

Pathogenicity of Stem-end Rot Associated Fungi Isolated from Karthakolomban Mango and Their Control by Spray and Fumigation Treatments with Selected Essential Oils

T. D. Kodituwakku¹, K. Abeywickrama^{1*} and K. O. L. C. Karunanayake²

Received: 8th May 2019 / Accepted: 20th June 2019

ABSTRACT

Purpose: Stem-end rot (SER) is a major disease of mango that causes serious postharvest losses. Application of fungicides is environmentally unsound and is being practiced currently in its control. This study was conducted to develop essential oil treatment systems as eco-friendly strategies to control SER of Karthakolomban mango and to determine the pathogenicity of several SER associated fungi.

Research Method: Pathogenicity of four fungal isolates in SER was assessed by inoculating them on Karthakolomban mango fruits. Karthakolomban mango fruits were subjected to spray and fumigation treatments using four essential oils and their pathological, physicochemical and sensory properties were evaluated after a 8-day storage at 12 – 14 °C.

Findings: *Lasiodiplodia theobromae*, *Pestalotiopsis* sp., *Phomopsis* sp. and *Xylaria feejeensis* were the major SER pathogens of mango. *X. feejeensis* was identified as a SER pathogen for the first time in Sri Lanka. Spray and fumigation treatments conducted using basil, clove, cinnamon leaf and cinnamon bark oils effectively controlled SER of Karthakolomban mango stored at 12 – 14 °C for 8 days. Mango sprayed with 1.6 µL/mL cinnamon bark oil has displayed no SER after induced ripening. None of the treatments caused drastic alterations in physicochemical and sensory properties of mango.

Research Limitations: Storage period of mango was restricted to 8 days due to the initiation of natural ripening which was the major limitation to achieving a further enhanced shelf life.

Originality/value: The treatment strategies developed by this research could be commercialized as bio-safe SER control strategies in reducing postharvest losses of mango in the local and international trade.

Keywords: Essential oils, fumigation, mango, pathogenicity, spray, stem-end rot

INTRODUCTION


Mango (*Mangifera indica* L.) is one of the most renowned tropical fruits consumed worldwide due to its delightful taste and higher contents of certain nutrients like vitamins A, B, C and fiber. Karthakolomban is one of the superior varieties of mango popular among growers as well as consumers in Sri Lanka due to its unique flavour and high nutritional value (Kothalawala and Jayasinghe, 2017). Highly perishable and delicate nature of mango fruits make them susceptible to postharvest damages, causing serious losses. About 20 – 25% of mango are

wasted because of the inappropriate harvesting, packaging and storage practices (Singh *et al.*, 2014). Any postharvest deterioration may result in mangoes with an undesirable quality and a shortened storage life, which will result in rejection of the fruit from the market (Alemu,

^{1*}Department of Botany, Faculty of Science, University of Kelaniya, Kelaniya, Sri Lanka.

kris@kln.ac.lk

²Department of Botany, Faculty of Natural Sciences, The Open University of Sri Lanka, Nawala, Sri Lanka.

 <https://orcid.org/0000-0001-6562-3151>