

## Effect of Modified Atmospheric Storage on Internal Browning Development in Pineapple

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**ABSTRACT.** *The effect of modified atmosphere on internal browning development in pineapple cv Mauritius grown in Sri Lanka was studied.*

*Weighed fruits were sealed in polypropylene bags and stored at 8, 10, 20°C and room temperature (27-29°C). Biochemical parameters of fruits were recorded immediately after harvest and biochemical changes were determined at weekly intervals after removal of fruits from cold storage. Records were made on weight loss, shell and flesh colour, pH, total soluble solids, total titratable acidity, intensity of internal browning and ascorbic acid.*

*Fruits packed in sealed polypropylene bags and stored under cold storage at 8 and 10°C temperature showed a significant difference over the control in percentage of weight loss, ascorbic acid and intensity of internal browning. As storage period was extended to the third week, internal browning intensity increased and the fruits had an unacceptable odour, taste, and flavour. Shell colour did not change to bright yellow when fruits were stored at low temperatures of 8 and 10°C. However, development of yellow colour was enhanced after 10 days of storage at 20°C. Accelerated ripening and intense colour development of shell and flesh occurred at room temperature after one week of storage.*

*The total soluble solids (TSS) and ascorbic acid contents were maintained in fruits stored in sealed bags with minimum weight loss. Total titratable acidity of fruits which were sealed in polypropylene bags was also found to be lower than in the control fruits.*

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## INTRODUCTION

Internal browning, also known as endogenous brown spot and black heart, is an important physiological disorder of pineapple, caused by storage at chilling temperatures (Dull, 1971). The symptom of the internal browning is undetectable externally as the fruit appears normal (Teisson, 1979). Modified atmosphere and waxing treatment was found to be effective in controlling the development of such disorder at postharvest stage for kew cultivar (Rohrbach and Paull, 1982).

Farooqi *et al.* (1988) suggested that the weight loss of fruits in cellophane and polythene-lined containers was significantly lower than in wax paper, newsprint and tissue paper-lined containers. The use of polythene bags to control black heart development has additional advantages (Abdullah *et al.*, 1986). The incidence of symptoms associated with the black heart disorder of pineapples were also reduced by controlled atmospheric storage (Wijeratnam *et al.*, 1995).

The objective of this study was to investigate the effect of modified atmosphere on internal browning in pineapple *cv* Mauritius grown in Sri Lanka.

## MATERIALS AND METHODS

Pineapple fruits were weighed and sealed in polypropylene bags and stored at 8, 10, 20°C and room temperature (27-29°C). Evaluations on quality parameters of fruits were recorded immediately after harvest and quality changes were recorded at weekly intervals immediately after fruit removal from cold storage at different temperatures. A comparison was made with the control samples (without polypropylene bags) which were stored under the same conditions.

Records were made on percentage of weight loss, total soluble solids, pH, total titratable acidity and ascorbic acid. The scale of shell colour was from 0 to 5 where 0 = green and 5 = yellow or coppery red. Browning was scored separately for each fruit both on the basis of incidence and severity. The internal browning was 0 to 5 where 0 = none and 5 = complete browning.

## RESULTS AND DISCUSSION

Fruits packed in sealed polypropylene bags stored under cold storage at 8 and 10°C showed significant differences over the control in percentage of weight loss, ascorbic acid and intensity of internal browning. As storage period extended to the third week, internal browning intensity increased and the fruits had an unacceptable odour, taste and flavour. Shell colour did not change to bright yellow when fruits were stored at low temperatures of 8 and 10°C. However, development of the yellow colour was observed after 10 days of storage at 20°C. Accelerated ripening and intense colour development of shell and flesh occurred at room temperature after one week of storage.

The intensity of internal browning in fruits packed in sealed polypropylene bags was found to be lower than in the control fruits. The total soluble solids (TSS) and ascorbic acid contents were retained in fruits held in sealed bags while weight loss was minimized. Total titratable acidity of fruits which were sealed in polypropylene bags was found to be lower than in the control fruits.

## CONCLUSIONS

The results indicate that the use of polypropylene bags to store pineapple could delay and control internal browning to some extent.

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