

Hexanal incorporated fibre-polymer composite board and its efficacy on shelf life of mango

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Introduction

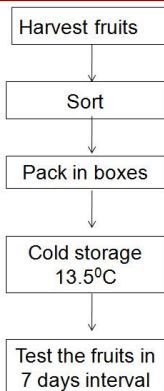
Post harvest loss of fruit and vegetable in Sri Lanka could be close to 40%. Loss is due to poor management of produce after harvest resulting in physical injury, moisture loss and disease. Further to research conducted at the the University of Guelph, Canada it is known that hexanal is a Phospholipase D inhibitor, which prevents fruit membrane degradation. In this study hexanal was incorporated into a fiber polymer composite material, for use in fruit packs for reducing post harvest loss by slow release of hexanal vapour into the fruit pack during storage and transportation. .

Methodology

The fiber polymer composite board developed consisted of Banana fiber (9.73%), Polymeric materials (2.54%) and Bio polymers (17.34%). Hexanal was incorporated into the matrix by mixing 12.69% of final weight. The mixture was filled into a polythene case wrapped with aluminum foil and subjected to a hot press for 1 minute at 130°C. The aluminum foil pack was opened for use and pasted on the inside lid of the fruit box. Six randomly selected TJC mangoes were used in trials for efficacy testing. Boxes were placed in a cold room held at 13.5°C, and tested at 7 days intervals over a period of 28th days.

Results

Testing Protocol – TJC mango



Composite material



Parameters tested:

- Fruit firmness (kg)
- Flesh firmness (kg)
- °Brix
- Acidity (% Citric acid)
- pH
- % Physiological weight loss
- Colour of fruit & flesh



SOCIO-ECONOMIC IMPACT

HEXANAL INCORPORATED COMPOSITE MATERIAL HELPS EXTEND STORAGE LIFE OF MANGOES AND REDUCES LOSS. THIS ENABLES EXPORT OF LARGER VOLUMES OF FRUIT PURCHASED FROM FARMERS AND TRANSPORTED AT LOWER BY SEA FREIGHT.

PRODUCT DEVELOPED BASED ON...

- UTILIZATION OF BANANA PSEUDO STEM
 - NONTOXIC INGREDIENTS
- HEXANAL AS ACTIVE INGREDIENT (REACTIVE & PHOTOOXIDATION)
- HEXANAL RELEASE PATTERN (EVAPORATION/ OXIDATION)
- STABILIZATION OF HEXANAL IN MATRIX

Parameter	Storage period (Days)	Control	Composite	Statistical Difference
Fruit firmness (kg)	7	5.93 ± 0.29	10.28 ± 0.74	Significant
	14	2.79 ± 0.19	4.32 ± 0.39	Significant
Flesh firmness (kg)	7	1.00 ± 0.11	2.60 ± 0.39	Significant
	14	0.53 ± 0.06	0.95 ± 0.09	Significant
°Brix	7	13.0 ± 0.0	12.3 ± 0.7	Not significant
	14	15.67 ± 0.33	15.33 ± 0.33	Not significant
pH	7	3.59 ± 0.03	3.47 ± 0.02	Not significant
	14	4.37 ± 0.05	3.65 ± 0.03	Significant
Acidity (% Citric acid)	7	1.09 ± 0.05	1.15 ± 0.04	Not significant
	14	0.65 ± 0.07	0.81 ± 0.08	Not significant

Note: Control fruits were not in marketable condition at 21st day and thereafter

Conclusion: Mango fruits subjected to storage with hexanal incorporated composite for 21 days at 13.5°C showed good marketability traits with significantly higher fruit firmness & flesh firmness.

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