

## **Effect of harvesting stages and calcium chloride application on postharvest quality of tomato fruits**

### **ABSTRACT**

Tomatoes are a good source of vitamins, minerals, antioxidants, and enzymes, which are beneficial to human health. They are one of the most commercially high-value vegetable crops that experience a huge postharvest loss after harvest. The present experiment is conducted to investigate the effect of different maturity stages (mature green, breaker, and half-ripe stage), pre- and post-harvest treatment with different concentrations (0.0%, 1.0%, 1.5%, and 2.0%, w/v) of calcium chloride (CaCl<sub>2</sub>) on the postharvest performance, antioxidant and enzymatic activity of lowland tomato fruits, stored at ambient temperature ( $28 \pm 2$  °C and  $75 \pm 5\%$  RH). Tomato fruit of mature green stage treated with 2% CaCl<sub>2</sub> significantly ( $p = 0.05$ ) declined the ethylene production (15.53%), weight loss (16.43%), and delayed color development by slowly synthesizes the lycopene content as well as extended the shelf life. The maximum amount of total phenolic content (TPC) was demonstrated at the highest level of CaCl<sub>2</sub> (2%) after 20 days of storage life at ambient conditions. The concentration of CaCl<sub>2</sub> influenced the activity of different plant defense enzymes, and the higher doses of CaCl<sub>2</sub> (2%) accelerated the activity of peroxidase (POD) (13%), polyphenol oxidase (POP) (7.3%), and phenylalanine ammonia-lyase (PAL) (8.5%) relative to that of the control samples. Therefore, the tomato producers and traders could extend the storage duration of tomato fruits by harvesting at the mature green stage and applying 2% CaCl<sub>2</sub> in both pre-and postharvest at ambient storage conditions.

**Keyword:** Tomato; Harvesting stages; Calcium chloride; Quality; Antioxidant; Enzyme activity; Shelf life