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Efficacy of 1-Methylcyclopropene (1-MCP) in Purple Passion (*Passiflora edulis* Sims) Fruits as Affected by Dosage and Maturity Stage

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Desert Salon 9-10 (Desert Springs J.W Marriott Resort)

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An inhibitor of ethylene action, 1-Methylcyclopropene (1-MCP), has been widely used in many countries to slow down ripening and deteriorative processes climacteric fruits, thereby extending the postharvest shelf life. Its application in some countries like Kenya is limited due to lack of studies to determine its efficacy and effect on fruit quality. This experiment sought to establish the efficacy of 1-MCP treatment in purple passion fruit (*Passiflora edulis*, Sims), one of the major fruits produced in Kenya for domestic and export market. The 1-MCP was separately applied following 2 regimes—2 ppm for 24 hours and 4 ppm for 12 hours to passion fruits—which were harvested at two stages of maturity. The stages of maturity were defined by the peel color as; stage 1, mature green (less than 25% purple) and stage 2 (50% to 75% purple). After 1-MCP treatments, fruits were left to ripen at ambient room conditions, 25 ± 1 °C and $60\% \pm 5\%$ relative humidity (RH) alongside untreated controls. During the storage period, six fruits from each treatment combination were randomly sampled every two days to evaluate physiological changes including ethylene evolution, respiration rate, and weight loss. Physicochemical parameters associated with ripening including hue angle, total soluble solids (TSS), total titratable acidity (TTA), major sugars (glucose, fructose, and sucrose) and mineral nutrients (calcium, iron and potassium) were also evaluated. The experimental design used was a completely randomized design with a factorial arrangement. Results show that 1-MCP treatment (both regimes) significantly ($P < 0.05$) reduced the rate of most of the changes associated with passion fruit ripening, irrespective of stage of maturity. There was a delay in ethylene peaks by at least 3 days and reduced ethylene evolution rate in treated fruits. Similarly, significantly lower respiration rates and delayed respiration climacteric peaks (up to 4 days) were observed in 1-MCP treated fruits. Other ripening-related physicochemical changes correlated positively with