

Thesis Title	Pre- and Post-harvest Application of Salicylic Acid and Sodium Nitroprusside for Maintaining Postharvest Quality of Mango
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ABSTRACT

Mango fruit have a high nutritional value and are beneficial to health. However, losses frequently occur after harvest, because they are perishable. Salicylic acid (SA) has been used to preserve fruit quality and maintain their nutritional contents. Therefore, this study was conducted to investigate the effects of 2 mM SA on the physicochemical properties, bioactive compounds, antioxidant and anti-inflammatory activities of mango fruit (*Mangifera indica* L. cv 'Nam Dok Mai Si Thong'. For this purpose, mango fruit were given preharvest (Pre SA) or postharvest applications of SA (Post SA) and their combination (Pre + Post SA); the fruit were stored at 13 °C for 20 days. Weight loss, decay, and 2,2-diphenyl-1-picryl-hydrazyl-hydrate (DPPH) radical scavenging activity were maintained in SA-treated fruit. The Pre + Post SA treatment was superior in delaying fruit ripening, maintaining lower soluble solids contents and higher total acidity. In addition, total phenolic compounds (TPC), ferric reducing antioxidant power (FRAP), and free radical scavenging activity of anti-inflammatory substances such as nitric oxide as well as hyaluronidase inhibition was higher in the Pre + Post SA treatment throughout storage. Therefore, both pre- and post-harvest SA

treatments are recommended for preserving the quality of mango fruit and for maintaining their nutritional properties for human health.

Nitric oxide (NO) has been reported to delay ripening and maintain fruit quality as well as SA. In this study, the effects of applying 1 mM sodium nitroprusside (SNP), a NO donor, on the ripening-related properties, bioactive compounds, and antioxidant and anti-inflammatory properties of 'Nam Dok Mai Si Thong' mango were investigated. For this study, mango fruits were treated at preharvest with SNP (Pre SNP), postharvest with SNP (Post SNP), and at preharvest and postharvest with SNP combinations (Pre + Post SNP). All mango fruits were stored at 13°C, with 80–85% RH for 20 days before quality determination. SNP-treated fruit maintained the changes in total color differences, firmness, soluble solids content (SSC), and total acidity (TA), and averaged 4% less weight loss and 60% lower decay than those of the control fruits through day 20. In addition, Pre + Post SNP showed significantly increased TPC, DPPH radical scavenging activity, FRAP, and anti-inflammatory activity such as hyaluronidase inhibition activity compared to the other treatments. The application of SNP in pre and postharvest treatments enhanced mango fruits' bioactive compounds, antioxidants, and anti-inflammatory activities.

Keywords: Antioxidant, Anti-inflammatory, Mango Fruit, Nitric Oxide, Salicylic Acid, Sodium Nitroprusside