

Abstract

Jicama (*Pachyrizus erosus* L. Urban) is a plant native to Mexico and Central America where its root is eaten for its succulence and its sweet starchy taste. During its commercialization, as a whole or cut root, it is easily damaged, and brown areas appear on the root. This browning has been attributed to polyphenol oxidase (PPO) which acts on the phenols; nevertheless, the participation of other enzymes in the process has not been evaluated. The objective of this work was to relate the activity of PPO and peroxidase (POD) and the phenolics and lignin content during the development of browning on cut jicama stored at 10 and 20 °C for a week. Their color changes, phenolics and lignin content and the activities of PPO and POD on external as well as internal tissue were analyzed daily. After a week at 20 °C, the phenolic content, expressed as gallic acid in fresh tissue, increased from 0.37 to 1.04 g kg⁻¹ while the lignin content, expressed as coumaric acid, increased from 16.50 to 52.22 mg kg⁻¹. The lignin values were correlated with color changes expressed by chroma ($R^2=0.8765$). PPO and POD activities were induced by damage and were greater in the damaged external tissue than in the internal tissue; they were also influenced by temperature. POD was at a maximum on the sixth day of storage at 20 °C (7500 units of activity (UA) kg⁻¹). Coumaric, caffeic and ferulic acids, coniferaldehyde and coniferyl alcohol (precursors in lignin synthesis) proved to be good substrates for POD with K_m of 40.0, 89.4, 150.0, 44.1 and 580 μM, respectively. Results suggest that the browning of cut jicama at 20 °C is related to the process of lignification in which the peroxidase enzyme plays an important role.