

STUDY ON THE POST HARVEST MANAGEMENT AND STORAGE BEHAVIOUR OF APPLE (MALUS DOMESTICA L.)

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ABSTRACT

The present piece of research work was carried out in the Horticultural Laboratory of the Faculty of Agriculture and Life Sciences at Desh Bhagat University, Mandi Gobindgarh, District Fatehgarh Sahib, Punjab in the months of January to May, 2024. Seven treatments viz. T₀ = Control, T₁ = Aloe vera gel – 5%, T₂ = Neem oil– 5%, T₃ = Eucalyptus oil - 5%, T₄ = Cinnamon -5%, T₅ = Mint oil – 5%, T₆ = Lemongrass oil– 5% were taken to study the shelf life of apple and all treatments replicated thrice. Results of experimentation revealed that Aloe vera gel exhibited highest value of Total Soluble Solids (TSS) and Lemongrass oil exhibited highest ascorbic acid ratio. Eucalyptus treatment showed highest vitamin C during storage and proved to be best treatment for maintaining quality and extending shelf-life due to least lost in weight, decay percentage, higher titratable acidity in Mint oil, and highest juice recovery percentage in Neem oil during storage period apple fruit. The antimicrobial activity of essential oils, useful to control fungal pathogens. The present study initiated with the aim to observe the effectiveness of various oils to increase the shelf life and protect the fruit from various diseases.

KEYWORDS – Eucalyptus, Cinnamon, titratable, senescence.

1. INTRODUCTION

Apple belongs to the family Pomoideae (Korban and Skirvin, 1984). There are several factors that can be used to presume the quality of apple including mechanical, chemical, sensory, and physical properties. Postharvest diseases affect a wide variety of crops particularly in developing countries which lack sophisticated postharvest storage facilities (Jeffries and Jeger, 1990). Due to the mechanical handling of apple fruits, its surface can harbor microorganisms which can attach to the surface or invade the fruits and multiply within its tissues (Oranusi and Wesley, 2012). Extending the shelf life can lead to the reduction in fruit losses, while preserving fruit quality, flavor, and texture. The use of edible coatings, which allows the creation of a physical barrier around the fruits by means of natural additives, can be considered as a valuable technique to extend the shelf life of organic fruits. Among the natural substances able to be used against fruit postharvest decay, essential oils (EOs) proved to be more beneficial in recent years due to their antimicrobial, antibacterial, antiviral, biodegradable, and eco-friendly properties.

2. MATERIALS AND METHODOLOGY

The Research was conducted on the postharvest management and storage behavior of Apple in the Horticulture Laboratory of Faculty of Agriculture and Life Sciences, Desh Bhagat University, Mandi Gobindgarh, Punjab from January to June, 2024. The healthy apple fruits were procured from the market and the oils viz., Aloe vera, Neem oil, Eucalyptus oil, Cinnamon oil, Mint oil, Lemongrass oil applied on different lots i.e., T₁, T₂, T₃, T₄, T₅ and T₆ respectively. All the fruits were randomly selected and grouped in seven lots followed by thorough cleaning with fresh water. Each lot contain three apples. Four lots are maintained in a refrigerator under controlled conditions while three lots are left at ambient temperature. Four lots were placed in refrigerator at 5°C. Control (A1, A2, A3) is in the first lot and marked as T₀ : Cleaned fruits were placed and left open at room temperature without any kind of care. Aloe vera (A4, A5, A6) is applied to the second lot and marked as T₁. Neem oil (A7, A8, A9) is applied to the third lot and marked as T₂. Eucalyptus oil (A10, A11, A12) is applied to the fourth lot and marked as T₃. Cinnamon oil (A13, A14, A15) is applied to the fifth lot and marked as T₄. Mint oil (A16, A17, A18) is applied to the sixth lot and marked as T₅. Lemongrass oil (A19, A20, A21) is applied to the seventh lot and marked as T₆. Before being stored, fruits are dipped in hot water to prevent different postharvest illnesses and to improve the fruit's skin color.

3. RESULT

No decay loss was noticed during 4th and 5th day of observation. Decay occurred during 12th day on control treatment. Similar observations were recorded in other treatments like T₁, T₂, T₃, T₄, T₅. The highest total soluble solids were observed in T₁ and maximum juice recovery was found in T₂. In T₃, highest vitamin C, least decay, less lost in weight was observed while maximum ascorbic acid was observed in T₆. Hassanavi et al. (2023) revealed in their study that essential oils as post harvest treatment under optimized storage conditions can be utilized as a low - cost substrate for controlling post harvest decay in apple.

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