The Pharma Innovation Journal 2021; SP-10(12): 1078-1082

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; SP-10(12): 1078-1082

www.thepharmajournal.com
Received: 04-10-2021
Accepted: 06-11-2021

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Study the quality of therapeutic RTS beverage developed from aonla basil and ginger

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Abstract
The RTS beverage using Aonla, ginger with different concentration of basil juice (T_1 5%, T_2 7%, T_3 7%, T_4 9%, T_5 11%) was developed. The effect of basil juice on RTS organoleptic quality was determined by analysing Taste, colour, flavour, and overall acceptability of RTS beverage. The result suggested that due to addition of basil juice to RTS beverage taste, colour, flavour, and overall acceptability was high compared to RTS adding basil juice. High acceptability in sensory aspects was observed in RTS beverage sample T_4 on hedonic scale test carried out by the 10 members of semi trained panel and score were given by evaluating the various sensory aspects.it was found that sample T_4 which has prepared using 9% basil juice showed best result. The highest valve of TSS was found that sample T_0 (14.9°C Brix) and highest Vitamin C content was observed in sample T_4 (91.8mg/250ml) The ascorbic acid was observed to be with increasing with the amount of basil juice. highest valve of Acidity was found in sample T_0 (0.308%) and highest valve of pH was found in sample T_0 (4.1) and pH of the RTS beverage decreased progressively during storage period.

Keywords: Aonla juice, basil juice, ginger juice, RTS beverage

Introduction
Ready-to-serve (RTS) beverages made up of fruit pulp have greater amount of water that is useful for body balancing by preventing dehydration. Fruit drinks contain high percentage of sugar and provide a few vitamins and minerals. (Sulochanamma *et al*., 2018) [14].
Aonla or Indian gooseberry (*Emblica officinalis*) is the fruit of deciduous tree found mainly in India. The fruit of this plant is round shaped with vertical stripes. It is greenish yellow in colour and tastes sour. The fruit is fibrous in nature. It is also known as Indian Gooseberry and has both nutritive and medicinal properties. It is very rich in Vitamin – C (500-1500 mg of ascorbic acid per 100g) (Chauhan *et al*., 2005). Aonla possesses the highest level of heat and storage-stable vitamin C known to man. Pectin and minerals like iron, calcium and phosphorus are also found abundantly in the fruit. It is a very powerful anti-inflammatory herb. Aonla is the richest source of natural vitamin C. It provides up to 900 mg/100 g of juice of the fresh fruit. It has the same amount of ascorbic acid or vitamin C present in two oranges. Due to high vitamin C content Aonla has anti oxidative properties. Aonla also has carminative properties. It helps in maintaining a healthy digestive system.
Tulsi is a popular home remedy for many ailments such as wound, bronchitis, liver diseases, catarrhal fever, otalgia, lumbago, hiccough, ophthalmic, gastric disorders, genitourinary disorders, skin diseases, various forms of poisoning and psychosomatic stress disorders (Das *et al*., 2006; Prajapati *et al*., 2003) [3, 8]. It has also aromatic, stomachic, carminative, demulcent, diaphoretic, diuretic, expectorant, alexiteric, vermifuge and febrifuge properties. The Tulsi leave extracts with methanol, water, and acetone were used to monitor the anti-bacterial property against clinically isolated MDR bacterial strains (Staples, George; Michael S. Kristiansen, 1999) [13].
Ginger (*Zingiber officimale* Rosc.) is valued as a spice for ages and is also known for its medicinal properties such as to treat in rheumatoid arthritis, ulcer, preventing heart attack and stroke. Ginger is an aromatic tuber crop having volatile oils that account for the aroma of the tubers (Kikuzaki *et al*., 1971). Not only this, the use of ginger as antiviral, anti-cancer and anti-ulcerogenic drug has been widely accepted. Ginger, a source of valuable phytonutrients is characterized by an aromatic odour and a pungent taste. The part of the ginger plant that is used, is the root, which is botanically the rhizome.

Materials and Method

Preparation of Aonla juice

Fresh, fully ripe, sound Aonla were used for extraction of juice. Each fruit was cleaned, thoroughly washed, blanched and blended in a laboratory blender to a pulp and the juice was extracted by filtering through muslin cloth and stored refrigerated temperature.

Preparation of Basil leaves juice

The fresh basil leaves were selected by visual appearance on the basis of colour (Greenish) and for no physical damage on the surface or spoilage. Collected basil leaves were washed by pure water to remove the dust particles. Grind of the basil leaves was done by the grinder to obtain Basil juice. Grinded basil Juice were filtered by muslin cloth to extract clear juice.

Preparation of Ginger juice

The fresh and mature ginger were selected on the basis of colour by visual appearance and without any physical damage on the surface. Then the collected ginger was washed by pure water for removing of the dust Then peeling and cutting was carried out. Cut pieces of ginger were passed through mixer with addition of water. The pulp was passed through muslin cloth to get clear ginger juice.

Preparation of Aonla, Basil and ginger juice therapeutic RTS Beverage

The Therapeutic RTS was prepared with different proportions of Aonla juice, basil juice and Ginger Juice. All the prepared ingredients were mixed properly to form the mixture of Therapeutic RTS.

T_0 – 10% Aonla juice + 1% Ginger juice + control Basil juice
T_1 – 10% Aonla juice + 1% Ginger juice + 3% Basil juice
T_2 – 10% Aonla juice + 1% Ginger juice + 5% Basil juice
T_3 – 10% Aonla juice + 1% Ginger juice + 7% Basil juice
T_4 – 10% Aonla juice + 1% Ginger juice + 9% Basil juice
T_5 – 10% Aonla juice + 1% Ginger juice + 11% Basil juice

Preparation of RTS beverage

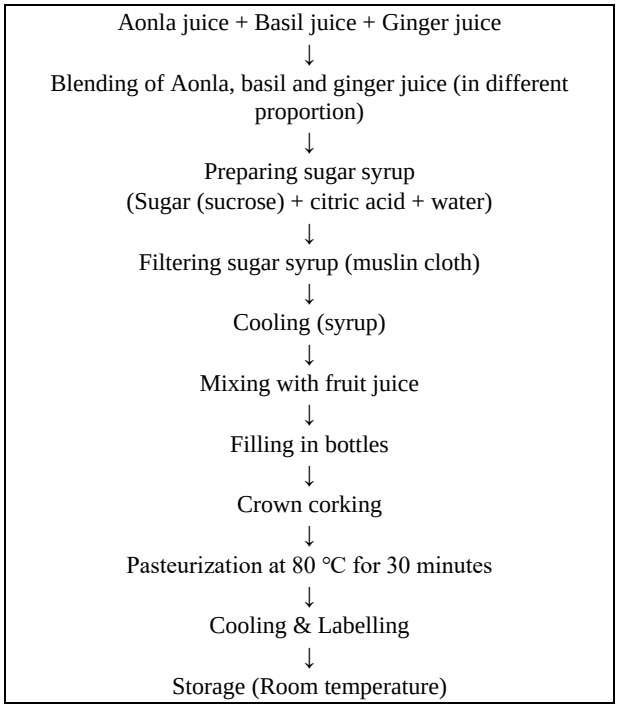


Fig 1: Flow Chart for Preparation of RTS beverage

Chemical Analysis of Aonla, Basil and Ginger RTS Beverage

The content of total soluble solids (TSS) in cactus fruit pulp and RTS beverage was determined with the help of refractometer. AOAC (1998). Titratable acidity as tartaric acid was determined according to the method of AOAC, (2000) [1]. The pH was determined with the help of a digital pH meter AOAC (1985). Ascorbic acid was determined by the titration method using 2, 6-diclorophenol dye as recommended by (Ranganna 2001) [9].

Sensory evaluation of prepared RTS

Sensory evaluation was made through panel of 10 semi-trained judges. he panels evaluated the acceptance level of beverage for color, flavor, taste and overall acceptability. 9-point hedonic scale was used for this purpose. Islam *et al.*, (2014) [6]

Result and Discussion

This research has clearly indicated the overall quality and acceptance of RTS Beverage. Study on physico-chemical parameter and sensory attributes are presented with graphical representation in this chapter. Graphs have been prepared for each parameter. The results were reported under following heads.

Physico-chemical characteristics of raw materials

Physical Characteristics of Aonla fruit

The physical properties of Aonla were measure the length and breadth, length and breadth by using vernier caliper. Ten randomly selected Aonla from lot were selected and individually weighed on electronic 4 digit weighing balance. Physical features of fresh Aonla were characterized by their colour, shape, length, breadth, fruit weight and, etc. All these characteristics were studied and average values are reported. The results are more or less similar with results given by Raut *et al.*, (2016)

Table 1: Physical Characteristics of Aonla

Parameters	Aonla
Colour	Light green with yellowish
Shape	Oval
Breadth(mm)	3.2
Length(mm)	3.19
Fruit Weight(g)	26.12

* Each Value represents the average of three determinations.

Physical Characteristics of Basil leaves

The physical properties of basil were measured by Vernier calliper Physical features of fresh mint were characterized by their colour, shape, breadth, length, fruit weight, etc tabulated in table 2. All these characteristics were studied and average values are reported.

Table 2: Physical Characteristics of Basil

Parameter	Basil
Colour	Greenish
Shape	Oval pointed and sharp
Breadth(cm)	2.8
Length(cm)	2
Leaf Weight(g)	1.25

* Each Value represents the average of three determinations

Physical Characteristics of Ginger

The physical properties of ginger were measured by Vernier calliper. Physical features of Ginger were characterized by their colour, shape, breadth, length, fruit weight, etc tabulated in table 3. All these characteristics were studied and average values are reported. These results were found similar with results reported by Sasikumar *et al.*, (2013) [12].

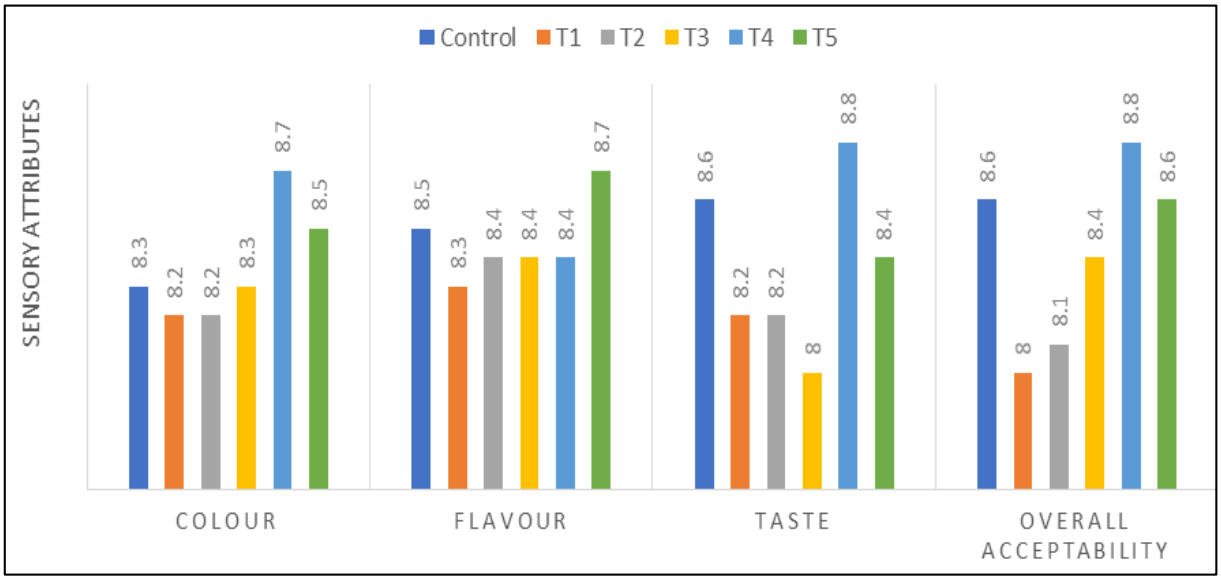
Table 3: Physical Characteristics of Ginger

Parameter	Ginger
Colour	Light brown to dark brown
Shape	Longitudinal
Breadth(inch)	2.8
Length(inch)	4.1
fruits Weight(g)	34.8

* Each Value represents the average of three determinations

Sensory evaluation of RTS beverage by using different level of basil juice

The sensory evaluation RTS beverage with addition of basil juice in varying proportions was carried out by the ten members of semi trained panel and the score were given by evaluating the various sensory aspects i.e., colour, flavour, taste and overall acceptability which were compared with control sample and in graph 1.



Graph 1: Colour, flavour, taste and overall acceptability which were compared with control sample

Chemical Analysis of Therapeutic RTS

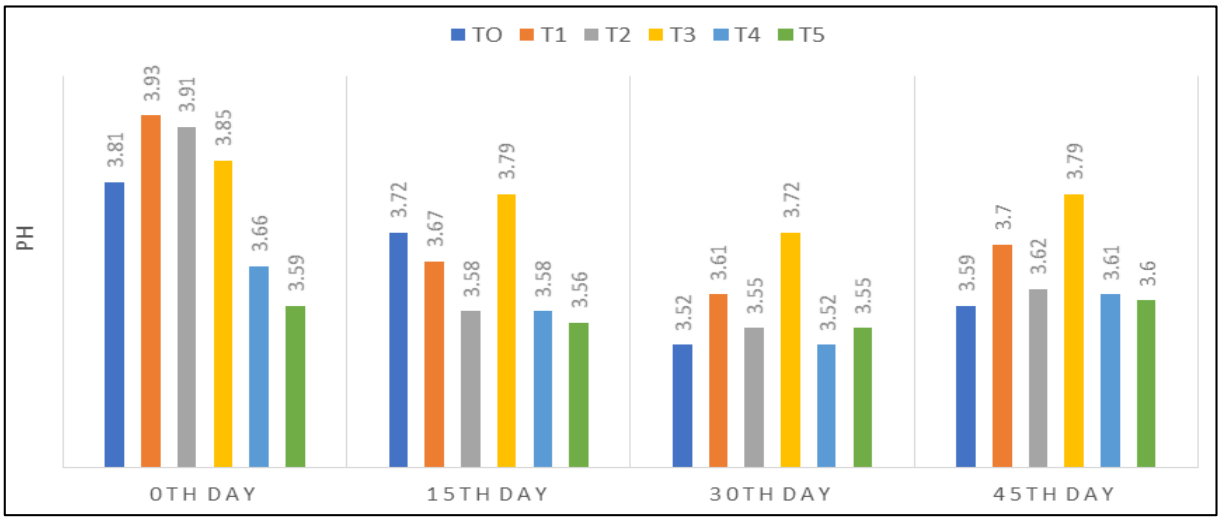
The result of chemical analysis of Therapeutic RTS such as TSS, acidity and pH were evaluated and the results obtained are tabulated in table 4

Table 4: Chemical Analysis of Therapeutic RTS

Treatment	TSS (℃ Brix)	pH	Acidity (%)	Ascorbic acid (mg/250ml)
Control	14.9	4.1	0.308	93.7
T1	12	3.72	0.28	87.6
T2	12.5	3.66	0.26	88.7
T3	14.6	3.78	0.24	90.7
T4	13.4	3.81	0.25	91.8
T5	13	3.78	0.29	90.4

Chemical analysis develops RTS beverage during storage pH

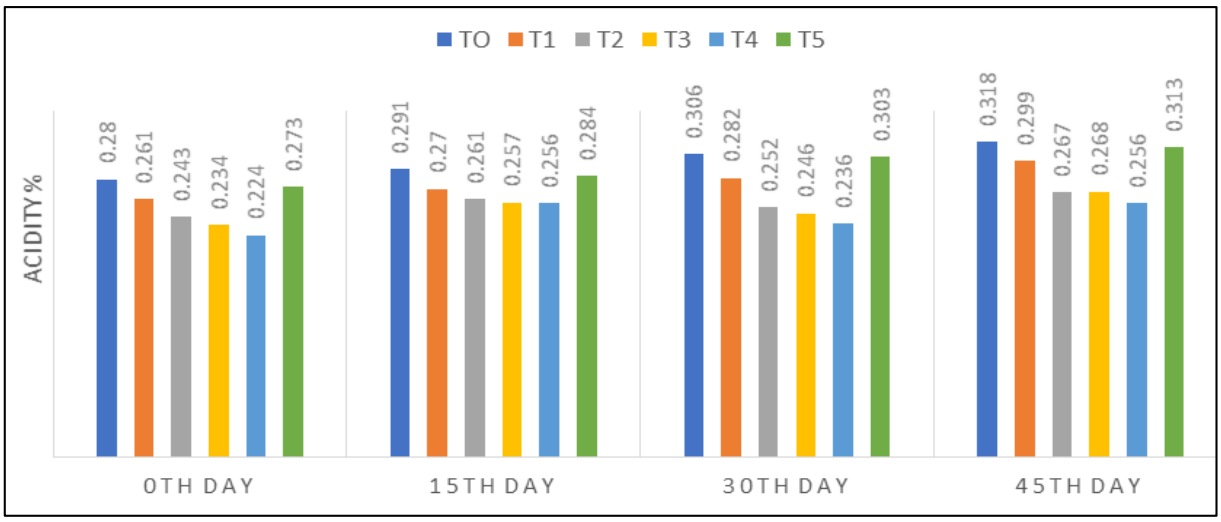
It was observed that with the pH. of the RTS beverage kept on decreasing. T_3 always had the highest pH (graph 2). Similar result was found by Dhaliwal and Hira (2001) [4]



Graph 2: Chemical analysis develops RTS beverage during storage pH

Titratable Acidity

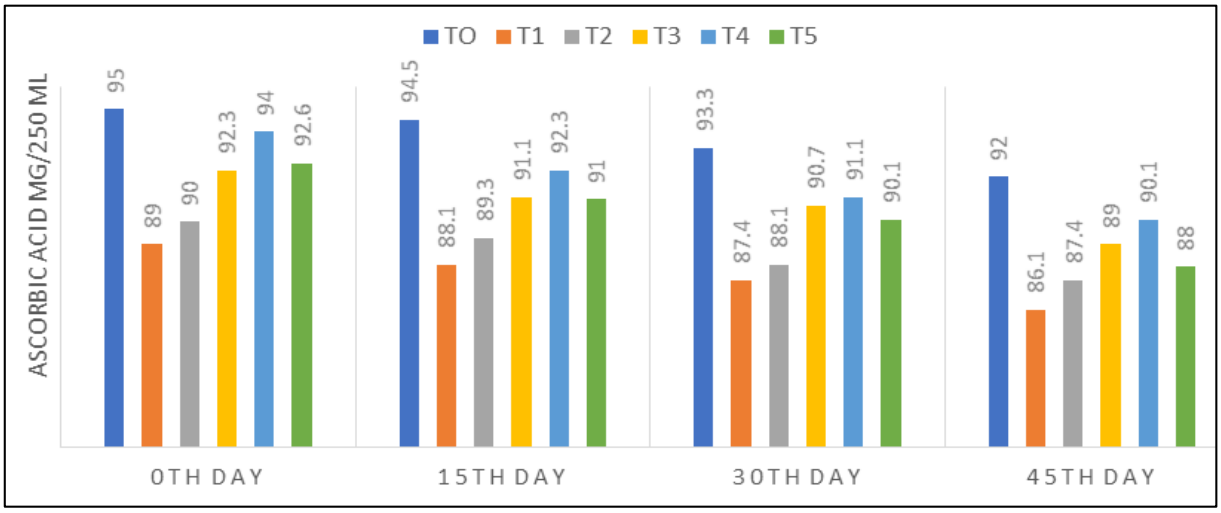
It was observed that with time, the titratable acidity of the RTS Beverage kept on increasing.it is because pH. and titratable acidity are said to the inverse relation to each other. T_5 was observed to have the highest titratable acidity see the graph 3. observation was recorded by Islam *et al.*, (2014) [6]



Graph 3: Titratable Acidity

Ascorbic acid

The change in Vitamin c content with storage in given graph 4. The vitamin content increased with every passing two week see the table 8. The decreasing phenomenon was observed in ascorbic acid content similar results was recorded by Sasikumar and Vivek (2015) [11].



Graph 4: Ascorbic acid

Conclusion

The study was for development of the RTS beverage using Aonla juice, ginger juice with different concentration of basil juice. The effect of basil juice on RTS beverage was determined by analysing sensory attributes of RTS beverage. The RTS beverage stored at for 45 days had analysed as shows sensory quality. The organoleptic quality was determined by analysing Taste, Colour, Flavour and overall acceptability of RTS beverage. It was concluded that the treatment T_4 Aonla juice: ginger juice: basil juice) (10:1:9) were found to be most effective RTS beverage for minimum changes pH (3.66 to 3.61), Ascorbic acid (94 to 90.1 mg/250ml) and can be stored up to 45 days, most all RTS beverage had almost equally good sensory characteristics. On the basis of above results revealed in the present study it may be concluded that the formation of mixed juice RTS beverage is possible to satisfy consumer taste and preferences along with imparting health benefits.

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