Tropentag, September 16-18, 2026, hybrid conference

"Towards multi-functional agro-ecosystems
promoting climate resilient futures"

Postharvest fruit losses and management in fresh jamun (*Syzigium cumini*) berry supply chains and domestic market efficiency in Pakistan

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Abstract

Jamun (*Syzygium cumini*), commonly known as java plum, is a tropical to subtropical fruit tree that remains underutilised in Pakistan, where it is primarily grown as boundary or shelterbelt planting with limited commercial orchards. Despite its high nutritional and medicinal value and potential for processing, the fresh jamun industry faces significant postharvest challenges, including substantial physical and weight losses due to improper handling, high perishability, short shelf life, and disease incidence.To address these issues, a comprehensive research study funded under the HEC NRPU programme was conducted over three years. In Year I, postharvest losses were quantified across the supply chain, varietal quality was assessed, and preliminary interventions were introduced. Year II focused on managing quality deterioration through pre- and postharvest applications of ripening-delaying treatments, particularly citric acid (CA), and on developing value-added products such as pulp leather and jam, which were evaluated for nutritional and sensory attributes. In Year III, market and consumer studies were conducted, alongside investigations into postharvest diseases, including pathogen identification and validation of quality management practices. Results indicated strong consumer acceptance of jamun and high market potential for processed products, with preferences for medium-sized, affordable packaging. Postharvest treatments with 2 mM citric acid significantly reduced weight loss, preserved total soluble solids, delayed acidity decline, and maintained ascorbic acid content. Combined pre- and postharvest applications were most effective in sustaining quality and regulating juice pH. Overall, the study demonstrates the commercial viability of jamun products and the effectiveness of citric acid treatments in reducing postharvest losses and enhancing shelf life.

Keywords: Fruit quality, horticulture, local market, pomology

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