

Title Biochemical changes and antioxidant activity of mango ginger (*Curcuma amada* Roxb.) rhizomes during postharvest storage at different temperatures

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Abstract

Mango ginger (*Curcuma amada* Roxb.) is a unique species having mango flavour in its rhizomes and is of high medicinal importance. Its shelf-life and quality is governed by storage temperature and time. The present study pertains to biochemical changes and antioxidant activity in mango ginger rhizomes during storage. No significant changes were observed in pH, titrable acidity and TSS of the rhizomes stored at different temperatures, viz. room temperature (RT, 25 °C), low temperature (LT, 14 °C) and chilling temperature (CT, 4 °C). Total protein decreased initially from 11.2 to 7.9 mg/100 g rhizome up to 70 days, followed by a rapid increase to 10.6 mg on the 120th day of storage at RT. In contrast, total protein content increased at LT from 10 days onwards. The highest accumulation of total phenolic contents from 20.8 to 57.4 mg/100 g rhizome in juice and from 380 to 568 mg/100 g in pulp was observed in LT storage. The DPPH scavenging activity of mango ginger juice and pulp decreased sharply to 30 and 33%, respectively at RT, when compared with a steady activity of around 56% in juice and 72% in pulp at LT. Mango ginger rhizome could be stored for 4–5 months at LT compared with 2–3 months at RT. Shrivelling and sprouting are the limiting factors for further storage at RT, and the threshold percentage of water loss ranging from 30 to 36% was responsible for commercially objectionable levels of shrivelling. Within the range of temperatures, rhizomes exhibited chilling injury symptoms as water-soaked lesions with tissue softening, browning, loss of mango flavour and failure to sprout at the lowest temperature (CT), and rapid deterioration of physical, physiological and antioxidant properties at room temperature. Moderate low temperature (LT) minimized the biochemical changes, maintained or increased the antioxidant activity and doubled the shelf-life as a function of temperature with storage time.