectively inhibited the browning of fresh-cut potato by influencing polyphenol oxidase activity and several free amino acids contents

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Abstract

Enzymatic browning is an important issue affecting the quality and shelf life of fresh-cut potato. Previous research showed post-cut sodium chloride (NaCl) dipping treatment doesn't have anti-browning effect on fresh-cut potato. In this research, the influence of pre-cut NaCl solution treatment on browning, polyphenol oxidase (PPO) activity and amino acids contents in fresh-cut potato was investigated. The results showed that pre-cut NaCl solution treatment at 5 % for 3 h improved the overall visual quality, reduced browning and surface dehydration and extended shelf-life by 3–4 d at 5 °C. The PPO activity in pre-cut NaCl treated potato tubers and slices was lower than that in control and water treated ones. Compared with control, the contents of glutamic acid and proline in NaCl treated potato were increased, whereas tyrosine and arginine decreased. Exogenous differential compensation of glutamic acid reduced the browning of control potato mash, while the compensation of tyrosine and arginine as well as their mixture aggravated the browning of pre-cut NaCl treated potato mash. The compensation of proline showed no influence on the browning of control potato mash, whereas pre-cut proline solution treatment inhibited the browning of fresh-cut potato. This research showed that pre-cut NaCl solution treatment can effectively inhibit the browning of fresh-cut potato by influencing polyphenol oxidase activity and several free amino acids contents, which provides a new way to prevent the browning of fresh-cut potato and elucidates the anti-browning mechanism of pre-cut NaCl treatment.