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RESEARCH PAPER

Influence of packing materials and storage conditions on juice percentage and shelf-life of passion fruit (*Passiflora edulis*)

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SUMMARY : The experiment was designed to investigate the influence of packing materials and storage conditions on juice percentage and shelf-life of passion fruits. Packaging material such as perforated and non-perforated polythene bags, cling film, fresh banana leaves and fresh *Phrynum* spp. leaves with two different storage conditions *viz.*, ambient storage condition and zero energy cool chamber storage were taken. Results showed that, packing of passion fruits in non-perforated polythene bags and storing it under zero energy cool chamber storage condition retained juice percentage and extended shelf-life of the fruits**.**

KEY **W**ORDS : Passionfruit, Shelf-life, Juice percentage, ZECC, Perforated and non-perforated

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Passion fruit is a very commonly grown fruit in Nagaland. It belongs to the family Passifloraceae.Passion fruits are good source of pro-vitamin-A,ascorbic acid, riboflavin,niacin and have a high mineral content. Passion fruits stands out not only because of its exotic flavour but also because of its vitamin content. In Nagaland, it covers an area of 1,690 ha with an annual production of approximately 565 MT (Kikon,2004) But passion fruits are liable to rapid deterioration immediately after harvest and loose consumers appeal within a short span of storage period. This necessitates to develop special post-harvest treatments which can retain the quality of harvested fruits and extend their postharvest shelf-life.The major objectives of the study was: to study the effect of packing materials on the juice percentage and shelf-life of the frut during storage,to study the effect of storage conditions on the juice percentage and shelf-life of fruit during storage and to study the interaction effect between packing materials and storage conditions on the juice percentage and shelf-life of fruit during storage.

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EXPERIMENTAL METHODS

The present investigation was carried out in the Nagaland University, Medziphema Campus.The fruit samples were collected from a private farm at Peren district of Nagaland. Each treatment was replicated 3(three) times with 50 fruits as a unit. Five fruits per treatment were used for taking various observations on every date of observation. Treatments consisted of two factors-packing materials and storage conditions. Packing materials (under first factor) consisted of M_1-Control (no packing) M_2-Perforated polythene packing, M_3-Non-Perforated polythene packing, M_4 - Cling film packing, M_5-Fresh banana leaf packing, M_6- Fresh *Phrynum* spp. leaf packing . On the other hand, storage condition consisted of two different type of storage, such as S_1- Ambient condition and S_2- Zero energy cool chamber. The experiment was designed in Completely Randomized Design (CRD) and consisted of three replications and intervals of the observation fixed at 3(three days) The major items of the observation were juice percentage and shelf-life. The juice of the fruit was squeezed out manually from the pulp after removing the rind, with the help of muslin cloth and the volume of juice was

measured in graduated measuring cylinder and percentage of juice out of the total fruit weight was calculated. Shelf-life of the fruit was calculated by counting the days from the date of fruit storage to the date on which the fruit showed shrinked appearance, become soft and unmarketable.

EXPERIMENTAL FINDINGS AND ANALYSIS

Results of the present studies revealed that there was significant difference between different treatments imposed are presented bellow :

Juice content *:*

The juice content of the fruit as influenced by packing materials and storage conditions are shown in the Table 1. It was evident from the data that packing materials did not have significant influence on the juice content of fruit during the storage period.However, there was a decreasing trend on the juice content of fruit with the increase in storage period.It was also noted that the decrease in juice content was faster in control(M_1) whereas it was slower in non-perforated polythene packing (M_3).Further analysis of the data revealed that storage conditions also failed to significantly affect the juice content of fruit on all dates of observation.However,there was a decreasing trend in the juice content with the increase in storage period and indecrease in juice content was faster under ambient condition(S_1) than ZECC storage condition(S_2).Interaction between packing materials and storage conditions on the juice content was significant on all dates of observation.

Shelf-life :

Influence of various packing materials and storage conditions on shelf-life of fruit is shown in Table 2. It was observed that all types of packing materials increased the shelf-life of fruit as compared to control (M_1) which had the shortest shelf-life (5.5 days) while non-perforated polythene packing (M_3) had the highest shelf-life (23.5 days).

Between the storage conditions,fruits from ZECC storage

Table 1: Variation in juice content (%) of passion fruit in response to packaging materials and storage conditions

Treatments	Days after storage				
	4	7	10	13	16
Packing materials(M)					
Control (M_1)	26.27	26.28	26.07	25.36	23.92
Perforated polythene packing(M_2)	26.91	26.2	25.63	25.48	24.99
Non-perforated polythene packing(M_3)	26.58	25.81	25.87	25.55	25.11
Cling film packing(M_4)	27.02	25.85	25.63	25.24	24.77
Fresh banana leaf packing(M_5)	26.73	24.97	25.23	25.15	24.75
Fresh *Phrynum* spp. leaf packing (M_6)	28.3	26.09	25.86	25.33	24.34
C.D. at 5%	NS	NS	NS	NS	NS
Storage conditions (S)					
Ambient condition (S_1)	26.74	25.34	25.45	25.1	24.42
Zero energy cool chamber(S_2)	27.19	26.4	25.94	25.6	24.86
C.D. at 5%	NS	NS	NS	NS	NS
Interaction					
C.D. at 5%(MXS)	NS	NS	NS	NS	NS

Table 2 : Influence of packing material and storage conditions on shelf-life (days) of passion fruit

Treatments packing materials (M)	Storage conditions (S)		Mean (M)
	Ambient (S_1)	Zero energy cool chamber	
Control (M_1)	4	7	5.5
Perforated polythene packing (M_2)	16	16	16
Non-perforated polythene packing (M_3)	22	25	23.5
Cling film packing (M_4)	13	19	16
Fresh banana leaf packing (M_5)	13	13	13
Phrynum spp. leaf packing (M_6)	16	16	
Mean (S)	14	16	

condition (S_2) had slightly better shelf-life (16 days) than the ambient condition (S_1)which had shorter shelf-life (14 days).

The juice content of the fruit was found to decrease with the progress of storage period in all the packing treatments, this was similar with the findings recorded in other fruits like kagazi lime (Bhullar,1983) and mosambi sweet orange(Ladaniya and Singh,2001).The decrease in juice content was slower in non-perforated polythene packing while the decrease was faster in no packing fruits. A similar result was recorded by Ganapathy and Singh (1976) in passion fruit. Besides that, fruits from ZECC had slightly better shelf-life than ambient condition.Similar results were also obtained by Collazos *et al.*(1984) in passion fruit and banana, Mohammed (1993) in passion fruit and Kamble and Chavan (2005) also recorded more shelf-life of custard apple fruits under cold storage than under ambient condition.

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