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STUDY OF INTERNAL BROWNING AND SOME ASSOCIATED PHYSICO-CHEMICAL AND BIOCHEMICAL PARAMETERS IN TWO PINEAPPLE CULTIVARS DURING COLD STORAGE

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Internal browning is a physiological disorder, commonly encountered in pineapples during prolonged cold storage under low temperature (8-15 °C). 'Mauritius', the most popular dessert cultivar is more susceptible to internal browning. This condition prevents sea-freight transportation of local pineapple to the distant markets of the world forcing the exporters to air-freight pineapple which results in increased transport cost and reduction in export volume.

The characteristic symptom is the development of translucent areas on the tissue adjacent to the core areas which subsequently spread into the core. The affected areas enlarge and turn brown as severity of the condition increases. Typical internal browning symptoms are often exhibited by the cultivar 'Mauritius' and in the cultivar 'Kew' the symptoms are confined only to isolated patches of tissues adjacent to the core region. Pineapple cultivar 'Mauritius' show internal browning symptoms within 10 days of cold storage at 10 °C whereas in the cultivar 'Kew' the symptoms appear 14 days after cold storage.

Storage of fruits of cultivar 'Mauritius' packed in polythene bags under vacuum low temperature delayed the symptom appearance compared to the fruits stored without polythene bags. But such a difference was not observed in the cultivar 'Kew'.

The internal browning results from a combination of both cellular damage and brown pigmentation due to the phenolic metabolism. The enzymes, phenyl alanin ammonia-lyase (PAL), polyphenol oxidase (PPO), and peroxidases (POD) are known to be involved in the synthesis of phenols and hence in the development of internal browning disorder. Activity of these enzymes was assayed using acetone powder prepared from tissues removed from areas around the core region of pineapples 7,10,14,18, and 21 days after cold storage. It was found that the two enzymes, PPO and POD, were associated with the development of internal browning in both varieties, however the activities of these enzymes were higher in cultivar 'Mauritius' than in 'Kew.' PAL activity of fruits belonging to both cultivars was similar when they were Both 'Mauritius' and 'Kew' fruits cold stored under normal and modified atmosphere, showed similar phenylalanin ammonia lyase activity (PAL) at all stages.

The fruits stored at modified atmospheric conditions (polythene bags under vacuum) showed contrast in POD and PPO enzyme activities. The varieties 'Mauritius' and 'Kew' stored under MA conditions showed higher values of enzyme activities compared to the fruits stored under normal atmospheric conditions. But PAL activity was similar in two varieties in both conditions. The % titratable acidity was higher in variety 'Mauritius', than the variety 'Kew' during the days of cold storage.