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'Competing pathways for equitable food systems transformation: trade-offs and synergies'

Fresh strawberry (*Fragaria* × *ananassa*) and jamun (*Syzygium cumini*) fruit physico-chemical, antioxidative and organoleptic quality management by organic acid application.

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Background and Objectives

Fresh fruits significantly contribute to global nutritional security. However, fresh horticultural produce especially fruit is highly perishable and the global postharvest losses account for 30 to 40%. Use of organic compounds with the acidic properties had been widely reported to retain postharvest quality of fresh fruit. Therefore the objective of the study was to explore the role of oxalic acid (OA) and quinic acid (QA) on postharvest quality management of strawberry and jaman fruit.

Methodology

An integrated study was executed to explore the pre-harvest and postharvest application of QA and OA on strawberry cv. (Chandler) and jamun cv. (Desi) fruit at shelf. Experiment-I & -II investigated pre-harvest and postharvest OA-application (0, 0.5, 1 and 2 m*M*) on jamun fruit quality, while experiment-III examined postharvest application of QA (0, 0.25, 0.5 and 1 m*M*) on strawberry fruit quality. All the treated fruit were kept at ambient conditions (25± 2 °C and 60-65% RH) and were investigated for physico-chemical, antioxidative and organoleptic quality attributes on daily basis.

Results

Strawberry fruits treated with 0.50 mM QA showed maximum vitamin C at day-4, while QA dose of 1mM retained highest antioxidant and total phenolic content (Fig. 1). At the end of storage, treated strawberry fruit with QA retained higher antioxidant enzymatic activities [catalase (CAT) and superoxide dismutase (SOD)] as shown in Fig. 2.

Combined application of 2mM OA at pre + post-harvest level significantly reduced jamun fruits weight loss and retained higher total phenolic contents (TPC) and antioxidant activity as compared to untreated fruit (Fig 3 & 4).

Similarly, when OA was applied at post-harvest level only, jaman fruit treated with 4 mM retained higher antioxidant activity and TPC and also exhibited lower fruit weight loss as compared to untreated jaman fruit and fruit treated with other doses (Fig 5&6).

Conclusions

Postharvest application of 0.5 mM QA and combined application of 2 mM OA at pre- + postharvest level retained strawberry and jaman fruit quality during shelf after harvest, respectively.

Organic acid can be used either as pre-harvest or postharvest level to retain fresh fruit quality after harvest.

Acknowledgements

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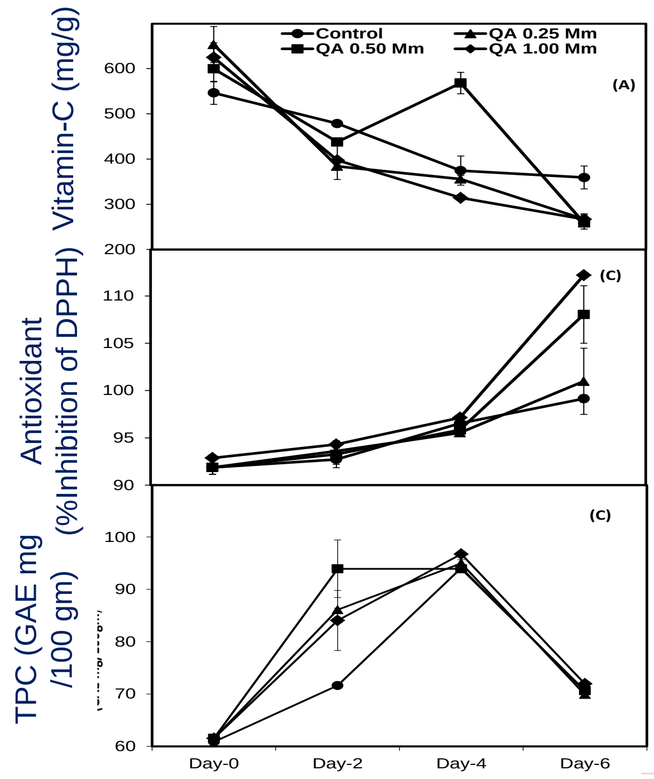

Fig. 1: Impact of quinic acid on Vit-C (a Antioxidant (B) and TPC (C) in strawberry cv "Chandler "at shelf conditions.

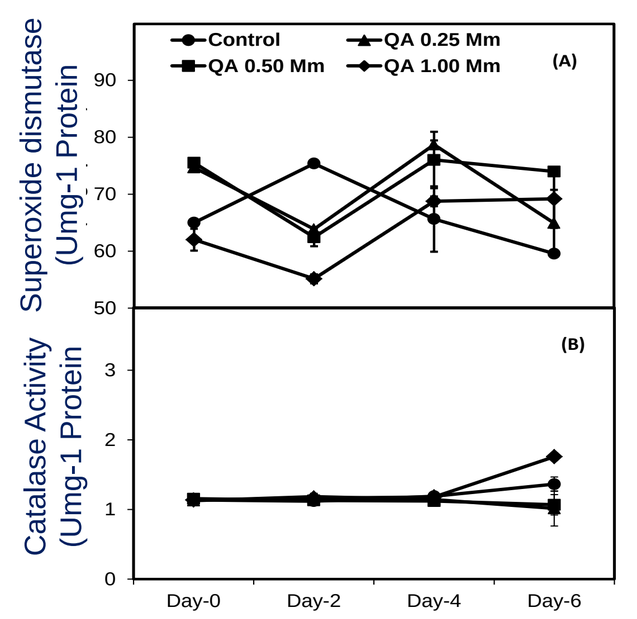

Fig. 2: Impact of quinic acid Superoxide dismutase (A) and catalase activity (B) in strawberry cv. "Chandler" at shelf conditions.

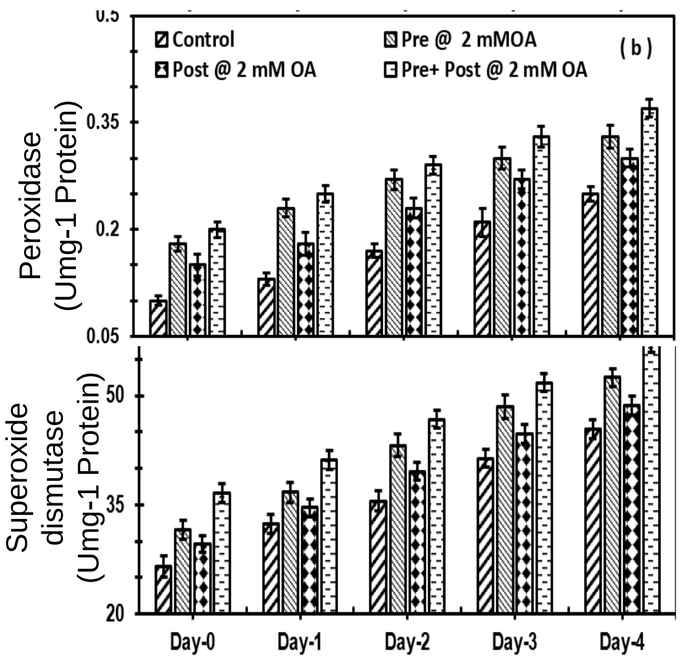

Fig. 3: Effect of Oxalic Acid on peroxidase and superoxide dismutase in Jamun fruit at pre-harvest level.

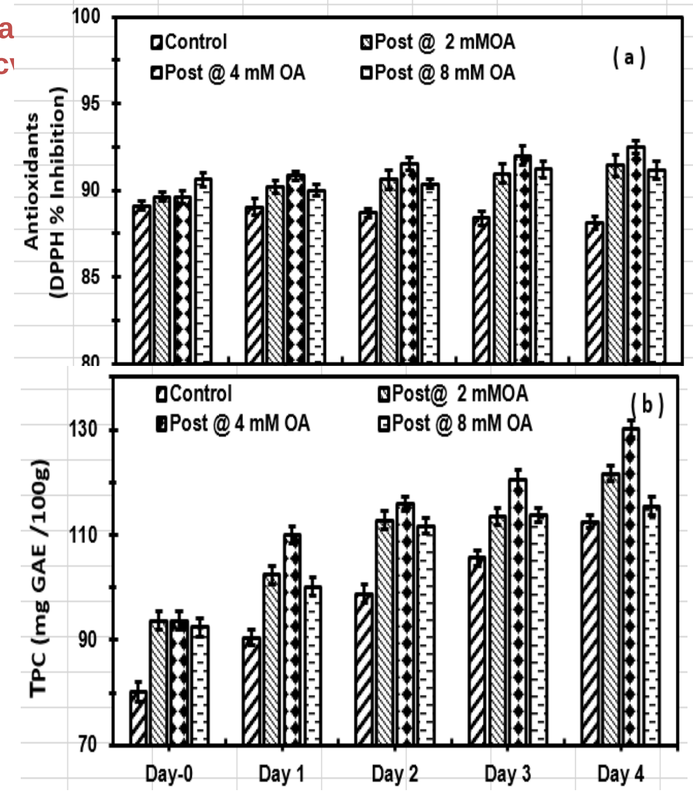

Fig. 5: Effect of Oxalic Acid on Antioxidant (a) and TPC (B) in Jamun fruit at post-harvest level.

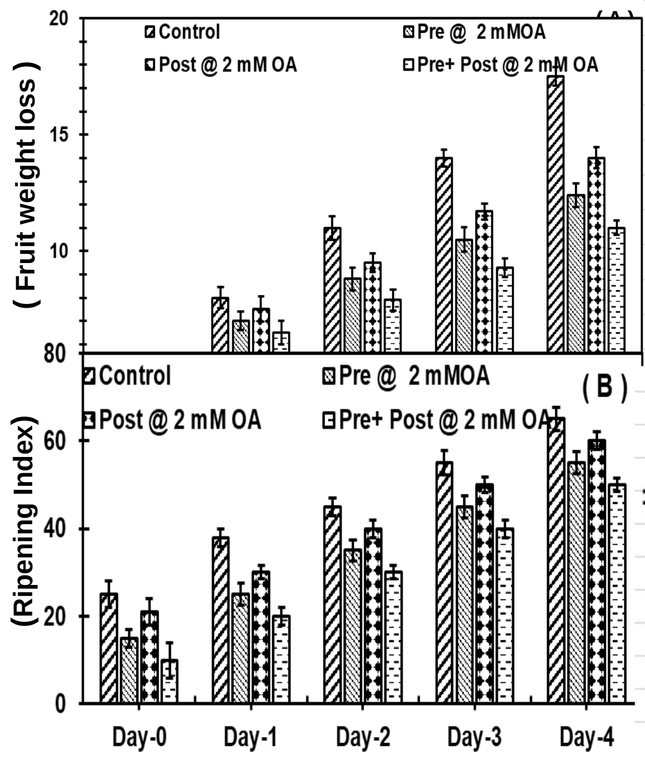

Fig. 4: Effect of Oxalic Acid on weight loss and Ripening index of Jamun fruit at pre-harvest level.

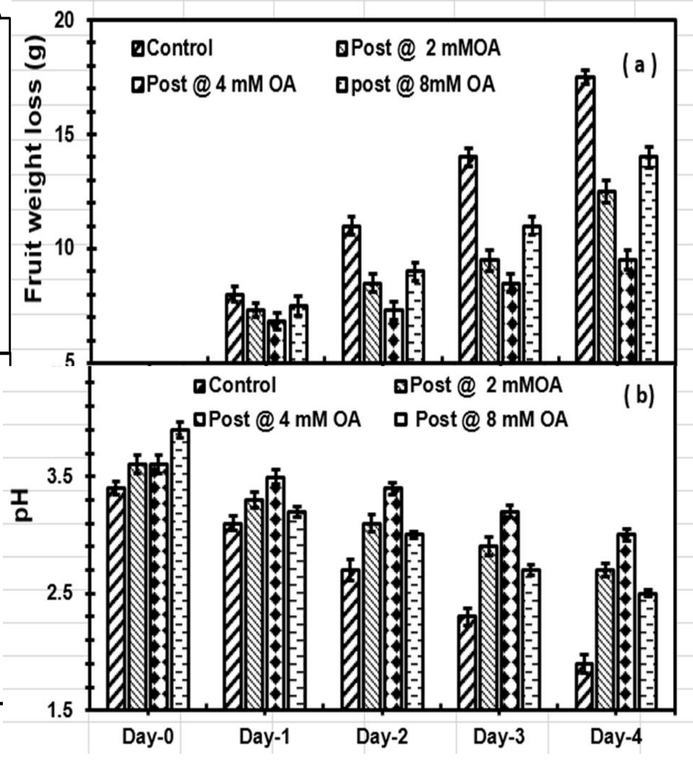

Fig. 6: Effect of Oxalic Acid on weight loss and Juice pH of Jamun fruit at post-harvest level.