

Original Research Article

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## Standardization of Recipe for Preparation of Beverage RTS of Dragon Fruit

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### ABSTRACT

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The current investigatory work entitled “Studies on Standardization of recipe for preparation of beverages (RTS of dragon fruit)” was executed at Pomology Laboratory, Department of Pomology, Pt K.L.S. CHRS, Pendri, Rajnandgaon, IGKV, Raipur, Chhattisgarh during year 2019-2020. The research was performed on sensory analysis of RTS of dragon fruit at fortnight meantime for course of 45 days preservation by implementing CRD with 3 replication inside lab condition. Each replication comprised of 7 treatments for RTS. It comprise of 10 percent pulp and 0.3 percent acidity and recipe is varied by different concentration of TSS which are as follows for T1 (9 percent TSS), T2 (10 percent TSS), T3 (11 percent TSS), T4 (12 percent TSS), T5 (13 percent TSS), T6 (14 percent TSS), T7 (15 percent TSS). The RTS with treatment T7 comprising of 10% pulp, 0.3% acidity and 15% TSS got peak score on colour, flavour, taste, appearance and overall acceptability among various recipe implemented. The organoleptic score in case of RTS was peak for T7 containing 10 % pulp, 0.3 % acidity and 15 % TSS while least for treatment T1 containing 10 percent pulp, 0.3 percent acidity, 9 percent.

### Introduction

Dragon fruit (*Hylocereus spp.*) is a sweltering climate bearer climbing cactus. The genus *Hylocereus* belongs to Cactaceae family, which is a dicotyledonous flowering plant family, under Caryophyllales order. In Latin America it is also known belle of the night and condrella plant. It is very attractive due to its unique and eye catching appearance. It derived its origin from the tropical and subtropical regions of Latin Americas, including

North, Central and South America (Crane and Balerdi 2005; Luders and McMahon, 2006). This is grouped among as non- apocalyptic Fruit. The weight of fruit is 150-1200 g and varies in size and shape of the fruit, as well as the colour of pulps i.e. red (*H. polyrhizus*) or white (*H. undatus*).

Dragon fruit mean weight is around 350 g. It has luscious pulp carrying plenty of tiny black seeds. It is also known for its rich anitioxidant and micronutrient property. It contains antioxidant such

as flavanoids, phenolic acid and betacyanin and naturally fat free and high fibre. These is a low acid food and Its pH values ranges between 4.4 and 5.1 out of which malic acid forms major portion. Biochemical estimation of fruit showed that the 100 gm fruit has moisture content of about 83-88%, titratable acidity between 0.20 to 0.30 mg lactic acid equivalents, total soluble solids (TSS) between 8-12°Brix

Dragon fruit is pool of enomourous nutrients. It basically contains various nutrients in significant amount such as K, P, Na, Ca and Mg whereas vitamins such as ascorbic acid (33 mg/100 g) and niacin (0.2-2.8 mg/100 g) at high quantity while small quantity of thiamine, riboflavin and retinol are also available in it (< 0.05 mg/100 g) (Stintzing *et al.*, 2003). In 100 gram of fruit it contains 60 gm calories, 1.2 gm protein, 0 gm fat 13 gm carbs, 3gm fibre, 3% of the RDI ascorbic acid, 4% of the RDI Fe, 10% of the RDI Mg. Fruit seeds composed of tocopherol and fatty acids (Tarpila *et al.*, 2005).

It composed of aqua dissolvable phytochemical pigment betacyanin, mostly present in the flesh of red variety and also can be present in the peel of both red and white variety. These fruit have plenty of medicinal advantages which includes to let down cholesterol concentration, to stabilize blood sugar concentration, to fend off colon cancer, to shore up urinary function and bone, to crank up the brain workings, to mount up the sharpness of the eyes, to fend off memory loss, inhibits oxidation and recovery of wounds etc. Apart from this it has potentiality to advance the increase of probiotics in intestinal tract (Zainoldin and Baba, 2009). The dragon fruit assist in the digestion process, because it counteracts venomous substances such as heavy metal, and its habitual usage fend off asthma and cough.

Dragon fruit can be consumed fresh. Its flowers can be consumed directly or macerated in tea. Rarely utilized in flavouring other drinks. The pulpy and luscious flesh can also be jumbled with milk or sugar, utilized in marmalades, jellies, ices and soft

drinks. It can also be transformed into juice, jam, RTS, nectar, squash, red wine, etc. Beside it can be useful to develop factory products such as preserve, ice cream, syrup, yogurt, candy, pastry, spread and ketch up.(Anonymous, 2006). Rarely pulp jumbled in pizzas. Processed products can be made from fresh pulp or frozen pulp.

The red and pink pulp of dragon fruit can be used as a food dyeing agent and as a raw material for the food dyeing factories (Wybraniec and Mizrahi, 2002). The flower buds are utilized to make soups or jumbled in salads, and could also be consumed as a vegetable. The peels can be parched to separate pectin and antioxidants. The utilization of red pitaya as a raw material makes the food attractive and eye catching and also add up to nutritional composition of its processed products.

## **Materials and Methods**

The recent research on Standardization of recipe for preparation of beverages RTS of dragon fruit was conducted during 2019-20 in the laboratory of Department of fruit science, Pt K.L.S College of Horticulture and Research Station Rajnandgaon (C.G). It is located at 21.10°N latitude, and 81.03°E longitude and at an altitude of 307 m MSL under Chhattisgarh plains. It has tropical and dry spell throughout the year.

However the temperature observed is 10°C during winter and in summer reaches the 48°C. This place bears hot windy climate during summer and precipitation annually of 1250 mm out of which approximately 85% is precipitated from third week of june to mid of September and remaining precipitate in month of October to February. May month has maximum temperature while December month has minimum temperature.

The basic material used in this present research are firm, well developed and uniform ripened dragon fruit of *Hylocerus costaricensis* species which were obtained from farm of Chawda Bagh, Nandanvan Road, Raipur. The other materials such as sugar and

citric acid were purchased from Rajnandgaon local market and chemical and solution needed for analysis were provided by Fruit Science Processing laboratory, Pt. K.L.S College of Horticulture and Research Station Rajnandgaon C.G and Soil Science laboratory, S.K.S College of Agriculture and Research Station, Rajnandgaon C.G.

The experiment was laid on Completely Randomized Design (CRD). It consist of 7 treatment and 3 replication in which T1(Pulp 10% + TSS 9 % + Acidity 0.3 %), T2(Pulp 10 % + TSS 10% + Acidity 0.3 %), T3 (Pulp 10% + TSS 11% + Acidity 0.3 %), T4(Pulp 10% + TSS 12 % + Acidity 0.3 %), T5(Pulp 10% + TSS 13% + Acidity 0.3 %), T6(Pulp 10% + TSS 14% + Acidity 0.3 %), T7(Pulp 10% + TSS 15% + Acidity 0.3 %). Evenly ripen well matured fruits were chosen for making of dragon fruit for RTS beverage.

Fruits chosen are cleaned with tap water free from dirt and unwanted materials. Dragon fruit are cut into two halves and then its peels are removed and pulp along with seeds are separated from peel then pulp is grinded into fine substance using hand grinder. After pulp separation, 20 percent pulp were taken for RTS.

The end product concentration was balanced by adding required amount of water in one and all replication. Calculated quantity of sugar is mixed in the pulp to maintain its TSS and acidity in the final product are maintained 0.3% by adding required amount of citric acid. Product are poured into hot, disinfected bottles of 200 ml capacity bottles and sealed completely.

Pasteurization of sealed bottles was done in boiling water for 10 minutes. The bottles of RTS beverages were stored under favourable environment for further analysis and observation upto 45 days.

The RTS beverage prepared from dragon fruit were assigned to organoleptic examination by group of judges following the nine point hedonic rating test as described by Ranganna (1977). The features with

average score of 5 or more out of 9 marks were considered acceptable.

The overall acceptability of product was based upon the mean scores obtained from all the features studied under the analysis. The average scores obtained by different products were calculated. Critical difference point at P=0.05 were used to calculate mean difference of treatments.

## **Results and Discussion**

A panel of well trained ten judges carried out the organoleptic evaluation of dragon fruit RTS made from various recipes. The sensory grades are illustrated in Table 1 and displayed in fig.1.

The various treatment as recipes noted organoleptic grades between 5.58 to 9.00. The peak grade was assigned to recipe T<sub>7</sub> (8.00) with rating 'like very much'. Among all the recipes prepared least score was obtained by T<sub>1</sub> (6.00). The recipe T<sub>7</sub> not only obtained peak grade in overall acceptability but also recorded peak grade in colour (9.01), flavour (8.03), appearance (8.02) and taste (8.02) as compared to other recipes.

These seven recipes of RTS varied in their TSS concentration and rest of things such as pulp percentage and acidity percentage are similar in all seven recipes. The recipe T<sub>7</sub> contains 15 % TSS, 0.3% acidity and pulp 10%. The result recorded showed that the judges like dragon fruit RTS with 15% TSS. Similar results was obtained by Bayanna and Gowda (2012) for sweet orange RTS and Nilugin *et al.*, (2010) for palmyrah RTS.

Organoleptic evaluation of RTS of dragon fruit which was stored under ambient environment conditions was carried out at fortnight meantime by the group of 10 trained judges. Data related to difference in colour, flavour, appearance, taste and overall acceptability score of RTS of dragon fruit during storage for 45 days under room temperature storage conditions.

At 0,15,30 and 45 days at the fortnight meantime, the average grade of color, aroma, taste, appearance and overall acceptability of various treatment was noted and observed that the color, aroma, taste, appearance and overall acceptability of dragon fruit RTS with distinct treatment continuously declined with passage of time for 45 days.

At the time of RTS preparation that is at 0 day, highest average score of colour, flavour, taste, appearance and overall acceptability were noted 9.01, 8.03, 8.02, 8.02 and 8.00 respectively of treatment T<sub>7</sub> and least score of colour, flavour, taste, appearance and overall acceptability were noted 5.58 (T<sub>1</sub>), 5.98 (T<sub>5</sub>), 5.98(T<sub>1</sub>), 6.02 (T<sub>1</sub>) and 6.00 (T<sub>1</sub>) respectively.

After 15 days storage, highest average score of colour, flavour, taste, appearance and overall acceptability were noted 8.97, 8.00, 7.96, 7.97 and 7.98 respectively of treatment T<sub>7</sub> and least score of colour, flavour, taste, appearance and overall acceptability were noted 5.48 (T<sub>1</sub>), 5.95 (T<sub>2</sub>), 5.95(T<sub>1</sub>), 5.97 (T<sub>1</sub>) and 5.96 (T<sub>1</sub>) respectively. After 30 days storage, highest average score of colour, flavour, taste, appearance and overall acceptability

were noted 8.97, 7.94, 7.93, 7.93 and 7.94 respectively of treatment T<sub>7</sub> and least score of colour, flavour, taste, appearance and overall acceptability were noted 5.45 (T<sub>1</sub>), 5.94 (T<sub>2</sub>), 5.92 (T<sub>1</sub>), 5.92 (T<sub>1</sub>) and 5.93 (T<sub>1</sub>) respectively.

After 45 days storage, highest average score of colour, flavour, taste, appearance and overall acceptability were noted 8.94, 7.90, 7.90, 7.91 and 7.90 respectively of treatment T<sub>7</sub> and least score of colour, flavour, taste, appearance and overall acceptability were noted 5.42 (T<sub>1</sub>), 5.90 (T<sub>2</sub>), 5.89 (T<sub>1</sub>), 5.89(T<sub>1</sub>) and 5.90 (T<sub>1</sub>) respectively.

The organoleptic score below 6 shows that product is not good for use. The RTS had a slight decline in organoleptic quality in course of preservation period at room temperature.

The organoleptic score in case of RTS was peak for T<sub>7</sub> containing 10 % pulp, 0.3 % acidity and 15 % TSS while least for treatment T<sub>1</sub> containing 10 percent pulp, 0.3 percent acidity, 9 percent TSS. The recipe containing 10% pulp, 0.3% acidity and 15% TSS was found suitable for preparation of dragon fruit RTS.

**Table.1** Organoleptic score of RTS during recipe standardization

S. no	Treatment	Colour	Flavour	Taste	Appearance	Overall acceptability	Rating
1	T <sub>1</sub> (10%pulp +9% TSS +0.3% acidity)	5.58	7.00	5.98	6.02	6.00	Like slightly
2	T <sub>2</sub> (10% pulp +10% TSS +0.3% acidity)	5.75	6.00	7.98	8.01	6.03	Like slightly
3	T <sub>3</sub> (10%pulp TSS +0.3% acidity)	5.91	6.04	6.98	7.02	6.04	Like slightly
4	T <sub>4</sub> (10%pulp12% TSS +0.3% acidity)	7.02	7.02	8.01	8.01	6.51	Like slightly
5	T <sub>5</sub> (10%pulp13% TSS +0.3% acidity)	8.02	5.98	7.02	7.02	6.26	Like slightly
6	T <sub>6</sub> (10%pulp14% TSS +0.3% acidity)	8.04	6.68	7.06	7.04	7.00	Like moderately
7	T <sub>7</sub> (10%pulp+15% TSS +0.3% acidity)	<b>9.00</b>	<b>8.03</b>	<b>8.02</b>	<b>8.02</b>	<b>8.00</b>	<b>Like very much</b>

**Fig.1** Organoleptic Analysis of Dragon Fruit RTS Beverage



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