

THE EFFECT OF TEMPERATURE AND ETHYLENE ON RIPENING  
OF BANANA AND TOMATO

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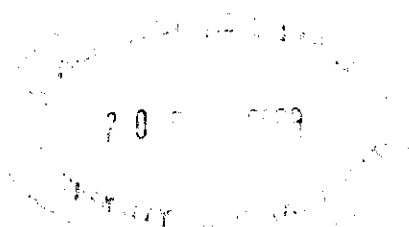
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## ABSTRACT

In view of reducing post harvest losses of highly perishable Sri Lankan banana variety embul and tomato varieties marglobe, T<sub>245</sub> & T<sub>146</sub>, treatments of ethylene and temperature were applied individually and in combination, to the fruits harvested at selected maturity levels (C-1). Based on statistically analyzed physico-chemical and organoleptic qualities, the following were observed:

Mature green stage fruit firmness (0.93 K. Pa.), pH (5.32), content of total soluble solids (5.5%), malic acid (0.23 g/100g pulp) & ascorbic acid (3.55 mg/100g pulp) of banana changed significantly (into 0.07 K. Pa., 4.24, 25.6%, 0.71 g/100g pulp & 1.15 mg/100g pulp respectively) after ripening, at table ripe stage, while only fruit firmness changed significantly from mature green stage (1.39 K. Pa) to table ripe stage (0.71 K. Pa) in tested tomato varieties.

An inverse relationship between content of malic acid & pH in banana and citric acid & pH in tomato was observed, in ethylene treated ripening at ambient conditions of  $29 \pm 4$  °C &  $61 \pm 5\%$  RH. Although organoleptic quality of banana was not affected, organoleptic quality of tomato was favourable in ethylene treated fruits. For ripening of banana cv embul, stimulation at 2 ppm ethylene was favourable with highest pH of 4.29 & lowest content of malic acid of 0.72 g/100g pulp, while 20 ppm was good for quick market requirements with highest content of ascorbic acid of 1.03 mg/100g pulp & highest peel colour development. For tomato cv marglobe & T<sub>245</sub>, 10 ppm ethylene & for tomato cv T<sub>146</sub>, 40 ppm ethylene was favourable for stimulation of ripening.

In temperature treated ripening of banana cv embul, yellowness of peel was higher in temperature stimulated fruits, compared to fruits in control, while in tomato cv T<sub>245</sub>, fruits stimulated at 20 °C showed highest redness, compared to 15 °C and the control. However, no effect of temperature on peel colour was observed in tomato cv marglobe. Highest content of total soluble solids of 28% and malic acid of 0.74 g/ 100 g pulp, were, observed at the temperature treatment of 17 °C, in banana, while highest content of total soluble solids of 4% was observed at 20 °C, in tomato cv T<sub>245</sub>. Organoleptic quality of banana was not affected by temperature treatment. Peel colour of tomato cv T<sub>245</sub> and consumer acceptability of tomato cv marglobe, were higher at 20 °C, compared to 15 °C and non stimulated control. Thus, the 17 °C temperature treatment, for banana and 20 °C for tomato cv marglobe & T<sub>245</sub>, were more favourable.

In combined treatment of temperature and ethylene, statistically non significant highest peel colour was observed at 21 °C with 2 ppm ethylene, in banana cv embul. Tomato cv marglobe & T<sub>245</sub>, developed highest redness, at 20 °C temperature with 10 ppm ethylene. Combined interacting temperature & ethylene effect was observed on content of malic acid of banana and percentage weight loss of tomato cv T<sub>146</sub>. In tomato cv marglobe, pH, content of citric acid, percentage weight loss and in tomato cv T<sub>245</sub>, total soluble solids, firmness, percentage weight loss were affected by temperature, while ethylene effect was absent showing higher influence of temperature, compared to ethylene. However in banana, effect of temperature & ethylene also was observed on physico-chemical parameters.

At 21 °C with 0.02 ppm ethylene, organoleptic quality was highest in banana, while highest score of estimated median of 7.75 in flesh colour, in tomato cv marglobe and 6.92 in aroma of tomato cv T<sub>245</sub>, were observed at 20 °C with 10 ppm ethylene. In tomato cv T<sub>146</sub>, organoleptic quality was higher at 20 °C with 40 ppm ethylene. Therefore, combined treatment of 20 °C with 10 ppm ethylene was favourable for tomato cv marglobe & T<sub>245</sub>, while for banana, temperatures of 17 & 21 °C with 0.02 ppm ethylene were favourable.

In the storage treatment of tomato cv T<sub>146</sub>, the fruits stored for 14 days at 13.5 °C, were equally good in quality after ripening, compared to the control.