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Standardization of method for preservation of guava (*Psidium guajava* L.) pulp Cv. Sardar and G-Vilas

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Abstract
An experiment was conducted to standardize preservation method for guava pulp. Pulp was extracted by different methods, B_1 (from fully ripe fruit of cv. Sardar without blanching by screw type pulp extractor), B_2 (fully ripe fruit cv. Sardar with blanching by screw type pulp extractor), B_3 (fully ripe fruit cv. G-Vilas without blanching by screw type pulp extractor) and B_4 (fully ripe fruit cv. G-Vilas with blanching by screw type pulp extractor). Pulp obtained was packed in two different packaging materials *viz*., retortable pouch (P_1) and 400 gauge polyethylene pouch (P_2) and then stored at ambient condition (S_1) and cold storage (5+1 °C) (S_2). Observations for changes in quality parameters were recorded at one month interval up to the 6 months. Pulp extracted from $B_1P_1S_2$ recorded higher values for important quality and sensory parameters and can be stored up to 6 and 3 months, respectively in cold storage and ambient conditions.

Keywords: Guava pulp, Sardar, G-Vilas, storage, polyethylene pouch, retortable pouch

Introduction

Guava (*Psidium guajava* L.) has been called as "Apple of Tropics" and "Poor man's apple". It also contains 74-84% moisture, 13-26% dry matter, 0.8-1.5% protein, 0.4-0.7% fat and 0.5-1.0% ash and the fruit is considered as an excellent source of vitamin C (299 mg/100 g) and pectin (1.15%) (Wilson, 1980) [1]. The fruit has an appreciable amount of minerals such as phosphorus, calcium, iron as well as vitamins like niacin, thiamine, riboflavin and vitamin A. Owing to high nutraceutical values of guava, hardiness and wider adaptability there has been a growing consumer preference, resulting in expansion of area across the country. Sardar is one of the most popular and commercial variety of guava for dessert and processing purpose and Cv. G-Vilas also getting the popularity among the farmers of Maharashtra. As the farmers are adopting high density planting and meadow orchard system, it turns in increased productivity. But, guava fruit cannot be stored for more than a week in winter and 2-3 days in rainy season because of high moisture content.

The prevention of losses of the seasonal surplus of the fruit by processing and preservation techniques at farmers' level and as well as industrial scale should be warranted. Guava fruit can be processed and preserved in the form of pulp. Processed guava pulp is an excellent raw material for preparation of various products like juice, blended RTS beverages, guava wine, guava powder, jam, toffee, cheese, ice cream topping and nectar. These products have good potential for internal as well as external trade. It is the immense need to develop efficient method for pulp extraction to obtain high value trait pulp. Further necessity is to preserve quality pulp for longer time. If some suitable methods are developed for preserving pulp will create scope to run the processing unit during off season also. As a result the producer and the consumer will be benefited. In this context present study was planned to find out the most suitable for preservation of guava pulp.

Material and Methods

The present investigation on "To standardize the method for preservation of guava pulp" was conducted during October 2017 to May 2019 at laboratory of Postharvest Technology, Department of Horticulture, Mahatma Phule Krishi Vidyapeeth Rahuri, Dist. Ahmednagar, Maharashtra. Guava fruit of cv. Sardar were procured from Horticultural Farm and Central Nursery, Department of Horticulture, MPKV, Rahuri, and fruit of cv. G-Vilas were collected from the field of a progressive farmer Rahata Tahsil, Dist. Ahmednagar, Maharashtra.

The winter season mature guava fruit were harvested in the morning and brought to laboratory. Healthy, sound guava fruit free from any disease were selected and kept for ripening. Pulp was extracted from fully ripe fruit Cv. Sardar and G-Vilas. The fruit were subjected to pretreatment of no blanching (T_1) and blanching (T_2). Fruit were blanched for 3 minutes at boiling temperature. Fruit were cut into quarters after tip cutting and then passed through screw type pulp extractor to obtain smooth pulp. Pulp obtained was passed through 1mm stainless steel sieve to separate the seeds and get fine texture. Pulp thus obtained was pasteurized at 85ºC for 5 minutes. Potassium metabisulphite preservative was added @ 0.1% to the pulp and then hot filled in pre sterilized retortable pouches (unprinted Alu Retortable Standup Pouch, Spec: 12µ PET/09µ Alu/15µ BON/70µ CPP). Sealed retortable pouches were pasteurized in hot water. After pasteurization process the pouches were allowed to cool and then transfer to storage. For 400 gauge polyethylene bags, pulp was allowed to cool first and then filled followed by sealing. 150 g of pulp was filled in each pouch. Packed pulp then stored at two different storage conditions *viz*. ambient temperature and cold storage (8$\pm$1 °C) for six months.

Pulp was evaluated for quality parameters, sensory and microbial count at every month during storage. Total soluble solids (T.S.S.) were determined with the help of Hand refractometer (Erma Japan, 0 to 32^0 Brix) and value was corrected at 20 °C with the help of temperature correction chart. The titratable acidity (%), reducing sugars (%), total sugars (%), ascorbic acid (mg/100 g) and pectin (%) were estimated as per the methods suggested by Ranganna (1977) [2] and Ranganna 1986) [3]. For evaluation of various organoleptic quality attributes, the method discussed by Amerine *et al*. (1965) [4] was adopted using a nine-point hedonic scale basis. The microbiological load in guava pulp was observed as total plate count (TPC) and yeast and mould count (YMC) by using method suggested by Luna-Guzman and Barrett (2000) [5] and Silveira *et al*. (2011) [6]. The design adopted was completely randomized design with factorial concept and the data were subjected to statistical analysis as per the procedure advocated by Panse and Sukhatme (1985) [7].

Result and Discussion

1. Effect of different preservation methods on physicochemical composition of guava pulp during storage

1.1 Total Soluble Solids (ºB)

Table 1 represents data regarding changes in TSS of guava pulp during storage. Individual effect of pulp extraction methods, packaging material and storage conditions showed significant variation in TSS content. TSS increased up to 3rd month and later decreased. At the end of 6th month higher TSS was observed in B_1 (13.03ºB) followed by B_2 (12.36ºB), B_3 (12.09ºB) and B_4 (11.68ºB). Packaging treatment P_1 influenced slower changes in TSS and at the end of storage maintained higher TSS (12.92ºB) as compared to P_2 (11.66ºB). At ambient condition increase and further decrease in TSS was found at faster rate than cold storage. At the end of storage treatment S_2 (13.42ºB) retained higher TSS than S_1 (11.15ºB). Among two factor interactions packaging materials and storage conditions significantly influenced TSS from 3rd month and P_1S_2, revealed slower changes and retained higher TSS (13.70ºB) at the end of storage. Combine effect of all tress factors reveled non-significant variation in TSS content of pulp. At the end of 6th month highest TSS content was reported by interaction $B_1P_1S_2$ (14.56ºB).TSS content of guava pulp found to be increased from 13.10 to 13.96ºB up to 3rd month of storage later decreased to 12.29ºB at the end of 6th month irrespective of any treatment.

The increment in TSS content of preserved guava pulp during storage was probably due to conversion of free polysaccharides (starch) into monosaccharide (Jain and Nema, 2007) [8]. On completion of hydrolysis of starch, the further increase in TSS did not occur. The subsequent decrease in TSS at advanced stage is owing to its faster utilization in oxidation process under ambient temperature and revival microbial spoilage leading to the fermentation (Hussain *et al*., 2003) [9]. Under cold storage low temperature reduces thermal decomposition and microbial spoilage. Retortable pouch showed slower increase and minimum decrease in TSS during storage than that of polyethylene pouch. The lower permeability of retortable pouch to gases might have resulted in slower rate of conversion of sugars.

1.2 Titratable acidity (%)

Titratable acidity of guava pulp influenced by different preservation methods during storage is presented in table 1. It was significantly differ at initial day of storage with respect to pulp extraction methods. Higher acidity was reported by B_1 (0.55%) followed by B_2 (0.50%), B_3 (0.44%) and B_4 (0.40%). Same trend was maintained during entire storage period with significant variation in data. At the end of storage titratable acidity reached to 0.96% in B_1 followed by B_2 (0.90%), B_3 (0.85%) and B_4 (0.80%). In case of packaging material P_1 resulted slower increase in acidity as compared to P_2. During storage acidity increased from 0.47% to 0.84% in P_1 and 0.91% in P_2. With respect to storage conditions, S_2 recorded minimum increase in titratable acidity than S_1. Acidity increased from 0.47% to 0.76% in S_2 and 0.99% in S_1 within 6 months of storage. All two factor interactions effect revealed non-significant variation in titratable acidity during storage.

Three factor interactions effect also resulted non-significant variation in titratble acidity throughout the storage period. At the end of storage minimum and maximum titratable acidity was reported by interactions $B_3P_1S_2$ (0.70%) and $B_1P_2S_1$ (1.12%). Titratable acidity found increased during storage from 0.47 to 0.87% within 6th months of storage irrespective of any treatment. The increment in acidity of preserved guava pulp during storage period was due to formation of organic acids by degradation of ascorbic acids (Bal *et al*., 2014) [10]. Faster rate ascorbic acid oxidation under ambient temperature might have resulted higher acidity. Increased bacterial growth at later stages might have utilized sugars and resulted formation of acids.

1.3 Reducing sugars (%)

Data regarding changes in reducing sugars of guava pulp during storage is presented in table 2. Individual effect of pulp extraction method showed significant variation in reducing sugars of guava pulp from initial day to end of storage. At day of preservation highest reducing sugars were observed in B_1 (5.56%) followed by B_2 (5.23%), B_3 (5.10%) and B_4 (4.82%). Reducing sugars increased up to 3rd month and later decreased. At the end of 6th month higher reducing sugars were observed in B_1 (5.94%) followed by B_2 (5.57%), B_3 (5.41%) and B_4 (5.11%). Among the two packaging treatments P_1 influenced slower increase and further decrease in reducing sugars and at the end of storage maintained higher reducing sugars (5.76%) as compared to P_2 (5.26%). Reducing sugars was varied significantly with different storage conditions. It was noted that, under ambient condition increase and further decrease in reducing sugars was found at faster rate than cold storage. Reducing sugars increased from 5.18% to 8.04% and 7.52% respectively at ambient condition (3^{rd} month) and cold storage (5^{th} month) and later declined. At the end of storage period (6^{th} month) treatment S_2 (6.66%) retained higher reducing sugars than S_1 (4.35%). Two factors interactions effect revealed non-significant difference in reducing sugars of pulp during storage. Though the three factor interaction effect resulted non-significant variation in data, highest reducing sugars were observed in $B_1P_1S_2$ (7.60%) at the end of 6^{th} month.

Reducing sugars of guava pulp found to be increased from 5.18 to 7.40% up to 3^{rd} month of storage and later reduced to 5.51% at the end of 6^{th} month irrespective of any treatment. An increase in reducing sugar content was also reported by Bhuvaneswari and Tiwari (2007) [11] and Tandon *et al.* (1983) [12] in guava pulp at room temperature up to 60 days further they explained that it might be due to breakdown of some of the hemi-celluloses and other saccharides into simple soluble sugars. According to Bons and Dhawan (2013) [13], inversion of non-reducing sugars to reducing sugars might have caused increase in reducing sugars. Later decrease in reducing sugars with higher rate under ambient condition and more retention in retortable pouch may be due to reasons as explained under TSS.

1.4 Total Sugars (%)

Table 2 represents data regarding changes in total sugars of guava pulp during storage. Individual effect of pulp extraction methods showed significant variation in total sugars content of guava pulp from initial day to end of storage. At initial day highest total sugars were found in B_1 (8.52%) followed by B_2 (8.09%), B_3 (7.50%) and B_4 (7.11%). Total sugars were increased up to 3^{rd} month of storage and later declined. At the end of 6^{th} month higher total sugars were observed in B_1 (8.55%) followed by B_2 (8.09%), B_3 (7.47%) and B_4 (7.05%). Packaging materials individually influenced the total sugars content of pulp and resulted significant variation in data. Treatment P_1 (7.81 to 9.64%) influenced slower increase in total sugars than P_2 (7.81 to 9.89%) up to 3^{rd} month and declined later. At the end of storage P_1 (8.39%) maintained higher total sugars as compare to P_2 (7.18%). It is because treatment P_1 exhibited slower decrease in total sugars. Total sugars were varied significantly with different storage conditions. At ambient condition increase and further decrease in total sugars was found at faster rate. At the end of storage period (6^{th} month) S_2 (8.97%) retained higher total sugars than S_1 (6.60%).

Two factors interactions effect of pulp extraction methods and packaging materials and pulp extraction methods and storage conditions revealed non-significant difference Interaction between packaging materials and storage conditions significantly influenced total sugars content on 3^{rd}, 4^{th} and 6^{th} month of storage. At the end of storage highest total sugars was retained in interaction P_1S_2 (9.50%), as the interaction effect reveled slower changes in total sugars. Three factor interaction effect influenced non-significant variation in data and at the end of 6^{th} month highest total sugars were observed in $B_1P_1S_2$ (10.33%).

Total sugars of guava pulp found to be increased from 7.81 to 9.76% up to 3^{rd} month of storage later decreased to 7.79% at the end of 6^{th} month irrespective of any treatment. Bal *et al.* 2014 explained that total sugar was increased during storage period is due to solubilization of pulp constituents and hydrolysis of polysaccharides including pectin and starch materials. Similar types of observation for total sugar have been reported by Choudhary *et al.* (2004) [14] in guava nectar. Later decrease in total sugars with higher rate under ambient condition and more retention in retortable pouch may be due to reasons as explained under TSS.

1.5 Ascorbic acid (mg/100 g)

Ascorbic acid of guava pulp as influenced by different preservation treatments during storage is presented in table 3. Ascorbic acid was significantly differ at initial day of storage with respect to pulp extraction methods. Higher ascorbic acid was reported by B_1 (201.20 mg/100 g) followed by B_2 (172.16 mg/100 g), B_3 (114 mg/100 g) and B_4 (85.50 mg/100 g). Same trend was maintained throughout the storage period with significant variation in data. At the end of storage ascorbic acid reached to 88.71 mg/100 g in B_1 followed by B_2 (82.61 mg/100 g), B_3 (23.56 mg/100 g) and B_4 (18.04 mg/100 g). Packaging material individually influenced ascorbic acids of pulp and showed significant variation in data from 1^{st} to 6^{th} month of storage. During storage ascorbic acid decreased from 143.22 to 60.09 mg/100 g in P_1 and 46.37 mg/100 g in P_2. Results indicated that, packaging material P1 could minimize the loss of ascorbic acid during storage. Between two the storage conditions, cold storage (143.22 to 77.76 mg/100 g) revealed minimum reduction in ascorbic acid than ambient condition (143.22 to 28.70 mg/100 g).

Two factors interactions effect of pulp extraction methods and packaging materials significantly influenced ascorbic acid content during storage at 5^{th} and 6^{th} month. Interaction B_2P_1 (94.29 mg/100 g) exhibited minimum loss and could retained significantly maximum ascorbic acid at the end of storage period. Ascorbic acid content varied significantly with interaction of pulp extraction methods and storage conditions at 3 to 6^{th} month of storage. At the end of storage interaction B_1S_2 (120.81 mg/100 g) retained higher ascorbic acid. Ascorbic acid content showed significant variation at the end of storage with interaction of packaging materials and storage conditions and resulted higher ascorbic acid in B_1S_1 (85.82 mg/100 g). Three factors interaction effect resulted non-significant variation in ascorbic acid content except at the end of storage i.e. 6^{th} month with higher ascorbic acid in $B_1P_1S_2$ (129.58 mg/100 g).

Ascorbic acid found to be decreased during storage from 143.22 to 53.23 mg/100 g irrespective of any treatment. The decrease in ascorbic acid content of guava pulp during storage also reported by Bons and Dhawan (2013) [13] in guava pulp, Singh *et al. (*2017) [15] in mango pulp and Bal *et al.* (2014) [10] in guava nectar. Ascorbic acid is more sensitive to oxidation and destroys very quickly in presence of oxygen, hence, it might have been destroyed during processing and subsequently during storage, Hayati (1987) [16]. Faster decreasing rate under ambient condition may be due increased oxidation with high temperature. Higher retention was observed in pulp packed in retortable pouch as compared to polyethylene. This may be due to lower permeability of retortable pouch which might have lowered oxidation of ascorbic acid leading to minimum losses.

1.6 Pectin (%)

The effect of different treatments on pectin content of preserved guava pulp during different periods of storage showed in table 3. Individual effect of pulp extraction methods revealed significant variation in pectin content at initial day of storage. Highest pectin at initial day was found in B_2 (1.57%) followed by B_4 (1.43%), B_1 (1.38%) and B_3 (1.26%). Pectin content decreased steadily with storage period and end of storage same trend was maintained, B_2 (0.57%) followed by B_4 (0.53%), B_1 (0.48%) and B_3 (0.42%). Packaging material individually revealed significant difference in pectin from 1st to 6th month of storage. Pectin content of pulp was decreased from 1.41 to 0.56% in P_1 and 0.44% in P_2 which indicated that, treatment P_1 abled to maintain higher pectin during storage. Storage conditions also significantly influenced the pectin content of pulp. Ambient conditions exhibited faster decrease in pectin from 1.41 to 0.28% during storage as compare to cold storage (1.41 to 0.72%). All two factor interactions effect influenced non-significant variation in pectin content of guava pulp throughout the storage period. Three factors interaction effect was also found non-significant throughout the storage and interaction $B_2P_1S_2$ (0.88%) retained higher pectin content at the end of storage.

It was noted that, pectin content of guava pulp decreased during entire storage from 1.41 to 0.50% irrespective of any treatment. Supriya (1999) [17] in apple pulp Damiani *et al*. (2013) [18] in frozen marolo) reported that pectin content decreased during storage and losses increased with increase in temperature as reported by Sandhu *et al*. (1985) [19] in Kinnow and pineapple concentrates. Decline in pectin content could be attributed to its hydrolysis or conversion of water soluble pectin to oxalate soluble pectin during storage (Saini and Grewal, 1995) [20].

2. Effect of different preservation methods on overall acceptability of guava pulp during storage

Table 4 revealed the effect of different preservation methods on overall acceptability of guava pulp during storage. All interaction under cold storage indicated acceptable sensory score up to the end of 6th month except interaction $B_4P_2S_2$ (up to 5th month). At the end of storage, highest overall acceptability score was reported by interaction $B_1P_1S_2$ (6.74) followed by $B_1P_2S_2$ (6.50), $B_2P_1S_2$ (6.04), $B_2P_2S_2$ (5.86), $B_3P_1S_2$ (5.75), $B_3P_2S_2$ (5.62) and $B_4P_1S_2$ (5.51).

Among all interaction with ambient storage, interaction $B_1P_1S_1$ (6.51), $B_1P_2S_1$ (5.86), $B_2P_1S_1$ (6.12), $B_2P_2S_1$ (5.66) and $B_3P_1S_1$ (5.76) recorded acceptable sensory score up to end of 3rd month. Whereas, interactions $B_3P_2S_1$ (6.30), $B_4P_1S_1$ (6.41) and $B_4P_2S_1$ (6.00) indicated sensory acceptability up to end of 2nd month of storage.

Mean overall acceptability of pulp decreased during entire storage period from 8.40 to 3.45. Suman Kumari *et al.* (2017)[21] in guava pulp and Choudhary (2004) [14] in guava nectar observed that overall acceptability was decreased with the advancement of storage duration owing to oxidative reaction to deteriorate the scores of colour, flavour as well as taste (Bal *et al*., 2014) [10]. Pulp under cold storage and packed in retortable pouch revealed higher retention of sensory quality. It might be due to lower temperature in cold storage and lower permeability of retortable pouch restricts oxidative deterioration.

3. Effect of different preservation methods on microbial count of guava pulp during storage

3.1 Total Plate Count (cfu/g)

The effect of different preservation methods on total plate count of guava pulp during storage is depicted in table 5. In all interactions under ambient condition irrespective of pulp extraction method and packaging material TPC was non-detectable at initial day of storage. It was increased later from 1st month and up to the end of 3rd month it was within the acceptable limit. From 4th month all interaction except $B_2P_1S_1$ crossed the acceptable limit of TPC. TPC in $B_2P_1S_1$ was 8.67cfu/g which was increased further and reached to unacceptable limit at the end of 5th month. TPC in all interactions with cold storage irrespective of pulp extraction method and packaging material was non-detectable up to 1 month of storage. 2nd month onwards it was increased but was within the acceptable limit up to the end of storage period. At the end of 6th month minimum TPC was observed in $B_2P_1S_2$ (4cfu/g).

3.2 Yeast and mould count (cfu/g)

The effect of different preservation methods on yeast and mould in guava pulp during storage is depicted in table 35. All interactions under ambient condition irrespective of pulp extraction method and packaging material indicated non-detectable YMC at initial day of storage. Yeast and mould count was increased later from 1st month and up to the end of 3rd month it was within the acceptable limit. From 4th month all interaction crossed the acceptable limit of yeast and mould count. Interaction $B_2P_1S_1$ indicated minimum YMC count at the end of 3rd month (4.67cfu/g).

Yeast and mould count in all interactions under cold storage irrespective of pulp extraction method and packaging material was non-detectable up to 1 month of storage. From 2nd month it was increased but was within the acceptable limit up to the end of storage period. At the end of 6th month minimum yeast and mould count was observed in $B_2P_1S_2$ (5cfu/g).

Total bacterial and fungal growth in preserved guava pulp was found to be increase with the advancement of storage period. The results of present finding are in agreement with results obtained by Suman Kumari *et al.* (2017) [21] in guava pulp, Hussain *et al*. (2003) [9] in mango pulp, Bhuwad (2016) [22] in cashew apple juice. Cold storage significantly reduced the microbial count as the low temperature prevailing restricted their growth.

Table 1: Effect of different methods of preservation on TSS (°B) and Titratable acidity (%) of guava pulp

Treatments	TSS (°B)							Titratable acidity (%)						
	Initial	1 Month	2 Month	3 Month	4 Month	5 Month	6 Month	Initial	1 Month	2 Month	3 Month	4 Month	5 Month	6 Month
B_1	13.85	14.23	14.68	14.78	14.59	14.15	13.03	0.55	0.61	0.67	0.73	0.80	0.88	0.96
B_2	13.17	13.53	13.95	14.05	13.86	13.43	12.36	0.50	0.55	0.61	0.67	0.74	0.82	0.90
B_3	12.90	13.24	13.64	13.73	13.54	13.12	12.09	0.44	0.50	0.56	0.62	0.69	0.77	0.85
B_4	12.48	12.80	13.18	13.26	13.07	12.66	11.68	0.40	0.45	0.51	0.57	0.64	0.72	0.80
SEm(±)	0.10	0.08	0.08	0.08	0.09	0.09	0.09	0.00	0.01	0.01	0.01	0.01	0.01	0.01

CD @ 1%	0.40	0.31	0.31	0.32	0.34	0.36	0.36	0.01	0.02	0.03	0.04	0.03	0.04	0.05
P_1	13.10	13.37	13.69	14.06	13.90	13.74	12.92	0.47	0.52	0.57	0.63	0.69	0.76	0.84
P_2	13.10	13.53	14.04	13.85	13.63	12.94	11.66	0.47	0.53	0.60	0.67	0.74	0.82	0.91
SEm(±)	0.07	0.06	0.06	0.06	0.06	0.07	0.07	0.00	0.00	0.01	0.01	0.01	0.01	0.01
CD @ 1%	NS	NS	0.22	0.23	0.24	0.25	0.25	NS	0.01	0.02	0.03	0.02	0.03	0.03
S_1	13.10	13.58	14.15	14.05	13.33	12.56	11.15	0.47	0.55	0.63	0.71	0.79	0.89	0.99
S_2	13.10	13.32	13.58	13.87	14.20	14.12	13.42	0.47	0.51	0.55	0.59	0.64	0.70	0.76
SEm(±)	0.07	0.06	0.06	0.06	0.06	0.07	0.07	0.00	0.00	0.01	0.01	0.01	0.01	0.01
CD @ 1%	NS	0.22	0.22	0.23	0.24	0.25	0.25	NS	0.01	0.02	0.03	0.02	0.03	0.03
B_1P_1	13.85	14.16	14.51	14.91	14.75	14.58	13.68	0.55	0.60	0.65	0.71	0.77	0.85	0.92
B_1P_2	13.85	14.31	14.85	14.66	14.44	13.72	12.37	0.55	0.62	0.68	0.76	0.83	0.91	1.00
B_2P_1	13.17	13.45	13.78	14.16	14.00	13.84	12.99	0.50	0.55	0.60	0.65	0.71	0.79	0.87
B_2P_2	13.17	13.60	14.12	13.94	13.71	13.02	11.73	0.50	0.56	0.62	0.69	0.76	0.85	0.93
B_3P_1	12.90	13.16	13.47	13.83	13.68	13.51	12.71	0.44	0.49	0.54	0.60	0.66	0.74	0.81
B_3P_2	12.90	13.32	13.82	13.63	13.41	12.73	11.46	0.44	0.51	0.58	0.65	0.72	0.80	0.89
B_4P_1	12.48	12.72	13.01	13.35	13.20	13.03	12.28	0.40	0.45	0.50	0.55	0.61	0.69	0.77
B_4P_2	12.48	12.88	13.36	13.17	12.95	12.29	11.08	0.40	0.46	0.53	0.59	0.67	0.75	0.83
SEm(±)	0.14	0.11	0.11	0.12	0.12	0.13	0.13	0.00	0.01	0.01	0.01	0.01	0.01	0.02
CD @ 1%	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
B_1S_1	13.85	14.36	14.97	14.86	14.11	13.31	11.80	0.55	0.63	0.71	0.80	0.88	0.98	1.08
B_1S_2	13.85	14.11	14.39	14.71	15.07	15.00	14.25	0.55	0.59	0.62	0.67	0.72	0.78	0.84
B_2S_1	13.17	13.65	14.24	14.13	13.41	12.63	11.20	0.50	0.57	0.65	0.73	0.81	0.91	1.00
B_2S_2	13.17	13.40	13.66	13.96	14.30	14.23	13.52	0.50	0.54	0.57	0.62	0.67	0.73	0.79
B_3S_1	12.90	13.37	13.93	13.83	13.13	12.36	10.97	0.44	0.52	0.60	0.69	0.77	0.87	0.97
B_3S_2	12.90	13.11	13.36	13.64	13.96	13.88	13.20	0.44	0.48	0.52	0.56	0.61	0.67	0.73
B_4S_1	12.48	12.93	13.47	13.37	12.69	11.94	10.64	0.40	0.47	0.55	0.63	0.71	0.81	0.90
B_4S_2	12.48	12.67	12.90	13.16	13.46	13.38	12.71	0.40	0.44	0.48	0.52	0.57	0.63	0.69
SEm(±)	0.14	0.11	0.11	0.12	0.12	0.13	0.13	0.00	0.01	0.01	0.01	0.01	0.01	0.02
CD @ 1%	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
P_1S_1	13.10	13.48	13.92	14.43	13.85	13.22	12.13	0.47	0.54	0.61	0.68	0.76	0.85	0.95
P_1S_2	13.10	13.27	13.47	13.70	13.96	14.26	13.70	0.47	0.50	0.53	0.57	0.62	0.67	0.73
P_2S_1	13.10	13.68	14.39	13.67	12.82	11.89	10.18	0.47	0.55	0.64	0.74	0.82	0.92	1.02
P_2S_2	13.10	13.38	13.69	14.04	14.44	13.98	13.14	0.47	0.51	0.56	0.60	0.66	0.72	0.79
SEm(±)	0.10	0.08	0.08	0.08	0.09	0.09	0.09	0.00	0.01	0.01	0.01	0.01	0.01	0.01
CD @ 1%	NS	NS	NS	0.32	0.34	0.36	0.36	NS	NS	NS	NS	NS	NS	NS
$B_1P_1S_1$	13.85	14.26	14.73	15.27	14.66	14.00	12.80	0.55	0.62	0.69	0.77	0.85	0.94	1.03
$B_1P_1S_2$	13.85	14.05	14.28	14.54	14.83	15.16	14.56	0.55	0.58	0.61	0.65	0.70	0.75	0.81
$B_1P_2S_1$	13.85	14.46	15.20	14.44	13.56	12.61	10.80	0.55	0.64	0.73	0.83	0.92	1.01	1.12
$B_1P_2S_2$	13.85	14.16	14.50	14.88	15.31	14.83	13.93	0.55	0.59	0.63	0.68	0.74	0.80	0.87
$B_2P_1S_1$	13.17	13.55	14.00	14.52	13.94	13.30	12.18	0.50	0.56	0.63	0.70	0.78	0.87	0.97
$B_2P_1S_2$	13.17	13.34	13.55	13.79	14.06	14.37	13.80	0.50	0.53	0.56	0.60	0.65	0.70	0.76
$B_2P_2S_1$	13.17	13.75	14.47	13.74	12.88	11.95	10.21	0.50	0.57	0.66	0.75	0.84	0.94	1.03
$B_2P_2S_2$	13.17	13.45	13.77	14.13	14.54	14.08	13.24	0.50	0.54	0.58	0.63	0.69	0.75	0.82
$B_3P_1S_1$	12.90	13.27	13.70	14.20	13.63	13.01	11.94	0.44	0.51	0.58	0.66	0.74	0.83	0.92
$B_3P_1S_2$	12.90	13.06	13.25	13.47	13.72	14.01	13.47	0.44	0.47	0.50	0.54	0.59	0.64	0.70
$B_3P_2S_1$	12.90	13.47	14.17	13.46	12.62	11.70	10.00	0.44	0.53	0.62	0.72	0.81	0.90	1.01
$B_3P_2S_2$	12.90	13.17	13.47	13.81	14.20	13.75	12.92	0.44	0.48	0.53	0.57	0.64	0.69	0.76
$B_4P_1S_1$	12.48	12.83	13.24	13.72	13.17	12.57	11.58	0.40	0.46	0.53	0.60	0.68	0.77	0.87
$B_4P_1S_2$	12.48	12.62	12.79	12.99	13.22	13.49	12.97	0.40	0.43	0.46	0.50	0.55	0.60	0.66
$B_4P_2S_1$	12.48	13.03	13.71	13.02	12.20	11.30	9.70	0.40	0.47	0.56	0.65	0.74	0.84	0.93
$B_4P_2S_2$	12.48	12.73	13.01	13.33	13.70	13.27	12.45	0.40	0.44	0.49	0.53	0.60	0.65	0.72
SEm(±)	0.21	0.16	0.16	0.17	0.18	0.18	0.18	0.00	0.01	0.02	0.02	0.02	0.02	0.02
CD @ 1%	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Mean	13.10	13.45	13.86	13.96	13.77	13.34	12.29	0.47	0.53	0.59	0.65	0.72	0.79	0.87

B_1: Sardar without blanch B_3: G- Vilas without blanch P_1: Retortable pouch S_1: Ambient temperature
B_2: Sardar with blanch B_4: G-Vilas with blanch P_2: Polyethylene Pouch S_2: Cold Storage 5±1ºC)

Table 2: Effect of different methods of preservation on reducing sugars (%) and Total sugars (%) of guava pulp

Treatments	Reducing sugars (%)							Total sugars (%)						
	Initial	1 Month	2 Month	3 Month	4 Month	5 Month	6 Month	Initial	1 Month	2 Month	3 Month	4 Month	5 Month	6 Month
B_1	5.56	6.31	7.13	7.87	7.66	7.33	5.94	8.52	9.19	9.93	10.57	10.41	9.68	8.55
B_2	5.23	5.96	6.76	7.48	7.27	6.94	5.57	8.09	8.75	9.46	10.08	9.92	9.20	8.09
B_3	5.10	5.81	6.59	7.29	7.08	6.76	5.41	7.50	8.14	8.83	9.43	9.27	8.56	7.47
B_4	4.82	5.51	6.27	6.95	6.74	6.43	5.11	7.11	7.73	8.40	8.98	8.82	8.12	7.05
SEm(±)	0.04	0.04	0.05	0.05	0.05	0.04	0.03	0.02	0.06	0.06	0.06	0.06	0.06	0.07
CD @ 1%	0.15	0.17	0.18	0.21	0.18	0.16	0.13	0.07	0.22	0.23	0.24	0.24	0.25	0.26

P_1	5.18	5.81	6.50	7.28	7.16	6.81	5.76	7.81	8.36	8.97	9.64	9.59	9.30	8.39
P_2	5.18	5.98	6.87	7.52	7.21	6.93	5.26	7.81	8.54	9.34	9.89	9.62	8.49	7.18
SEm(±)	0.03	0.03	0.03	0.04	0.03	0.03	0.02	0.01	0.04	0.04	0.04	0.04	0.05	0.05
CD @ 1%	NS	0.12	0.13	0.15	NS	0.11	0.09	NS	0.16	0.17	0.17	NS	0.18	0.18
S_1	5.18	6.14	7.20	8.04	6.94	6.22	4.35	7.81	8.66	9.60	10.32	9.37	8.10	6.60
S_2	5.18	5.65	6.17	6.76	7.43	7.52	6.66	7.81	8.24	8.70	9.21	9.84	9.69	8.97
SEm(±)	0.03	0.03	0.03	0.04	0.03	0.03	0.02	0.01	0.04	0.04	0.04	0.04	0.05	0.05
CD @ 1%	NS	0.12	0.13	0.15	0.13	0.11	0.09	NS	0.16	0.17	0.17	0.17	0.18	0.18
B_1P_1	5.56	6.23	6.94	7.75	7.63	7.28	6.20	8.52	9.11	9.74	10.44	10.39	10.10	9.17
B_1P_2	5.56	6.39	7.32	8.00	7.69	7.37	5.67	8.52	9.28	10.11	10.70	10.42	9.27	7.93
B_2P_1	5.23	5.87	6.57	7.36	7.24	6.89	5.83	8.09	8.66	9.28	9.95	9.91	9.61	8.70
B_2P_2	5.23	6.04	6.95	7.61	7.30	7.00	5.32	8.09	8.83	9.64	10.21	9.93	8.80	7.48
B_3P_1	5.10	5.72	6.40	7.17	7.05	6.70	5.66	7.50	8.05	8.65	9.30	9.26	8.96	8.07
B_3P_2	5.10	5.89	6.77	7.41	7.10	6.83	5.17	7.50	8.22	9.01	9.56	9.28	8.17	6.87
B_4P_1	4.82	5.42	6.08	6.83	6.71	6.36	5.34	7.11	7.64	8.22	8.85	8.81	8.51	7.64
B_4P_2	4.82	5.59	6.46	7.08	6.77	6.51	4.87	7.11	7.81	8.58	9.11	8.83	7.74	6.46
SEm(±)	0.06	0.06	0.07	0.08	0.07	0.06	0.05	0.03	0.08	0.09	0.09	0.09	0.09	0.10
CD @ 1%	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
B_1S_1	5.56	6.56	7.65	8.51	7.39	6.63	4.74	8.52	9.41	10.38	11.12	10.14	8.84	7.32
B_1S_2	5.56	6.06	6.61	7.24	7.93	8.02	7.14	8.52	8.98	9.48	10.02	10.67	10.53	9.78
B_2S_1	5.23	6.21	7.28	8.12	7.02	6.28	4.41	8.09	8.96	9.91	10.63	9.68	8.39	6.89
B_2S_2	5.23	5.71	6.24	6.84	7.52	7.61	6.74	8.09	8.53	9.01	9.53	10.16	10.02	9.29
B_3S_1	5.10	6.06	7.11	7.93	6.85	6.13	4.28	7.50	8.35	9.28	9.98	9.05	7.78	6.30
B_3S_2	5.10	5.56	6.07	6.65	7.31	7.40	6.55	7.50	7.92	8.38	8.88	9.49	9.35	8.64
B_4S_1	4.82	5.76	6.79	7.59	6.53	5.83	4.00	7.11	7.94	8.85	9.53	8.62	7.37	5.91
B_4S_2	4.82	5.26	5.75	6.31	6.95	7.04	6.22	7.11	7.51	7.95	8.43	9.02	8.88	8.19
SEm(±)	0.06	0.06	0.07	0.08	0.07	0.06	0.05	0.03	0.08	0.09	0.09	0.09	0.09	0.10
CD @ 1%	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
P_1S_1	5.18	6.04	6.96	8.01	7.20	5.85	4.42	7.81	8.55	9.36	10.26	9.67	8.54	7.29
P_1S_2	5.18	5.59	6.04	6.55	7.12	7.77	7.10	7.81	8.18	8.58	9.02	9.51	10.06	9.50
P_2S_1	5.18	6.25	7.45	8.07	6.69	6.59	4.29	7.81	8.78	9.85	10.38	9.07	7.66	5.92
P_2S_2	5.18	5.71	6.30	6.98	7.74	7.27	6.23	7.81	8.30	8.83	9.41	10.17	9.33	8.45
SEm(±)	0.04	0.04	0.05	0.05	0.05	0.04	0.03	0.02	0.06	0.06	0.06	0.06	0.06	0.07
CD @ 1%	NS	NS	0.18	0.21	0.18	0.16	0.13	NS	NS	NS	0.24	0.24	NS	0.26
$B_1P_1S_1$	5.56	6.45	7.40	8.48	7.64	6.26	4.80	8.52	9.30	10.14	11.06	10.45	9.28	8.00
$B_1P_1S_2$	5.56	6.00	6.48	7.02	7.62	8.30	7.60	8.52	8.92	9.35	9.82	10.34	10.92	10.33
$B_1P_2S_1$	5.56	6.66	7.89	8.54	7.13	7.00	4.67	8.52	9.52	10.62	11.18	9.84	8.40	6.63
$B_1P_2S_2$	5.56	6.12	6.74	7.45	8.24	7.74	6.67	8.52	9.04	9.60	10.21	11.00	10.13	9.22
$B_2P_1S_1$	5.23	6.10	7.03	8.09	7.27	5.91	4.47	8.09	8.85	9.67	10.57	9.98	8.83	7.57
$B_2P_1S_2$	5.23	5.65	6.11	6.63	7.21	7.87	7.19	8.09	8.47	8.88	9.33	9.83	10.39	9.82
$B_2P_2S_1$	5.23	6.31	7.52	8.15	6.76	6.65	4.34	8.09	9.07	10.15	10.69	9.37	7.95	6.20
$B_2P_2S_2$	5.23	5.77	6.37	7.06	7.83	7.35	6.30	8.09	8.59	9.13	9.72	10.49	9.64	8.75
$B_3P_1S_1$	5.10	5.95	6.86	7.90	7.10	5.76	4.34	7.50	8.24	9.04	9.92	9.35	8.22	6.98
$B_3P_1S_2$	5.10	5.50	5.94	6.44	7.00	7.64	6.98	7.50	7.86	8.25	8.68	9.16	9.70	9.15
$B_3P_2S_1$	5.10	6.16	7.35	7.96	6.59	6.50	4.21	7.50	8.46	9.52	10.04	8.74	7.34	5.61
$B_3P_2S_2$	5.10	5.62	6.20	6.87	7.62	7.16	6.13	7.50	7.98	8.50	9.07	9.82	8.99	8.12
$B_4P_1S_1$	4.82	5.65	6.54	7.56	6.78	5.46	4.06	7.11	7.83	8.61	9.47	8.92	7.81	6.59
$B_4P_1S_2$	4.82	5.20	5.62	6.10	6.64	7.26	6.62	7.11	7.45	7.82	8.23	8.69	9.21	8.68
$B_4P_2S_1$	4.82	5.86	7.03	7.62	6.27	6.20	3.93	7.11	8.05	9.09	9.59	8.31	6.93	5.22
$B_4P_2S_2$	4.82	5.32	5.88	6.53	7.26	6.82	5.81	7.11	7.57	8.07	8.62	9.35	8.54	7.69
SEm(±)	0.08	0.09	0.10	0.11	0.10	0.08	0.07	0.04	0.12	0.12	0.12	0.13	0.13	0.13
CD @ 1%	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Mean	5.18	5.89	6.68	7.40	7.18	6.87	5.51	7.81	8.45	9.15	9.76	9.60	8.89	7.79

Table 3: Effect of different methods of preservation on ascorbic acid (mg/100 g) and pectin (%) of guava pulp

Treatments	Ascorbic acid (mg/100 g							Pectin (%)						
	Initial	1 Month	2 Month	3 Month	4 Month	5 Month	6 Month	Initial	1 Month	2 Month	3 Month	4 Month	5 Month	6 Month
B_1	201.20	187.70	171.48	153.17	133.30	112.08	88.71	1.38	1.25	1.12	0.98	0.82	0.66	0.48
B_2	172.16	161.91	149.44	135.06	119.09	101.79	82.61	1.57	1.43	1.28	1.11	0.94	0.76	0.57
B_3	114.00	103.45	90.95	77.07	61.28	43.58	23.56	1.26	1.14	1.02	0.89	0.74	0.59	0.42
B_4	85.50	77.73	68.80	58.39	45.71	31.04	18.04	1.43	1.30	1.17	1.03	0.87	0.71	0.53
SEm(±)	1.02	1.13	1.30	1.08	1.26	0.95	0.81	0.01	0.01	0.01	0.01	0.01	0.00	0.00
CD @ 1%	3.95	4.38	5.02	4.17	4.88	3.68	3.13	0.05	0.04	0.03	0.03	0.02	0.02	0.02
P_1	143.22	134.05	122.90	110.03	95.56	79.52	60.09	1.41	1.29	1.17	1.03	0.89	0.73	0.56
P_2	143.22	131.35	117.44	101.82	84.13	64.72	46.37	1.41	1.27	1.13	0.97	0.80	0.62	0.44
SEm(±)	0.72	0.80	0.92	0.76	0.89	0.67	0.57	0.01	0.01	0.01	0.01	0.00	0.00	0.00

CD @ 1%	NS	3.10	3.55	2.95	3.45	2.60	2.21	NS	0.03	0.02	0.02	0.02	0.01	0.01
S_1	143.22	128.63	111.92	93.51	73.12	51.21	28.70	1.41	1.24	1.07	0.89	0.70	0.49	0.28
S_2	143.22	136.76	128.41	118.33	106.57	93.03	77.76	1.41	1.32	1.22	1.11	0.99	0.86	0.72
SEm(±)	0.72	0.80	0.92	0.76	0.89	0.67	0.57	0.01	0.01	0.01	0.01	0.00	0.00	0.00
CD @ 1%	NS	3.10	3.55	2.95	3.45	2.60	2.21	NS	0.03	0.02	0.02	0.02	0.01	0.01
B_1P_1	201.20	189.20	174.53	157.64	138.92	118.87	97.41	1.38	1.26	1.14	1.01	0.86	0.71	0.54
B_1P_2	201.20	186.20	168.43	148.70	127.69	105.30	80.02	1.38	1.24	1.10	0.95	0.78	0.61	0.42
B_2P_1	172.16	163.56	152.82	140.66	126.80	111.71	94.29	1.57	1.44	1.30	1.15	0.99	0.82	0.64
B_2P_2	172.16	160.26	146.06	129.46	111.38	91.87	70.93	1.57	1.41	1.25	1.08	0.89	0.70	0.49
B_3P_1	114.00	104.45	93.11	80.16	65.76	49.23	27.60	1.26	1.15	1.04	0.92	0.78	0.64	0.48
B_3P_2	114.00	102.45	88.79	73.99	56.81	37.93	19.52	1.26	1.13	1.00	0.86	0.70	0.54	0.36
B_4P_1	85.50	78.99	71.13	61.66	50.77	38.28	21.06	1.43	1.31	1.19	1.06	0.91	0.76	0.59
B_4P_2	85.50	76.47	66.46	55.13	40.65	23.80	15.02	1.43	1.29	1.15	1.00	0.83	0.66	0.47
SEm(±)	1.44	1.60	1.83	1.52	1.78	1.34	1.14	0.02	0.01	0.01	0.01	0.01	0.01	0.01
CD @ 1%	NS	NS	NS	NS	NS	5.21	4.42	NS	NS	NS	NS	NS	NS	NS
B_1S_1	201.20	183.20	162.13	138.42	112.97	86.08	56.62	1.38	1.21	1.05	0.87	0.68	0.48	0.27
B_1S_2	201.20	192.20	180.84	167.92	153.63	138.09	120.81	1.38	1.29	1.19	1.08	0.96	0.83	0.69
B_2S_1	172.16	157.46	140.17	120.69	100.16	78.83	56.18	1.57	1.38	1.20	1.00	0.79	0.57	0.34
B_2S_2	172.16	166.36	158.72	149.43	138.02	124.74	109.03	1.57	1.47	1.35	1.23	1.09	0.95	0.79
B_3S_1	114.00	99.60	83.38	66.15	47.01	25.85	2.00	1.26	1.10	0.95	0.78	0.60	0.41	0.21
B_3S_2	114.00	107.30	98.52	87.99	75.56	61.31	45.12	1.26	1.18	1.09	0.99	0.88	0.76	0.63
B_4S_1	85.50	74.26	62.03	48.79	32.35	14.08	0.00	1.43	1.26	1.10	0.92	0.73	0.53	0.32
B_4S_2	85.50	81.20	75.56	68.00	59.07	48.00	36.08	1.43	1.34	1.24	1.13	1.01	0.88	0.74
SEm(±)	1.44	1.60	1.83	1.52	1.78	1.34	1.14	0.02	0.01	0.01	0.01	0.01	0.01	0.01
CD @ 1%	NS	NS	NS	5.89	6.89	5.21	4.42	NS	NS	NS	NS	NS	NS	NS
P_1S_1	143.22	130.17	114.74	97.75	79.10	59.23	34.36	1.41	1.25	1.09	0.92	0.74	0.54	0.34
P_1S_2	143.22	137.93	131.06	122.30	112.02	99.81	85.82	1.41	1.33	1.24	1.14	1.03	0.91	0.78
P_2S_1	143.22	127.10	109.11	89.27	67.14	43.19	23.04	1.41	1.23	1.05	0.86	0.66	0.44	0.22
P_2S_2	143.22	135.60	125.76	114.37	101.12	86.26	69.70	1.41	1.31	1.20	1.08	0.94	0.80	0.65
SEm(±)	1.02	1.13	1.30	1.08	1.26	0.95	0.81	0.01	0.01	0.01	0.01	0.01	0.00	0.00
CD @ 1%	NS	NS	NS	NS	NS	NS	3.13	NS	NS	NS	NS	NS	NS	NS
$B_1P_1S_1$	201.20	185.20	165.61	143.14	118.53	92.51	65.23	1.38	1.22	1.07	0.90	0.72	0.53	0.33
$B_1P_1S_2$	201.20	193.20	183.45	172.14	159.30	145.23	129.58	1.38	1.30	1.21	1.11	1.00	0.88	0.75
$B_1P_2S_1$	201.20	181.20	158.64	133.70	107.41	79.64	48.00	1.38	1.20	1.03	0.84	0.64	0.43	0.21
$B_1P_2S_2$	201.20	191.21	178.23	163.70	147.97	130.96	112.05	1.38	1.28	1.17	1.05	0.92	0.78	0.63
$B_2P_1S_1$	172.16	159.56	143.92	126.86	108.26	89.30	68.20	1.57	1.39	1.22	1.03	0.83	0.62	0.40
$B_2P_1S_2$	172.16	167.56	161.72	154.46	145.34	134.11	120.37	1.57	1.48	1.38	1.27	1.15	1.02	0.88
$B_2P_2S_1$	172.16	155.36	136.41	114.51	92.05	68.36	44.16	1.57	1.37	1.18	0.97	0.75	0.52	0.28
$B_2P_2S_2$	172.16	165.16	155.71	144.40	130.70	115.37	97.69	1.57	1.45	1.32	1.18	1.03	0.87	0.70
$B_3P_1S_1$	114.00	100.60	85.61	69.70	52.00	31.96	4.00	1.26	1.11	0.97	0.81	0.64	0.46	0.27
$B_3P_1S_2$	114.00	108.30	100.60	90.61	79.51	66.50	51.20	1.26	1.19	1.11	1.02	0.92	0.81	0.69
$B_3P_2S_1$	114.00	98.60	81.14	62.60	42.01	19.74	0.00	1.26	1.09	0.93	0.75	0.56	0.36	0.15
$B_3P_2S_2$	114.00	106.30	96.44	85.37	71.60	56.11	39.03	1.26	1.17	1.07	0.96	0.84	0.71	0.57
$B_4P_1S_1$	85.50	75.30	63.80	51.31	37.62	23.15	0.00	1.43	1.27	1.12	0.95	0.77	0.58	0.38
$B_4P_1S_2$	85.50	82.67	78.46	72.00	63.91	53.40	42.12	1.43	1.35	1.26	1.16	1.05	0.93	0.80
$B_4P_2S_1$	85.50	73.22	60.26	46.26	27.08	5.00	0.00	1.43	1.25	1.08	0.89	0.69	0.48	0.26
$B_4P_2S_2$	85.50	79.72	72.66	64.00	54.22	42.60	30.04	1.43	1.33	1.22	1.10	0.97	0.83	0.68
SEm(±)	2.04	2.26	2.59	2.15	2.52	1.90	1.61	0.02	0.02	0.02	0.02	0.01	0.01	0.01
CD @ 1%	NS	NS	NS	NS	NS	NS	6.25	NS	NS	NS	NS	NS	NS	NS
Mean	143.22	132.70	120.17	105.92	89.84	72.12	53.23	1.41	1.28	1.15	1.00	0.84	0.68	0.50

Table 4: Effect of different methods of preservation on overall acceptability (score) of guava pulp

Treatments	Initial	1 Month	2 Months	3 Months	4 Months	5 Months	6 Months
$B_1P_1S_1$	8.80	8.18	7.42	6.51	3.90	1.00	1.00
$B_1P_1S_2$	8.80	8.57	8.33	8.06	7.75	7.32	6.74
$B_1P_2S_1$	8.80	7.87	6.97	5.86	2.00	1.00	1.00
$B_1P_2S_2$	8.80	8.52	8.23	7.93	7.60	7.11	6.50
$B_2P_1S_1$	8.54	7.92	7.08	6.12	3.45	1.00	1.00
$B_2P_1S_2$	8.54	8.28	7.93	7.55	7.13	6.62	6.04
$B_2P_2S_1$	8.54	7.55	6.67	5.66	2.00	1.00	1.00
$B_2P_2S_2$	8.54	8.21	7.82	7.40	6.92	6.39	5.86
$B_3P_1S_1$	8.27	7.67	6.85	5.76	2.00	1.00	1.00
$B_3P_1S_2$	8.27	8.00	7.70	7.31	6.85	6.32	5.75
$B_3P_2S_1$	8.27	7.12	6.30	5.19	2.00	1.00	1.00
$B_3P_2S_2$	8.27	7.96	7.60	7.21	6.78	6.27	5.62
$B_4P_1S_1$	8.00	7.26	6.41	5.37	2.00	1.00	1.00

$B_4P_1S_2$	8.00	7.72	7.40	7.03	6.60	6.19	5.51
$B_4P_2S_1$	8.00	6.91	6.00	4.95	2.00	1.00	1.00
$B_4P_2S_2$	8.00	7.67	7.28	6.84	6.34	5.75	5.13
Mean	8.40	7.84	7.25	6.55	4.71	3.75	3.45

Table 5: Effect of different methods of preservation on YMC (cfu/g) and TPC (cfu/g) of guava pulp

Treatments	YMC (cfu/g)							TPC (cfu/g)						
	Initial	1 Month	2 Month	3 Month	4 Month	5 Month	6 Month	Initial	1 Month	2 Month	3 Month	4 Month	5 Month	6 Month
$B_1P_1S_1$	ND	1.67	3.00	5.33	10.67	19.33	27.33	ND	1.33	2.33	4.67	10.00	17.00	25.00
$B_1P_1S_2$	ND	ND	1.33	2.00	3.00	4.67	6.00	ND	ND	1.00	2.00	2.33	5.00	5.00
$B_1P_2S_1$	ND	2.67	4.67	7.00	13.33	24.00	37.00	ND	2.33	4.00	6.33	12.67	20.00	34.00
$B_1P_2S_2$	ND	ND	2.33	3.00	4.00	6.33	7.33	ND	ND	2.00	2.33	3.33	6.00	6.33
$B_2P_1S_1$	ND	1.00	3.00	4.67	10.00	15.00	21.33	ND	0.67	2.33	4.00	8.67	13.33	19.00
$B_2P_1S_2$	ND	ND	1.00	1.67	2.33	3.67	5.00	ND	ND	0.00	1.00	2.00	3.00	4.00
$B_2P_2S_1$	ND	2.00	3.67	6.33	12.67	21.67	31.33	ND	1.33	3.00	5.67	11.67	19.00	29.00
$B_2P_2S_2$	ND	ND	1.33	2.67	3.33	5.00	6.33	ND	ND	1.00	2.00	3.00	5.00	5.67
$B_3P_1S_1$	ND	2.00	3.67	6.00	12.33	21.33	29.67	ND	2.00	3.00	5.00	11.67	18.67	28.00
$B_3P_1S_2$	ND	ND	1.67	2.33	3.67	4.67	6.00	ND	ND	1.00	2.00	3.00	4.00	5.00
$B_3P_2S_1$	ND	3.00	5.00	7.67	15.00	26.00	39.00	ND	2.33	4.00	7.00	13.33	25.00	36.33
$B_3P_2S_2$	ND	ND	2.67	3.67	4.67	6.67	7.67	ND	ND	2.00	3.00	4.00	6.00	6.67
$B_4P_1S_1$	ND	1.33	3.33	5.00	11.67	17.00	23.33	ND	1.00	2.33	4.00	10.33	15.33	20.00
$B_4P_1S_2$	ND	ND	1.33	2.33	3.00	4.00	5.33	ND	ND	1.00	1.33	2.33	3.67	4.67
$B_4P_2S_1$	ND	2.33	4.33	6.67	14.33	23.33	33.33	ND	1.67	3.67	6.00	13.00	21.00	30.33
$B_4P_2S_2$	ND	ND	1.67	3.00	3.67	5.33	6.67	ND	ND	1.00	2.33	2.67	4.67	6.00
Mean	0.00	1.00	2.75	4.33	7.98	13.00	18.29	0.00	0.79	2.10	3.67	7.13	11.67	16.56

Conclusion

Pulp extracted from fully ripe fruit of cv. Sardar without blanching by screw type pulp extractor, packed in retortable pouch and stored in cold storage ($B_1P_1S_2$) recorded higher values for important quality parameters like TSS, reducing sugars, total sugars and ascorbic acids. Minimum microbial count was observed in pulp extracted from fully ripe fruit of cv. Sardar with blanching by screw type pulp extractor, packed in retortable pouch and stored in cold storage ($B_2P_1S_2$). Pulp extracted from fully ripe fruit without blanching by screw type pulp extractor, packed in retortable pouch recorded higher sensory quality and can be stored up to 6 and 3 months, respectively in cold storage and ambient conditions with acceptable quality in both cultivars.

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