

Original Research Article

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Standardization of Recipe for Preparation of Beverage Nectar from Dragon Fruit

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ABSTRACT

The current investigatory work entitled “Studies on Standardization of recipe for preparation of beverages Nectar 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 Nectar 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 Nectar. The nectar comprise of 20 percent pulp and 0.3 percent acidity and recipe is varied by different concentration of TSS which are as follows for T₁ (16%TSS), T₂ (17 % TSS), T₃ (18 % TSS), T₄ (19 %t TSS), T₅ (20 % TSS), T₆ (21%TSS), T₇ (22 % TSS).Nectar with treatment T₇ comprising of 20% pulp, 0.3% acidity and 22% TSS got peak score on colour, flavour, taste, appearance and overall acceptability among various recipe implemented. While it also obtained peak score in TSS, ascorbic acid, TSS Acid ratio, TS and RS is peak, while acidity and NR sugar was least for treatment T₇ comprising of 20% pulp, 0.3% acidity and 22% TSS. NR sugar, and acidity got peak score in case of treatment T₁ comprising of 20% pulp, 0.3% acidity and 16% TSS. The organoleptic score, pH, NR sugar and TSS acid ratio shows diminishing pattern whereas TSS, acidity, ascorbic acid, TS and RS shows rising pattern.

Keywords

Nectar, TSS, Organoleptic, climbing cactus, enomourous nutrients

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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. 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; To *et al.*, 1999). 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. In today's modern society mostly food items are available in processed form. Due to advancement there is need of instant served food products in breakfast, lunch and dinner.

Therefore demand of processed items have been increased. Among all types of processed items available, fruit originated processed products considered as crucial in daily diet of human beings. To provide nourishing, secure, beneficiary and consumable food to consumers all around the year is one of main preference of food processing.

This fruit is new to Chhattisgarh and is cultivated in some parts of Raigarh district (kotra, Kharsia) Raipur, Rajnandgaon and Durg district. And there are rare work done in dragon fruit in India especially in processing. As hot climate and low rainfall is suitable for its cultivation so its area and production will increase in Chhattisgarh in future so there is need to standardize the recipe for preparation of useful products from it such as jam, jelly and beverages.

Materials and Methods

The recent research on Standardization of recipe for preparation of beverages (Nectar) 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 20% + TSS 16% + Acidity 0.3 %), T2(Pulp 20% + TSS 17% + Acidity 0.3 %), T3 (Pulp 20% + TSS 18% + Acidity 0.3 %), T4(Pulp 20% + TSS 19% + Acidity 0.3 %), T5(Pulp20% + TSS 20% + Acidity 0.3 %), T6(Pulp 20% + TSS 21% + Acidity 0.3 %), T7(Pulp 20% + TSS 22% + Acidity 0.3 %). Evenly ripen well matured fruits were chosen for making of dragon fruit for Nectar 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 is separated from peel then pulp is grinded into fine substance using hand grinder. After pulp separation, 20 percent pulps were taken for Nectar making respectively. 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 Nectar beverages were stored under favorable environment for further analysis and observation up to 45 days.

The nectar 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 Nectar made from different recipes. The organoleptic scores are presented in Table 1. The different treatment as recipes recorded organoleptic score between 5.97 to 8.96.

The highest score was assigned to recipe T7 (7.9) with rating 'like moderately'. Among all the recipes prepared least score was obtained by T1 (6.14). The recipe T7 not only obtained highest score in overall acceptability but also recorded highest score in colour (8.9), flavor (8.02), appearance (7.02) and taste (8.02) as compared to other recipes.

These seven recipes of Nectar varied in their TSS concentration and rest of things such as pulp percentage and acidity percentage are similar in all seven recipes. The recipe T7 contains 22 % TSS, 0.3% acidity and pulp 20%. The result recorded

showed that the judges like dragon fruit Nectar with 22 % TSS. Organoleptic assessment of Nectar of dragon fruit which was preserved under room temperature environment conditions was carried out at fortnight meantime by the group of 10 trained judges.

Data related to variation in colour, flavour, appearance, taste and overall acceptability grade of RTS of dragon fruit in time of storage for 45 days under room temperature preservation conditions are represented in Table 4.3.2.1, 4.3.2.2, 4.3.2.3, 4.3.2.4 and 4.3.2.5 respectively.

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 nectar with distinct treatment continuously declined with passage of time for 45 days.

At the time of Nectar preparation that is at 0 day, highest average score of colour, flavour, taste, appearance and overall acceptability were noted 8.96, 8.02, 8.02, 7.02 and 8.27 respectively of treatment T7 and least score of colour, flavour, taste, appearance and overall acceptability were noted 6.02 (T1), 5.97 (T5, T1), 5.97 (T2), 5.98 (T3) and 6.14 (T1) respectively.

After 15 days storage, highest average score of colour, flavour, taste, appearance and overall acceptability were noted 8.95, 7.98, 8.00, 7.00 and 8.22 respectively of treatment T7 and least score of colour, flavour, taste, appearance and overall acceptability were noted 5.98 (T1), 5.93 (T1), 5.93 (T2), 5.93 (T3) and 6.08 (T1) respectively.

After 30 days storage, highest average score of colour, flavour, taste, appearance and overall acceptability were noted 8.92, 7.95, 7.95, 6.96 and 8.19 respectively of treatment T7 and least score of colour, flavour, taste, appearance and overall acceptability were noted 5.93 (T1), 5.90 (T5), 5.90 (T2), 5.89 (T3) and 6.05 (T1) respectively.

Table.1 Organoleptic score of Nectar during recipe standardization

S. No	Treatment	Colour	Flavour	Taste	Appearance	Overall acceptability	Remarks
1	T ₁ (20% pulp +16% TSS +0.3% acidity)	6.02	5.97	6.02	6.00	6.14	Like slightly
2	T ₂ (20% pulp+17% TSS +0.3% acidity)	6.06	6.02	5.97	6.00	6.41	Like slightly
3	T ₃ (20% pulp+18% TSS +0.3% acidity)	6.08	6.05	6.05	5.98	6.42	Like slightly
4	T ₄ (20% pulp+19% TSS +0.3% acidity)	7.01	7.02	6.02	5.99	7.51	Like moderately
5	T ₅ (20% pulp+20% TSS +0.3% acidity)	7.05	5.97	5.98	6.04	7.02	Like moderately
6	T ₆ (20% pulp+21% TSS +0.3% acidity)	8.01	6.00	7.90	6.09	7.20	Like moderately
7	T ₇ (20% pulp+22% TSS +0.3% acidity)	8.96	8.02	8.02	7.02	7.93	Like very much

After 45 days storage, highest average score of colour, flavour, taste, appearance and overall acceptability were noted 8.89, 7.91, 7.92, 6.91 and 8.16 respectively of treatment T7 and least score of colour, flavour, taste, appearance and overall acceptability were noted 5.91 (T1), 5.87 (T1 and T5), 5.87 (T2), 5.85 (T3) and 6.02 (T1) respectively.

The organoleptic score below 6 shows non suitability of product for consumption. The RTS had a slight decrease in organoleptic quality during storage duration at ambient conditions.

There was substantial reduction in organoleptic average score for colour, flavor, taste, appearance and overall acceptability in course of preservation.

There are several of external causes which govern the preservation ability of product and temperature is an integral one.

Due to unfavorable condition such as low pH and excessive temperature rise, here is some variance that caused development of undesirable pigments

this causes beverages taste to degrade. The recipe comprising of 20% pulp, 0.3% acidity and 22% TSS was found suitable for preparation of dragon fruit Nectar.

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