

**Postharvest quality of chilling injured ginger rhizomes (*Zingiber officinale* Roscoe cv. Bentong) as affected by maturity stages, storage temperatures, and durations**

**ABSTRACT**

Ginger (*Zingiber officinale*) has been identified as one of the market potential herbs which have been used as a spice and traditional medicine throughout the world. It contains phenolics, terpenes, flavonoids, which harnesses an incredible healing power proven for a host of ailments. Storage life and usage of ginger are limited as it is susceptible to chilling injury (CI). Maturity stages, varieties, storage durations and temperatures, and environment influence occurrence of CI in ginger rhizomes. Storage of rhizomes at ambient temperature leads to high moisture loss, shrivelling and sprouting, while storage below 12 °C causes CI and browning. Improper maturity stages at harvest caused reduction of ginger quality, decrease storage life and increase fiber and sprouting of rhizomes. The objective of this study was to characterize CI of ginger rhizomes as affected by maturity stages (7, 9 and 11-months after planting), storage temperatures (5, 15 and 25 °C) and storage durations (0, 8, 16, 24 and 32 days). Weight loss due to loss of moisture content was significantly higher in the gingers stored at ambient temperature (25 °C) than at 5 and 15 °C storage temperatures. Browning index at 5 °C storage increased as storage durations increased in all maturity stages of ginger, highest at 11-months, followed by 9 and 7-months, with browning indices of 0.98, 0.95 and 0.86, respectively. As browning increased, ginger pulp colour changed from yellow to light brown with a reduction in rhizomes firmness. Ginger under 5 °C storage showed the highest reduction in pulp firmness by 68%, 66% and 64% in 7, 9 and 11-months ginger, respectively, and rhizome turned soft and watery. As a conclusion, the 9-months ginger under 15 °C storage was selected as optimum maturity stage and storage temperature since these ginger exhibited minimum CI and postharvest quality was maintained after 32 days of storage.

**Keyword:** Browning; Colour; Firmness