

**FEASIBILITY OF SOLAR EVAPORATIVE COOLING DEVICE FOR  
ARTIFICIAL RIPENING OF MANGO (*Mangifera indica*) IN  
COMPARISON WITH NATURAL AND CONVENTIONAL RIPENING  
METHODS**

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Different structures that are used for artificial ripening, perform differently. This study was conducted to evaluate the feasibility of solar evaporative cooling device for artificial mango ripening. The unripe mature mangoes (cv. *Karuthakolomban*) were ripened using the solar evaporative cooling device and a conventional ripening chamber, for 24 hours after ethephon treatment (ethephon and CaOH<sub>2</sub>, 1:1 ratio, 400ml/m<sup>3</sup>) in gaseous form in comparison with natural ripening under ambient conditions. Temperature and relative humidity of each environment were measured. Mango samples were analyzed for changes in firmness, total soluble solids, titratable acidity, pH, pulp colour, respiration rate, and disease incidences. A significantly higher relative humidity was recorded in the solar evaporative cooling device (95 ± 3%) ( $p < 0.05$ ) which was desirable for fruit ripening. The conventional ripening chamber exhibited a higher fluctuation in temperature (range 24-30°C), but in solar evaporative cooling device it ranged between 24-26°C ( $p < 0.05$ ) which was desirable for mango ripening. Mango ripened in solar evaporative cooling device had significantly higher total soluble solids (19.13 °Brix) ( $p < 0.05$ ) and lower firmness (0.57N) ( $p < 0.05$ ) than conventional and natural ripening. The highest increment rate of pulp colour in terms of b\* value showed in natural ripening ( $p < 0.05$ ). Higher disease incidences of stem-end rot and anthracnose were observed in both conventional chamber and solar evaporative cooling device ( $p < 0.05$ ). There was no significant difference ( $p > 0.05$ ) in pH, pulp colour in terms of L\* and a\* values, titratable acidity, and respiration rate among the ripening methods. Early ripening of mango was observed in the conventional ripening chamber and solar evaporative cooling device. No significant difference ( $p > 0.05$ ) was observed between mangos ripened in the two ripening chambers in the sensory evaluation conducted six days after ethylene treatment. Therefore, the results conclude that, solar evaporative cooling device can also be successfully used to ripen mangoes.

**Keywords:** Conventional method, Natural ripening, Relative humidity, Temperature.