OPTIMIZING THE LEVEL OF 1-METHYLCYLOPROPENE TO EXTEND THE SHELF LIFE OF PAPAYA (*Carica papaya*) cv "TAINUNG" AT COLD STORAGE

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Post-harvest life of papaya is short due to its rapid ripening rate. Application of 1-Methylcyclopropene can be used to extend the postharvest life of fruits. This study was conducted to investigate the effect of different concentrations and exposure time of 1-MCP on delaying ripening of 'Tainung' papaya. Fruits were treated with 1-MCP with four different treatments [(1 ppm –12 h (T_1), 1 ppm – 24 h (T_2), 2 ppm – 12 h (T_3), 2 ppm – 24 h (T_4)] in hermetically sealed chambers at ambient conditions while control was untreated. All fruits were stored in at 15 °C and 85% relative humidity. Physicochemical properties (peel colour, pH, titratable acidity (TA), total soluble solids (TSS), pulp firmness, chlorophyll content) and physiological weight loss were examined at the four-day interval for 36 days. The experiment was arranged as a two-factor factorial Completely Randomized Design. Twenty days after storage control reached the table ripened stage. At twentieth day T_4 showed significantly lower ($p<0.05$) L*, a* and b* value of peel colour (41.37 ± 0.76, 36.16 ± 0.73 and -12.54 ± 0.64, respectively) compared to the control (L*, b*, a* = 60.79 ± 0.87, 51.37 ± 0.66 and 8.71 ± 0.78, respectively). Significantly lower ($p<0.05$) TSS and pH value (8.27 ± 0.23 and 5.62 ± 0.02, respectively) were observed in T_4 compared to the control (12.6 ± 0.47 and 6.12 ± 0.09, respectively) on 20th day. At the 36th day, there was no significant difference ($p>0.05$) in TA between treatments. The control showed significantly higher ($p<0.05$) physiological weight loss 14.49% compared to T_4 (8.41%). Significantly higher ($p<0.05$) chlorophyll content was observed in T_4 (0.7 $mgml^{-1}$) compared to T_2 (0.4 $mgml^{-1}$); significantly higher firmness retention was observed in T_4 treatment (72.08 ± 0.78 N) compared to T_1 (64.48 ± 0.85 N). Hence, 1-MCP could be used effectively in delaying ripening of 'Tainung' papaya.

Keywords: Concentration, Exposure time, 1-Methylcyclopropene, Shelf life extension, 'Tainung' papaya