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Development of blended juice using banana pseudostem sap blended with noni, *Aloe vera* and guava

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Abstract

The present investigation entitled “Development of blended juice using banana pseudostem sap blended with noni, *Aloe vera* and guava” was carried out with the objectives to study the effect of blending proportion on nutritional quality of the blended juice as well as to study the storage stability of blended juice with 16 treatments along with different blending combinations of banana pseudostem sap: noni: *Aloe vera*: guava, filled in polyethylene terephthalate bottles and stored at room temperature up to 6 months. Chemical, nutritional and microbial parameters were recorded at initial, 2, 4 and 6 months of storage. Results revealed that, best quality blended juice with stable nutritional quality can be prepared using 80 per cent banana pseudostem sap, 5 per cent noni juice, 5 per cent *Aloe vera* juice and 10 per cent guava pulp.

Keywords: blended juice, banana pseudostem sap and room temperature

Introduction

Banana is one of the major fruit crop grown in India. Apart from the fruit, it also generates huge amount of biomass in the form of pseudostem, suckers and leaves *etc.* In India, around 64 million tones of waste is generated in the form of pseudostem. This biomass is wasting in most of the states of India also making the farmers to spend around Rs 12, 000 to 15,000 per ha for disposal. Disposal of biomass is done by dumping on the field bunds, natural drains and burning. Thus, it creates environmental pollution and also act as best host for pest and diseases growth. Hence, there is a scope to utilize this waste and prepare value added products from the banana pseudostem. Thus, it also helps to increase the farmer’s income. Banana pseudostem juice is nontoxic and can be used as adjuvant in preventing diabetic and cancer therapies to prevent toxic effect that result due to long term administration of chemo-therapeutic agents (Abirami *et al.*, 2014) [1]. Maximum quantity of pseudostem is dumped along the field bunds. This can be used effectively for preparation of processed products that will also increase the farmer’s income. Blending of juices will helps in improving minerals and vitamins content and it also helps to increase the organoleptic quality of the product that depends on types of fruits and vegetables used for blending (De Carvalho *et al.*, 2007) [4]. Noni, *Aloe vera* and guava juices were used for blending with banana pseudostem to increase the sensory as well as nutritional quality of the blended juice.

Materials and Methods

Collection of raw materials

Banana pseudostems of variety Grand naine were harvested from the fields of Soil and Water Management Research Unit, Navsari Agricultural University, Navsari, Gujarat immediately after harvesting of bunch in the first week of April. The banana pseudostems were washed outer sheaths were removed. Pseudostem was split by sharp stainless steel knife and washed. From the sheaths juice was extracted with the use of sugarcane juice and filtered by using muslin cloth. Fully ripened fruits of noni were harvested from the farm of Navsari Agricultural University, Navsari (Gujarat), the fruits were smashed and 2 g of pectinase enzyme per kg of fruit pulp was added then mixed thoroughly and kept for about 6 hours. Noni juice was extracted using hydraulic press. The extracted juice was filtered using whatman’s filter paper 42 pore size then boiled until we get a clear juice and filled in glass bottles. Fully developed slips of *Aloe vera* were harvested from the farm of Navsari Agricultural University, Navsari (Gujarat).

After sorting the gel was extensively washed with drinkable water followed by cutting into small pieces and pre-treated with soybean extract (1.5% for 12 h) to remove aoin content (US Patent, 2007). Then juice was extracted from gel using crusher type juice extractor. The juice was further boiled at 95 °C for 30 minutes then filled in glass bottles. Fully ripened guava fruits of variety Allahabad safeda were sorted and then washed. The washed fruits were cut into small pieces and boiled with 300 ml water per kg of fruits. After cooling, the pulp was extracted using fruit pulper. Then the pulp was boiled at 95 °C for 30 minutes. Pulp was filled in polyethylene bags and was cooled by keeping them in cold water.

Preparation of blended juice

Blending of extracted juice/ pulp with freshly extracted banana pseudostem juice as per different treatments. Sugar and citric acid was added to the blended juice as per the standardization to maintain 15 °Brix TSS and 0.3 Per cent acidity. The blended juice was heated up to 95 °C for 5 minutes. Heated juice was filled in properly washed polyethylene terephthalate bottles of 200 ml capacity with adding any preservatives. It was followed by cooling and stored under ambient condition with mean temperature of 33°C and relative humidity of 87%. The experiment was carried out using 16 treatments with 3 repetitions. The different treatment combinations were presented in Table 1.

Table 1: Treatment details with different blending proportions

Treatments	Banana pseudostem sap (%)	Noni juice (%)	Aloe vera juice (%)	Guava pulp (%)
T ₁	100	0	0	0
T ₂	80	0	0	20
T ₃	80	0	5	15
T ₄	80	0	10	10
T ₅	80	0	15	5
T ₆	80	0	20	0
T ₇	80	5	5	10
T ₈	80	5	10	5
T ₉	80	5	15	0
T ₁₀	80	5	0	15
T ₁₁	80	10	0	10
T ₁₂	80	10	10	0
T ₁₃	80	10	5	5
T ₁₄	80	15	5	0
T ₁₅	80	15	0	5
T ₁₆	80	20	0	0

Assessment of physico-chemical and microbial parameters

The prepared blended juice was analyzed periodically for physico-chemical and microbial parameters at initial, 2, 4 and 6 months interval. The TSS content of blended juice was measured using abbe's refractometer. Titrable acidity was estimated using 0.1% NaOH as per Ranganna (1986) [10]. Ascorbic acid was estimated using AOAC method. The carbohydrates content was estimated by anthrone method suggested by Sadasivam and Manickam, (1991) [11]. Total phenols were estimated by measuring optical density at 660nm. The Calorific value was calculated using the Atwater factor method as described by Eneche (1991) [6]. Protein content was estimated by Lowry's method as described by Sadasivam and Manickam (1991) [11]. Iron content was estimated by Atomic Absorption Spectrophotometer and

potassium content was analyzed by flame photometric method. Microbial analysis was carried out y standard plate count method. All these methods were carried as described by Ranganna (1986) [10].

Statistical Analysis

Experiment data were statistically analyzed using Completely Randomized Design (CRD) as described by Panse and Shukatme (1985) [8] at the Department of Agricultural Statistics, ASPEE College of Horticulture, Navsari, Gujarat.

Results and Discussion

TSS

The level of TSS in blended juice varied according to the fruits used for blending in different treatments. Storage period of 6 months showed significantly increased TSS content in all the treatments as recorded in Table 2. Increased TSS during the storage was due to conversion of polysaccharides like starch, cellulose and pectin substances into simple sugars. Similar results were recorded by Borane and Khan Sumaiya (2015) [3] in blended banana pseudostem juice with papaya during 90 days of storage period.

Table 2: Effect of blending of banana pseudostem sap with noni, *Aloe vera* and guava juice on TSS (°Brix) during storage

Treatments	Storage Period (P)				Mean (T)
	P1 (Initial)	P2 (2 month)	P3 (4 month)	P4 (6 month)	
T ₁ (100:0:0:0)	15.00	15.23	15.39	15.63	15.31
T ₂ (80:0:0:20)	15.01	15.37	15.54	15.66	15.40
T ₃ (80:0:5:15)	15.00	15.31	15.50	15.72	15.38
T ₄ (80:0:10:10)	15.01	15.22	15.49	15.70	15.36
T ₅ (80:0:15:5)	15.00	15.26	15.45	15.68	15.35
T ₆ (80:0:20:0)	15.00	15.24	15.43	15.65	15.33
T ₇ (80:5:5:10)	15.00	15.35	15.47	15.75	15.39
T ₈ (80:5:10:5)	15.00	15.30	15.48	15.72	15.38
T ₉ (80:5:15:0)	15.00	15.26	15.47	15.67	15.35
T ₁₀ (80:5:0:15)	15.00	15.36	15.50	15.70	15.39
T ₁₁ (80:10:0:10)	15.00	15.37	15.49	15.75	15.40
T ₁₂ (80:10:10:0)	15.01	15.29	15.47	15.74	15.38
T ₁₃ (80:10:5:5)	15.00	15.34	15.44	15.76	15.39
T ₁₄ (80:15:5:0)	15.00	15.36	15.49	15.67	15.38
T ₁₅ (80:15:0:5)	15.00	15.38	15.53	15.63	15.39
T ₁₆ (80:20:0:0)	15.02	15.42	15.57	15.71	15.43
Mean (P)	15.00	15.32	15.48	15.70	
	Treatment (T)	Period (P)	TXP		
S.Em. ±	0.063	0.021	0.084		
C.D. at 5%	NS	0.059	NS		
C.V. %	1.43		0.95		

Titration acidity (%)

The highest titration acidity was recorded in the treatment T₁₆ and T₁₅ (0.38%) and lowest titration acidity was recorded in treatment T₁ (0.34%) have been presented in Table 3. During 6 months of storage titration acidity of blended juice increased significantly. The increased titration acidity during storage was due to the blending effect of different fruits used for blending and also due to the accelerated degradation of pectin substances, sugars and formation of organic acid during storage. Similar results were also observed by Thirukkumar *et al.* (2018) [14] in noni fruit juice blended squash with amla juice during 180 days of storage.

Table 3: Effect of blending of banana pseudostem sap with noni, *Aloe vera* and guava juice on titrable acidity (%) during storage

Treatments	Storage Period (P)				Mean (T)
	P1 (Initial)	P2 (2 month)	P3 (4 month)	P4 (6 month)	
T ₁ (100:0:0:0)	0.29	0.32	0.36	0.38	0.34
T ₂ (80:0:0:20)	0.30	0.36	0.38	0.42	0.37
T ₃ (80:0:5:15)	0.30	0.35	0.38	0.42	0.36
T ₄ (80:0:10:10)	0.30	0.34	0.38	0.41	0.36
T ₅ (80:0:15:5)	0.30	0.33	0.37	0.39	0.35
T ₆ (80:0:20:0)	0.29	0.33	0.37	0.39	0.34
T ₇ (80:5:5:10)	0.30	0.34	0.38	0.39	0.36
T ₈ (80:5:10:5)	0.30	0.33	0.37	0.41	0.35
T ₉ (80:5:15:0)	0.30	0.33	0.37	0.42	0.35
T ₁₀ (80:5:0:15)	0.30	0.35	0.38	0.40	0.36
T ₁₁ (80:10:0:10)	0.30	0.35	0.38	0.43	0.37
T ₁₂ (80:10:10:0)	0.30	0.34	0.39	0.41	0.36
T ₁₃ (80:10:5:5)	0.30	0.35	0.37	0.42	0.36
T ₁₄ (80:15:5:0)	0.30	0.34	0.38	0.44	0.37
T ₁₅ (80:15:0:5)	0.31	0.36	0.39	0.45	0.38
T ₁₆ (80:20:0:0)	0.31	0.37	0.40	0.46	0.38
Mean (P)	0.30	0.34	0.38	0.41	
	Treatment (T)	Period (P)	TXP		
S.Em. ±	0.004	0.001	0.006		
C.D. at 5%	0.012	0.003	0.017		
C.V. %	3.94		2.74		

Ascorbic acid (mg/100 ml)

The ascorbic acid content of blended juice was highest in treatment T₂ (23.53 mg/100 ml) and lowest treatment T₁ (16.18 mg/100 ml) have been recorded in Table 4. Ascorbic acid content varied according to the blending ratio of fruits and the lowest level found in T₁ due to low ascorbic acid in banana pseudostem sap. Storage studies showed significantly decreasing trend in ascorbic acid content of blended as ascorbic acid was sensitive to oxygen, light and heat was easily oxidized in presence of oxygen during storage. Similar findings were reported by Patel *et al.* (2018)^[9] in evaluation of some late varieties of mango nectar product processing.

Table 4: Effect of blending of banana pseudostem sap with noni, *Aloe vera* and guava juice on ascorbic acid (mg/100 ml) during storage

Treatments	Storage Period (P)				Mean (T)
	P1 (Initial)	P2 (2 month)	P3 (4 month)	P4 (6 month)	
T ₁ (100:0:0:0)	17.14	16.69	15.70	15.20	16.18
T ₂ (80:0:0:20)	24.96	23.94	22.97	22.25	23.53
T ₃ (80:0:5:15)	23.43	22.86	21.91	21.37	22.39
T ₄ (80:0:10:10)	22.83	22.11	21.16	20.28	21.60
T ₅ (80:0:15:5)	19.64	19.07	18.26	17.77	18.69
T ₆ (80:0:20:0)	17.89	17.31	16.15	15.57	16.73
T ₇ (80:5:5:10)	22.60	22.14	21.39	20.87	21.75
T ₈ (80:5:10:5)	20.44	19.94	18.93	18.42	19.43
T ₉ (80:5:15:0)	18.28	17.73	16.92	16.24	17.29
T ₁₀ (80:5:0:15)	23.42	22.95	21.91	21.25	22.38
T ₁₁ (80:10:0:10)	23.06	22.61	21.71	21.19	22.14
T ₁₂ (80:10:10:0)	18.49	17.91	16.96	16.21	17.39
T ₁₃ (80:10:5:5)	21.01	20.36	19.61	19.08	20.02
T ₁₄ (80:15:5:0)	19.00	18.04	17.29	16.08	17.60
T ₁₅ (80:15:0:5)	21.73	21.21	20.23	19.09	20.57
T ₁₆ (80:20:0:0)	19.39	18.98	18.13	17.46	18.49
Mean (P)	20.83	20.24	19.33	18.65	
	Treatment (T)	Period (P)	TXP		
S.Em.±	0.286	0.036	0.143		
C.D. at 5%	0.823	0.100	NS		
C.V. %	5.00		1.25		

Carbohydrates (%)

The highest carbohydrates level was found in treatment T₂ (43.19%) and the lowest carbohydrates content was observed in treatment T₁ (32.21%) have been recorded in Table 5, it was due to higher carbohydrates content in guava and lower carbohydrates content in banana pseudostem juice. It showed significantly decreasing trend during 6 months of storage period. The decreasing trend was due to the hydrolysis of polysaccharides like pectin, starch *etc.* into simple sugars. Similar finding were reported by Shiva *et al.* (2018)^[12] in banana pseudostem based novel functional blended ready to drink beverages with ginger rhizome and nannari root extracts during 6 months of storage.

Table 5: Effect of blending of banana pseudostem sap with noni, *Aloe vera* and guava juice on carbohydrates (%) during storage

Treatments	Storage Period (P)				Mean (T)
	P1 (Initial)	P2 (2 month)	P3 (4 month)	P4 (6 month)	
T ₁ (100:0:0:0)	17.09	17.02	16.91	16.83	16.96
T ₂ (80:0:0:20)	18.36	18.27	18.20	18.11	18.24
T ₃ (80:0:5:15)	18.19	18.12	18.05	17.97	18.08
T ₄ (80:0:10:10)	17.85	17.79	17.72	17.67	17.56
T ₅ (80:0:15:5)	17.30	17.24	17.21	17.14	17.22
T ₆ (80:0:20:0)	17.15	17.11	17.03	16.94	17.06
T ₇ (80:5:5:10)	18.07	18.00	17.93	17.79	17.95
T ₈ (80:5:10:5)	17.59	17.57	17.44	17.34	17.49
T ₉ (80:5:15:0)	17.36	17.30	17.19	17.04	17.22
T ₁₀ (80:5:0:15)	18.30	18.21	18.10	17.90	18.19
T ₁₁ (80:10:0:10)	18.03	17.97	17.89	17.78	17.92
T ₁₂ (80:10:10:0)	17.38	17.33	17.29	17.15	17.29
T ₁₃ (80:10:5:5)	17.62	17.51	17.45	17.41	17.51
T ₁₄ (80:15:5:0)	17.32	17.25	17.18	17.05	17.20
T ₁₅ (80:15:0:5)	17.64	17.58	17.48	17.34	17.51
T ₁₆ (80:20:0:0)	17.54	17.46	17.33	17.16	17.37
Mean (P)	17.66	17.61	17.53	17.42	
	Treatment (T)	Period (P)	TXP		
S.Em. ±	0.226	0.018	0.071		
C.D. at 5%	0.651	0.050	NS		
C.V. %	4.46		0.70		

Proteins (%)

The maximum proteins were recorded in treatment T₂ (0.98%) and minimum in treatment T₁ (0.53%) have been presented in Table 6. This was due to the lower proteins content in banana pseudostem juice and higher proteins content in guava pulp. Proteins level in blended juice decreased significantly during 6 months storage period due to denaturation and oxidation proteins during storage. Similar findings were reported by Deshmukh *et al.* (2019) [5] in blended aonla and *Aloe vera* nectar with stevia as a sugar substitute.

Table 6: Effect of blending of banana pseudostem sap with noni, *Aloe vera* and guava juice on proteins (%) during storage

Treatments	Storage Period (P)				Mean (T)
	P1 (Initial)	P2 (2 month)	P3 (4 month)	P4 (6 month)	
T ₁ (100:0:0:0)	0.58	0.56	0.51	0.46	0.53
T ₂ (80:0:0:20)	1.04	1.02	0.95	0.91	0.98
T ₃ (80:0:5:15)	0.92	0.90	0.85	0.83	0.88
T ₄ (80:0:10:10)	0.85	0.84	0.81	0.80	0.82
T ₅ (80:0:15:5)	0.72	0.69	0.66	0.65	0.68
T ₆ (80:0:20:0)	0.64	0.62	0.58	0.57	0.61
T ₇ (80:5:5:10)	0.87	0.86	0.84	0.81	0.84
T ₈ (80:5:10:5)	0.73	0.70	0.67	0.66	0.69
T ₉ (80:5:15:0)	0.70	0.67	0.63	0.61	0.65
T ₁₀ (80:5:0:15)	0.97	0.94	0.90	0.89	0.92
T ₁₁ (80:10:0:10)	0.80	0.76	0.72	0.70	0.75
T ₁₂ (80:10:10:0)	0.67	0.64	0.60	0.59	0.62
T ₁₃ (80:10:5:5)	0.79	0.76	0.71	0.70	0.74
T ₁₄ (80:15:5:0)	0.75	0.71	0.68	0.64	0.69
T ₁₅ (80:15:0:5)	0.76	0.73	0.69	0.68	0.71
T ₁₆ (80:20:0:0)	0.73	0.71	0.66	0.65	0.69
Mean (P)	0.78	0.76	0.72	0.70	
	Treatment (T)	Period (P)	TXP		
S.Em. ±	0.014	0.002	0.009		
C.D. at 5%	0.040	0.006	0.025		
C.V. %	6.06		1.99		

Iron (mg/100 ml)

The highest iron content (0.82 mg/100 ml) was reported in treatment T₆ and lowest iron content (0.31 mg/100 ml) were recorded in the treatment T₁₆ have been presented in Table 7. Iron content in all the treatments varied according to the iron content present in the fruits used for blending and their

blending ratio in preparation of blended juice. During storage iron content of blended juice showed slightly decreasing trend, this was due to the interaction between chemical organic constituents of juice induced by high temperature actions and presence of catalyst as reported by Kumar *et al.* (2012) [7].

Table 7: Effect of blending of banana pseudostem sap with noni, *Aloe vera* and guava juice on iron (mg/100 ml) during storage

Treatments	Storage Period (P)				Mean (T)
	P1 (Initial)	P2 (2 month)	P3 (4 month)	P4 (6 month)	
T ₁ (100:0:0:0)	0.46	0.45	0.44	0.43	0.44
T ₂ (80:0:0:20)	0.84	0.82	0.81	0.79	0.81
T ₃ (80:0:5:15)	0.75	0.73	0.72	0.71	0.73
T ₄ (80:0:10:10)	0.76	0.74	0.72	0.71	0.73
T ₅ (80:0:15:5)	0.82	0.79	0.78	0.76	0.79
T ₆ (80:0:20:0)	0.85	0.83	0.82	0.80	0.82
T ₇ (80:5:5:10)	0.75	0.74	0.73	0.72	0.73
T ₈ (80:5:10:5)	0.76	0.73	0.72	0.70	0.73
T ₉ (80:5:15:0)	0.65	0.64	0.63	0.61	0.63
T ₁₀ (80:5:0:15)	0.71	0.68	0.68	0.66	0.68
T ₁₁ (80:10:0:10)	0.66	0.64	0.63	0.62	0.64
T ₁₂ (80:10:10:0)	0.54	0.52	0.51	0.49	0.52
T ₁₃ (80:10:5:5)	0.53	0.51	0.49	0.48	0.50
T ₁₄ (80:15:5:0)	0.41	0.39	0.37	0.36	0.38
T ₁₅ (80:15:0:5)	0.36	0.34	0.33	0.32	0.34
T ₁₆ (80:20:0:0)	0.33	0.32	0.30	0.29	0.31
Mean (P)	0.64	0.62	0.60	0.59	
	Treatment (T)	Period (P)	TXP		
S.Em. ±	0.010	0.002	0.007		
C.D. at 5%	0.029	0.006	NS		
C.V. %	5.17		2.01		

Total phenols (mg/100 ml)

The highest total phenols (42.55 mg/100 ml) were observed in treatment T₁₆ and lowest total phenols (9.11 mg/100 ml) were recorded in treatment T₁ have been presented in Table 8. The variation between the treatments for total phenols depends up on the blending ratio.

Decreasing trend of total phenols were recorded during storage period of 6 months. This due to their oxidation during storage period, similar results were recorded by Tahasildar (2016) [13] also reported similar findings in preparation of blended nectar using *Aloe vera*, guava and jamun.

Table 8: Effect of blending of banana pseudostem sap with noni, *Aloe vera* and guava juice on total phenols (mg/100 ml) during storage

Treatments	Storage Period (P)				Mean (T)
	P1 (Initial)	P2 (2 month)	P3 (4 month)	P4 (6 month)	
T ₁ (100:0:0:0)	11.21	9.72	8.69	6.83	9.11
T ₂ (80:0:0:20)	13.43	11.37	10.13	7.94	10.72
T ₃ (80:0:5:15)	16.39	13.36	11.90	10.17	12.96
T ₄ (80:0:10:10)	20.69	18.29	16.31	14.73	17.51
T ₅ (80:0:15:5)	21.20	20.10	18.10	15.84	18.81
T ₆ (80:0:20:0)	22.46	20.73	17.93	16.29	19.35
T ₇ (80:5:5:10)	24.94	21.60	19.38	17.28	20.80
T ₈ (80:5:10:5)	27.59	23.19	20.73	19.08	22.65
T ₉ (80:5:15:0)	29.16	26.13	22.9	19.44	24.38
T ₁₀ (80:5:0:15)	27.80	25.30	23.49	21.35	24.49
T ₁₁ (80:10:0:10)	32.10	30.04	27.37	26.10	28.90
T ₁₂ (80:10:10:0)	38.89	36.22	33.35	29.85	34.58
T ₁₃ (80:10:5:5)	37.52	34.86	32.19	30.32	33.72
T ₁₄ (80:15:5:0)	41.95	38.78	36.45	35.05	38.06
T ₁₅ (80:15:0:5)	40.55	37.07	35.07	33.80	36.62
T ₁₆ (80:20:0:0)	46.93	44.26	40.50	38.50	42.55
Mean (P)	28.30	25.69	23.40	21.41	

	Treatment (T)	Period (P)	TXP		
S.Em. \pm	0.432	0.111	0.445		
C.D. at 5%	1.244	0.311	1.248		
C.V. %	6.06		3.12		

Calorific value (Kcal/100 ml)

The maximum calorific value (181.35 Kcal/100 ml) was recorded in the treatment T₂ and the minimum calorific value (131.30 Kcal/100 ml) was observed in treatment T₁ have been presented in Table 9. It showed decreasing trend during storage. Calorific value of blended juice varied according to the proteins, fat and carbohydrates content in blended juice. These findings were also supported by Anonymous (2015) [2] ready to serve beverage from banana pseudostem sap during 6 months storage period.

Table 9: Effect of blending of banana pseudostem sap with noni, *Aloe vera* and guava juice on calorific value (Kcal/100 ml) during storage

Treatments	Storage Period (P)				Mean (T)
	P1 (Initial)	P2 (2 month)	P3 (4 month)	P4 (6 month)	
T ₁ (100:0:0:0)	71.16	70.67	70.00	69.38	70.30
T ₂ (80:0:0:20)	78.05	77.54	76.94	76.34	77.22
T ₃ (80:0:5:15)	76.88	76.43	75.93	75.43	76.16
T ₄ (80:0:10:10)	75.23	74.87	74.45	74.06	74.65
T ₅ (80:0:15:5)	72.52	72.10	71.78	71.37	71.95
T ₆ (80:0:20:0)	71.63	71.28	70.79	70.27	70.40
T ₇ (80:5:5:10)	76.18	75.80	75.39	74.62	75.50
T ₈ (80:5:10:5)	73.72	73.46	72.77	72.21	73.04
T ₉ (80:5:15:0)	72.66	72.24	71.62	70.88	71.84
T ₁₀ (80:5:0:15)	77.52	76.96	76.30	75.40	76.54
T ₁₁ (80:10:0:10)	75.80	75.27	74.74	74.15	74.10
T ₁₂ (80:10:10:0)	72.64	72.23	71.89	71.16	71.98
T ₁₃ (80:10:5:5)	74.08	73.43	72.95	72.82	73.32
T ₁₄ (80:15:5:0)	72.78	72.22	71.72	70.99	71.92
T ₁₅ (80:15:0:5)	74.07	73.58	72.98	72.31	73.24
T ₁₆ (80:20:0:0)	73.54	73.01	72.30	71.45	72.57
Mean (P)	74.28	73.82	73.29	72.67	
	Treatment (T)	Period (P)	TXP		
S.Em. \pm	0.908	0.071	0.284		
C.D. at 5%	2.614	0.199	NS		
C.V. %	4.28		0.67		

Total plate count (cfu/ml)

There was no microbial growth observed in the blended juice up to 6 months of storage at ambient temperature.

Conclusion

As per the objective to study the effect of blending proportion of nutritional quality and storage stability of blended juice, best quality blended juice with stable nutritional quality and good storage stability can be prepared using 80 per cent banana pseudostem sap, 5 per cent noni juice, 5 per cent *Aloe vera* juice and 10 per cent guava pulp i.e., T₇. It can be stored successfully for 6 months in PET bottles in ambient temperature. Utilization of banana pseudostem juice helps to reduce the cost of production as well as it helps to increase nutritional status of product

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