

Investigate the Impact of Temperature Variation on Quality of Banana Fruits during Artificial Ripening

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Ripening includes physiological, biochemical and organoleptic changes in fruits leading to soft and edible commodities with appropriate quality characteristics. Commercially fruits are artificially ripened using various chemicals, and use of ethephone in low cost ripening chambers is a popular method in Sri Lanka. However, some qualitative defects have been reported in bananas “*Embul*” (Musa, AAB) that are ripened in ripening chambers provided by the National Institute of Post-Harvest Management. Hence this study was carried out to investigate the impact of temperature variations on physicochemical properties (pulp firmness, total soluble solid, titratable acidity, weight loss) and to suggest modifications for the ripening chambers to maintain temperature. In this study artificial ripening of approximately 30-50 kg of banana fruits ripened using ethrel treatment (using 10 g calcium carbonate and 1 ml ethrel in 2 liters of tap water) in different agro-climatic locations (Anuradhapura, Kothmale, and Mullaitivu) in Sri Lanka were investigated. Temperature variation inside and outside of the chamber and loaded fruits (24 hours) were recorded during ethylene treatment and changes in physicochemical properties of fruits during ripening were tested (in triplicate) in one-day intervals until table ripe stage in triplicates. The data were analyzed by one way ANOVA. According to results there were significant differences ($p < 0.05$) among locations with highest mean of total soluble solids (27.73 ± 0.15), lowest mean of titratable acidity (0.22 ± 0.03), lower mean of weight loss (8.293 ± 0.3) and highest mean of firmness (0.43 ± 0.03) was observed on 3rd day of storage in fruits ripened in Anuradhapura. Results revealed that banana ripened in Anuradhapura (22.5 °C) has the optimum quality during ripening in comparison to other two locations Kothmale (18.87 °C) and Mullaitivu (28.82 °C). Hence, maintenance of optimum temperature during ripening is essential to obtain the quality product. Therefore, modifications to the existing chambers were applied by introducing an air inlet fan (as a ventilation system) and a heating system to prevent the temperature fluctuations during ripening.

Keywords: Ethylene treatment, Fruit ripening, Quality, Ripening chamber