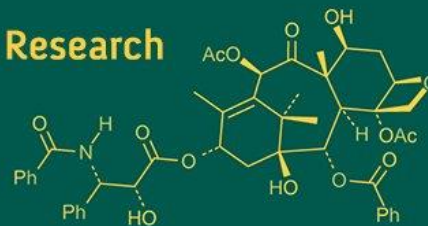
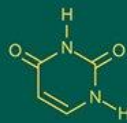
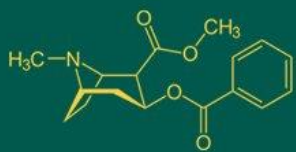


## International Journal of Advanced Biochemistry Research



ISSN Print: 2617-4693  
 ISSN Online: 2617-4707  
 IJABR 2025; SP-9(1): 977-980  
[www.biochemjournal.com](http://www.biochemjournal.com)  
 Received: 13-10-2024  
 Accepted: 16-11-2024

**Hina Manjhi**  
 Ph.D. Horticulture, Fruit  
 Science, COA Gwalior,  
 RVSKVV, Gwalior, Madhya  
 Pradesh, India

**Dr. Karan Vir Singh**  
 Senior Scientist, Department  
 of Horticulture, RVSKVV,  
 Gwalior, Madhya Pradesh,  
 India

**Dr. Arjun Kashyap**  
 Assistant Professor (Cont.),  
 COA Sehore, RVSKVV,  
 Gwalior, Madhya Pradesh,  
 India

**Corresponding Author:**  
**Hina Manjhi**  
 Ph.D. Horticulture, Fruit  
 Science, COA Gwalior,  
 RVSKVV, Gwalior, Madhya  
 Pradesh, India

## Effect of different fruit and medicinal plant extract on total sugar, reducing sugar and non-reducing sugar of blended guava nectar

Hina Manjhi, Karan Vir Singh and Arjun Kashyap

DOI: <https://doi.org/10.33545/26174693.2025.v9.i1Sm.3651>

### Abstract

The present investigation entitled “Evaluation of blended guava nectar with different fruit and medicinal plant extract” was conducted for two consecutive years 2022-23 and 2023-24 in Laboratory Horticulture, College of Agriculture, Gwalior (M.P.). Guava (*Psidium guajava* L.) is one of the most common fruits in India. It belongs to family *Myrtaceae* and genus *Psidium* contains about 150 species. Guava also called the “Apple of Tropics” and “Poor man’s apple” and the guava fruit is normally consumed as fresh as a dessert fruit or in processed form as puree, juice, concentrate, jam, jelly, cheese, toffee, fruit flakes, squash, syrup, nectar, powder, wine and vinegar, ready to use snacks, drinks and dehydrated canned products. The processing of fruit in to various products is one of the best ways to reduce the losses. The fruit nectar is one of the most delicious products being prepared from fruit pulp. Blended nectar beverage based on blends of guava, aonla, *Aloe vera*, tamarind, carambola, ginger, tulsi and pudina juice extracts receiving a considerable amount of attention reflecting a growing awareness of the potential of these products in the market place. Thus beverages have high nutritional quality and increased energy value especially therapeutic properties into the beverages. These could be particularly useful in place where there is lack of food and improper nutrition. The experiment comprised of twenty two treatments consisting of various concentration of edible fruit pulp and juice viz., aonla juice, tamarind pulp, *Aloe vera* pulp, ginger juice, carambola juice, tulsi leaf extract and pudina leaf extract. The experiment was laid out in Completely Randomized Design (CRD). All the treatments were replicated thrice. Result concluded that the treatments consisting of different edible fruit pulp and juice of aonla juice, tamarind pulp, *Aloe vera* pulp, ginger juice, carambola juice, tulsi leaf extract and pudina leaf extract were statistically influenced the chemical composition and sensory parameters of blended guava nectar. It was observed that the treatment T<sub>16</sub> – Guava pulp 94% + Carambola juice 6% was found the best treatment for preparation of blended guava nectar as compared to rest of treatments and it was also recorded the maximum chemical composition and sensory parameters of blended guava nectar.

**Keywords:** Guava nectar, aonla juice, tamarind pulp, *Aloe vera* pulp, ginger juice, carambola juice, tulsi leaf extract, pudina leaf extract and medicinal plant extract

### Introduction

Guava (*Psidium guajava* L.) is one of the most common fruits in India. It is believed to be introduced in India early in the 17<sup>th</sup> century, it belongs to family *Myrtaceae* and genus *Psidium* contains about 150 species (Hayes, 1970). In India, Guava is cultivated in an area of 304 thousand hectares with production of 4433 thousand MT (Anonymous, 2021-22) [2]. Guava also called the “Apple of Tropics” and “Poor man’s apple” and the fruit consists of 20% peel, 50% flesh portion and seed core. 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%). Guava fruit is normally consumed as fresh as a dessert fruit or in processed form as puree, juice, concentrate, jam, jelly, cheese, toffee, fruit flakes, squash, syrup, nectar, powder, wine and vinegar, ready to use snacks, drinks and dehydrated canned products. The processing of fruit in to various products is one of the best ways to reduce the losses (Lavanya *et al.*, 2018) [10]. The fruit nectar is one of the most delicious products being prepared from fruit pulp. Blended nectar beverage based on blends of guava, aonla, *Aloe vera*, tamarind, carambola, ginger, tulsi and pudina juice extracts receiving a considerable amount of attention reflecting a growing

awareness of the potential of these products in the market place. Thus beverages have high nutritional quality and increased energy value especially therapeutic properties into the beverages. These could be particularly useful in place where there is lack of food and improper nutrition (Khan and Ayub, 2020) [9]. Food commodities like guava and underutilized medicinal fruit like aonla, *Aloe vera*, tamarind, carambola, ginger, tulsi and pudina leaf extract are used for the beneficial effects and are being used to cure different degenerative diseases. Several fruit beverages are not preferred by the consumer due to their inherent acidic and astringent taste but the acceptance of these beverages can be increased by blending with guava fruits having acceptable taste and flavour (Gaikwad *et al.*, 2022) [5].

### Materials and Methods

The present experiment was conducted in Laboratory Horticulture, College of Agriculture, Gwalior (M.P.). For the experiment, fresh guava fruits were collected from Dry land Horticulture Farm, Sirsod, College of Agriculture, Gwalior and fresh aonla fruits were collected from Krishi Vigyan Kendra, Gwalior, while tamarind and ginger was purchased from local market of Gwalior. Fresh *Aloe vera*, tulsi, pudina leaves and carambola fruits were collected from the nursery of College of Agriculture, Gwalior. The fruits were harvested along some pedicle to avoid spoilage of the fruit during storage. After procurement, the fruits were immediately brought to the laboratory of the Department of Horticulture, College of Agriculture, Gwalior for further treatments. The experiment comprised of twenty two treatments consisting of various concentration of edible fruit pulp and juice *viz.*, aonla juice, tamarind pulp, *Aloe vera* pulp, ginger juice, carambola juice, tulsi leaf extract and pudina leaf extract. The experiment was laid out in Completely Randomized Design (CRD). All the treatments were replicated thrice.

### Result and Discussion

#### Total sugar (%)

Result reported that there was no significant influenced found in total sugar content percent of guava nectar at 0 days after storage. The maximum total sugar (%) was recorded in treatment T<sub>16</sub> – Guava pulp 94% + Carambola juice 6% and it was significantly superior treatment as compared to rest of treatments. However, the minimum total sugar (%) was recorded in treatment T<sub>1</sub> – Guava pulp 100% in first year, second year and in pooled at 0, 30, 60, 90 and

120 days after storage, respectively. An increase in total sugar might be due to inversion of sucrose into glucose and fructose under the acidic condition. Similar results for most of the characters were also reported by Mehta *et al.* (2018) [11], Kaushal *et al.* (2019) [8], Bhadouriya *et al.* (2022) [3] and Gaikwad *et al.* (2022) [5].

#### Reducing sugar (%)

There was no significant influenced found in reducing sugar percent of guava nectar at 0 days after storage. It was noted that the maximum reducing sugar (%) was recorded in treatment T<sub>16</sub> – Guava pulp 94% + Carambola juice 6% and it was significantly superior treatment as compared to rest of treatments. However, the minimum reducing sugar (%) was recorded in treatment T<sub>1</sub> – Guava pulp 100% in first year, second year and in pooled at 0, 30, 60, 90 and 120 days after storage, respectively. The change in different sugar fraction could be due to hydrolysis of polysaccharides such as starch, pectin and the inversion of non-reducing sugar into reducing sugar as increase in reducing sugar was correlated with the decrease in non-reducing sugar. The increase in reducing sugars might be due to hydrolysis of sugar by acid, which might have resulted in degradation of disaccharides to mono-saccharides. This statement is justified in light of research carried out by Bogha *et al.* (2020) [4], Sangani *et al.* (2021) [12] and Verma *et al.* (2024) [13].

#### Non-reducing sugar (%)

It was recorded that no significant influenced found in non-reducing sugar percent of guava nectar at 0, 30, 60, 90 and 120 days after storage. The maximum non-reducing sugar (%) was recorded in treatment T<sub>16</sub> – Guava pulp 94% + Carambola juice 6% and the minimum non-reducing sugar (%) was recorded in treatment T<sub>1</sub> – Guava pulp 100% in first year, second year and in pooled at 0, 30, 60, 90 and 120 days after storage, respectively. The increase in reducing sugar as well as total sugar corresponded to the increase in total soluble solids and ultimate decrease in non-reducing sugar in the beverages during storage period. The variation in different fraction of sugar might be due to hydrolysis of polysaccharides like starch, pectin and inversion of non-reducing sugar into reducing sugar, as increased in reducing sugar was correlated with the decrease in non-reducing sugar. Findings are in agreement with those of Kaushal *et al.* (2019) [8], Ahirrao *et al.* (2022) [1] and Gaikwad *et al.* (2022) [5].

**Table 1:** Effect of blended guava nectar with different fruit and medicinal plant extract on total sugar (%)

Treatments detail	Total sugar (%)														
	I <sup>st</sup> Year					II <sup>nd</sup> Year					Pooled				
	0 DAS	30 DAS	60 DAS	90 DAS	120 DAS	0 DAS	30 DAS	60 DAS	90 DAS	120 DAS	0 DAS	30 DAS	60 DAS	90 DAS	120 DAS
T <sub>1</sub> – Guava pulp 100%	15.90	16.00	16.25	16.39	16.70	15.93	16.03	16.21	16.41	16.72	15.92	16.02	16.23	16.40	16.71
T <sub>2</sub> – Guava pulp 98% + Aonla juice 2%	16.01	16.10	16.29	16.53	16.74	15.95	16.07	16.31	16.54	16.76	15.98	16.09	16.30	16.54	16.75
T <sub>3</sub> – Guava pulp 96% + Aonla juice 4%	16.12	16.23	16.40	16.74	16.88	16.14	16.21	16.42	16.71	16.91	16.13	16.22	16.41	16.72	16.90
T <sub>4</sub> – Guava pulp 94% + Aonla juice 6%	16.19	16.32	16.50	16.82	17.03	16.21	16.30	16.51	16.85	16.99	16.20	16.31	16.50	16.84	17.01
T <sub>5</sub> – Guava pulp 98% + Tamarind pulp 2%	16.03	16.16	16.31	16.64	16.80	16.08	16.14	16.34	16.59	16.82	16.05	16.15	16.33	16.62	16.81
T <sub>6</sub> – Guava pulp 96% + Tamarind pulp 4%	16.14	16.26	16.42	16.77	16.90	16.16	16.25	16.43	16.77	16.93	16.15	16.25	16.43	16.77	16.92
T <sub>7</sub> – Guava pulp 94% + Tamarind pulp 6%	16.21	16.34	16.57	16.87	17.07	16.26	16.34	16.58	16.88	17.06	16.23	16.34	16.57	16.87	17.07
T <sub>8</sub> – Guava pulp 98% + Aloe vera pulp 2%	16.02	16.15	16.30	16.58	16.75	15.97	16.14	16.34	16.55	16.79	15.99	16.15	16.32	16.57	16.77
T <sub>9</sub> – Guava pulp 96% + Aloe vera pulp 4%	16.13	16.25	16.41	16.75	16.89	16.16	16.23	16.43	16.74	16.92	16.15	16.24	16.42	16.75	16.91
T <sub>10</sub> – Guava pulp 94% + Aloe vera pulp 6%	16.20	16.33	16.55	16.84	17.05	16.23	16.33	16.54	16.86	17.00	16.21	16.33	16.54	16.85	17.02
T <sub>11</sub> – Guava pulp 98% + Ginger juice 2%	15.97	16.02	16.26	16.45	16.71	15.93	16.05	16.26	16.43	16.75	15.95	16.04	16.26	16.44	16.73
T <sub>12</sub> – Guava pulp 96% + Ginger juice 4%	16.05	16.19	16.35	16.70	16.83	16.12	16.19	16.35	16.65	16.86	16.08	16.19	16.35	16.68	16.85
T <sub>13</sub> – Guava pulp 94% + Ginger juice 6%	16.16	16.28	16.45	16.79	16.95	16.19	16.26	16.47	16.81	16.98	16.18	16.27	16.46	16.80	16.96
T <sub>14</sub> – Guava pulp 98% + Carambola juice 2%	16.04	16.17	16.32	16.69	16.82	16.08	16.15	16.35	16.62	16.85	16.06	16.16	16.34	16.65	16.84
T <sub>15</sub> – Guava pulp 96% + Carambola juice 4%	16.15	16.27	16.43	16.78	16.95	16.18	16.25	16.45	16.80	16.97	16.16	16.26	16.44	16.79	16.96
T <sub>16</sub> – Guava pulp 94% + Carambola juice 6%	16.22	16.36	16.59	16.89	17.10	16.29	16.39	16.62	16.94	17.15	16.25	16.37	16.61	16.91	17.13
T <sub>17</sub> – Guava pulp 98% + Tulsi leaf extract 2%	16.00	16.09	16.28	16.52	16.73	15.95	16.06	16.31	16.50	16.75	15.98	16.08	16.29	16.51	16.74
T <sub>18</sub> – Guava pulp 96% + Tulsi leaf extract 4%	16.11	16.22	16.39	16.73	16.85	16.14	16.20	16.38	16.70	16.90	16.12	16.21	16.39	16.71	16.88
T <sub>19</sub> – Guava pulp 94% + Tulsi leaf extract 6%	16.18	16.30	16.50	16.81	17.02	16.21	16.29	16.49	16.84	16.98	16.20	16.30	16.50	16.83	17.00
T <sub>20</sub> – Guava pulp 98% + Pudina leaf extract 2%	15.99	16.04	16.27	16.48	16.72	15.94	16.06	16.29	16.43	16.75	15.97	16.05	16.28	16.46	16.73
T <sub>21</sub> – Guava pulp 96% + Pudina leaf extract 4%	16.10	16.20	16.36	16.71	16.84	16.12	16.20	16.38	16.67	16.88	16.11	16.20	16.37	16.69	16.86
T <sub>22</sub> – Guava pulp 94% + Pudina leaf extract 6%	16.17	16.29	16.46	16.80	16.99	16.21	16.26	16.48	16.83	16.98	16.19	16.28	16.47	16.82	16.99
SEM ±	0.127	0.010	0.012	0.013	0.016	0.134	0.022	0.032	0.025	0.039	0.092	0.016	0.017	0.014	0.021
CD 5%	NS	0.029	0.034	0.037	0.045	NS	0.062	0.090	0.071	0.112	NS	0.048	0.050	0.041	0.062

**Table 2:** Effect of blended guava nectar with different fruit and medicinal plant extract on reducing sugar (%)

Treatments detail	Reducing sugar (%)														
	I <sup>st</sup> Year					II <sup>nd</sup> Year					Pooled				
	0 DAS	30 DAS	60 DAS	90 DAS	120 DAS	0 DAS	30 DAS	60 DAS	90 DAS	120 DAS	0 DAS	30 DAS	60 DAS	90 DAS	120 DAS
T <sub>1</sub> – Guava pulp 100%	5.90	6.60	6.90	7.55	8.30	5.92	6.56	6.95	7.57	8.33	5.91	6.58	6.93	7.56	8.32
T <sub>2</sub> – Guava pulp 98% + Aonla juice 2%	5.94	6.66	7.06	7.64	8.35	5.95	6.67	7.10	7.66	8.35	5.94	6.67	7.08	7.65	8.35
T <sub>3</sub> – Guava pulp 96% + Aonla juice 4%	6.02	6.78	7.25	7.87	8.42	6.04	6.77	7.27	7.80	8.40	6.03	6.78	7.26	7.84	8.41
T <sub>4</sub> – Guava pulp 94% + Aonla juice 6%	6.12	6.86	7.36	8.05	8.48	6.14	6.88	7.38	8.02	8.47	6.13	6.87	7.37	8.03	8.47
T <sub>5</sub> – Guava pulp 98% + Tamarind pulp 2%	5.96	6.71	7.16	7.70	8.38	5.99	6.68	7.14	7.72	8.36	5.98	6.70	7.15	7.71	8.37
T <sub>6</sub> – Guava pulp 96% + Tamarind pulp 4%	6.05	6.81	7.27	7.90	8.43	6.07	6.79	7.29	7.84	8.44	6.06	6.80	7.28	7.87	8.44
T <sub>7</sub> – Guava pulp 94% + Tamarind pulp 6%	6.14	6.89	7.38	8.07	8.49	6.16	6.90	7.39	8.10	8.51	6.15	6.90	7.39	8.08	8.50
T <sub>8</sub> – Guava pulp 98% + Aloe vera pulp 2%	5.95	6.70	7.13	7.67	8.36	5.95	6.67	7.11	7.66	8.35	5.95	6.68	7.12	7.67	8.36
T <sub>9</sub> – Guava pulp 96% + Aloe vera pulp 4%	6.03	6.79	7.26	7.89	8.43	6.05	6.78	7.28	7.82	8.43	6.04	6.79	7.27	7.85	8.43
T <sub>10</sub> – Guava pulp 94% + Aloe vera pulp 6%	6.13	6.88	7.37	8.06	8.49	6.15	6.89	7.39	8.04	8.49	6.14	6.89	7.38	8.05	8.49
T <sub>11</sub> – Guava pulp 98% + Ginger juice 2%	5.91	6.63	6.97	7.59	8.31	5.93	6.63	6.97	7.57	8.34	5.92	6.63	6.97	7.58	8.32
T <sub>12</sub> – Guava pulp 96% + Ginger juice 4%	5.98	6.74	7.22	7.80	8.39	6.00	6.71	7.22	7.75	8.37	5.99	6.73	7.22	7.78	8.38
T <sub>13</sub> – Guava pulp 94% + Ginger juice 6%	6.09	6.83	7.30	7.94	8.45	6.10	6.81	7.30	7.97	8.46	6.09	6.82	7.30	7.96	8.46
T <sub>14</sub> – Guava pulp 98% + Carambola juice 2%	5.97	6.72	7.18	7.74	8.39	5.99	6.70	7.20	7.72	8.36	5.98	6.71	7.19	7.73	8.37
T <sub>15</sub> – Guava pulp 96% + Carambola juice 4%	6.06	6.82	7.28	7.93	8.44	6.10	6.81	7.30	7.94	8.46	6.08	6.82	7.29	7.94	8.45
T <sub>16</sub> – Guava pulp 94% + Carambola juice 6%	6.15	6.90	7.40	8.10	8.50	6.16	6.93	7.44	8.15	8.55	6.16	6.91	7.42	8.13	8.53
T <sub>17</sub> – Guava pulp 98% + Tulsi leaf extract 2%	5.93	6.65	7.05	7.63	8.34	5.93	6.66	7.09	7.65	8.35	5.93	6.66	7.07	7.64	8.34
T <sub>18</sub> – Guava pulp 96% + Tulsi leaf extract 4%	6.00	6.77	7.24	7.84	8.41	6.02	6.75	7.26	7.79	8.40	6.01	6.76	7.25	7.82	8.41
T <sub>19</sub> – Guava pulp 94% + Tulsi leaf extract 6%	6.11	6.85	7.34	8.02	8.47	6.11	6.83	7.33	7.99	8.47	6.11	6.84	7.34	8.00	8.47
T <sub>20</sub> – Guava pulp 98% + Pudina leaf extract 2%	5.92	6.64	6.99	7.62	8.32	5.93	6.65	6.99	7.58	8.34	5.93	6.65	6.99	7.60	8.33
T <sub>21</sub> – Guava pulp 96% + Pudina leaf extract 4%	5.99	6.76	7.23	7.81	8.40	6.00	6.73	7.24	7.76	8.39	5.99	6.75	7.24	7.78	8.40
T <sub>22</sub> – Guava pulp 94% + Pudina leaf extract 6%	6.10	6.84	7.32	7.96	8.46	6.10	6.83	7.32	7.97	8.47	6.10	6.84	7.32	7.97	8.47
SEM ±	0.121	0.017	0.019	0.028	0.009	0.125	0.030	0.030	0.053	0.029	0.087	0.017	0.018	0.030	0.015
CD 5%	NS	0.049	0.054	0.080	0.026	NS	0.086	0.084	0.150	0.082	NS	0.051	0.052	0.088	0.045

## Conclusion

Result concluded that the treatments consisting of different edible fruit pulp and juice of aonla juice, tamarind pulp, *Aloe vera* pulp, ginger juice, carambola juice, tulsi leaf extract and pudina leaf extract were statistically influenced the chemical composition and sensory parameters of

blended guava nectar. It was observed that the treatment T<sub>16</sub> – Guava pulp 94% + Carambola juice 6% was found the best treatment for preparation of blended guava nectar as compared to rest of treatments and it was also recorded the maximum total sugar (%), reducing sugar (%) and non-reducing sugar (%) in blended guava nectar.

## References

1. Ahirrao PP, Relekar PP, Kadam SK. Development of Carambola (*Averrhoa carambola* L.)- pineapple (*Ananas comosus* L.) blended jelly cubes. The Pharma Innovation Journal. 2022;11(9):1104-1109.
2. Anonymous. Final Area and Production Estimates for Horticulture Crops for 2020-21. National Horticulture Board, Gurgaon. 2021-22. Available from: <http://www.nhb.gov.in>.
3. Bhadouriya P, Gurjar PKS, Rajput P, Rathour SS, Burma B. Bio-chemical evaluation and workout the economics of guava nectar. International Journal of Agricultural Sciences. 2022;18(1):432-439.
4. Bogha TT, Sawate AR, Kshirsagar RB, Agarkar BS, Patil BM. Studies on development and organoleptic evaluation of blended guava-pineapple jelly incorporated with *Aloe vera*. Journal of Pharmacognosy and Phytochemistry. 2020;9(1):1969-1972.
5. Gaikwad SB, Patil RA, Deokar SN, Wable SD. Studies on preparation of guava nectar blended with *Anola* and *Tulsi* extract. The Pharma Innovation Journal. 2022;11(12):5763-5772.
6. Hayes WB. Fruit Growing in India. Allahabad: Kitabistan; 1970.
7. Jain ML, Broker DH. Preservation and storage stability of ready-to-serve beverage from guava (*Psidium guajava* L.). Indian Food Packer. 1970;24:29.
8. Kaushal N, Singh G, Kachwaya DS, Singh A. Process Optimization and Preparation of Guava Nectar Blended with *Aloe vera*. International Journal of Applied Research And Technology. 2019. ISSN 2519-5115.
9. Khan RU, Ayub M. Effect of different chemical preservatives on the quality attributes of guava *Aloe vera* blended pulp at ambient conditions. Sarhad Journal of Agriculture. 2020;36(2):411-418.
10. Lavanya T, Raj D, Vaghashiya JM. Standardization of formulation for preparation of health drink by blending *Aloe vera*, guava and jamun. International Journal of Chemical Studies. 2018;6(4):1715-1721.
11. Mehta V, Delvadia DV, Galav A, Sharma AK. Standardization of processing technology for blended guava (*Psidium guajava* L.) cv. Lucknow-49 Ready-To-Serve beverage. International Journal of Advanced Scientific Research and Management. 2018;1(2):184-187.
12. Sangani SL, Raj D, Timur A, Tank RV, Desai CS. Effect of blending levels, fiber concentration and storage period on sensory quality of carambola-guava blended pre-biotic nectar. The Pharma Innovation Journal. 2021;10(6):1244-1249.
13. Verma AK, Deen BN, Bharty SK, Patel B, Yadav U. Studies on development of syrup blending with guava (*Psidium guajava* L.), woodapple (*Feronia limonia* L.) and ginger (*Zingiber officinale* Rosc.). African Journal of Biological Sciences. 2024;6(14).
14. Vikram B, Sikarwar PS. Studies on preparation of value-added herbal kinnow-aonla beverages (RTS and squash) during storage. International Journal of Pure and Applied Bioscience. 2018;6(1):758-765.