

## Enhancing disease resistance and improving quality of papaya (*Carica papaya* L.) by postharvest application of silicon

W.M.K.I. Bandara<sup>1\*</sup>, O.D.A.N. Perera<sup>1</sup> and H.L.D. Weerahewa<sup>2</sup>

<sup>1</sup> Department of Food Science and Technology, Faculty of Livestock, Fisheries and Nutrition, Wayamba University of Sri Lanka, Makandura, Gonawila (NWP), Sri Lanka;

<sup>2</sup> Department of Botany, Open University of Sri Lanka, Nawala, Sri Lanka.

\*Corresponding author (email: wmkibandara@gmail.com)

Papaya (*Carica papaya* L.) is a less firmer fruit with high nutritional value and susceptible to many diseases especially anthracnose, causing higher postharvest losses. The purpose of this study is to investigate the effect of postharvest application of silicon on anthracnose disease development, physicochemical characteristics and the shelf life of papaya fruits.

Mature fruits were harvested at colour breakage stage from a papaya garden located in Kuliyapitiya area. They were washed using clean water and dipped in 0, 1000, 2500, 5000 and 7500 mg/L solutions of Sodium silicate for 20 min and subsequently fruits were air dried. Fruits were inoculated with *Colletotrichum gloeosporioides* by placing 25 µl drops of spore suspension at three different places along the longitudinal axis of each papaya fruits. Spore suspension was prepared using a pure culture of the organism, isolated by Anthracnose disease containing papaya fruits. The concentration of the spore suspension was adjusted to  $10^5$ - $10^6$  per mL. After, the fruits were kept in moisture chamber, area of inoculated spot, physico-chemical parameters; fruit firmness, Brix (Total Soluble Solid), pH and titrable acidity of fruit juice were measured at full ripening (CI-6) stage. Shelf life of papaya fruits were also measured calculating no of days at full ripening stage. However, there was no significant effect observed on Brix, pH and titratable acidity of silicon treated fruits compared to untreated control. But, silicon was affected on fruit firmness and it was increased with increasing Sodium silicate concentration. There was a significant ( $P<0.05$ ) reduction (50-60%) in disease development in fruits treated at 5000 mg/L and 7500 mg/L sodium silicate compared to control fruits. The shelf life was increased up to 4-5 days in fruits treated at 2500 and 5000 mg/L sodium silicate compared to control fruits. In conclusion, postharvest dip treatment at 5000 mg/L sodium silicate has significantly ( $P<0.05$ ) reduced the anthracnose disease development and increased the shelf life and quality of the fruits.

**Keywords:** Papaya; sodium silicate treatment; shelf life; anthracnose