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To study about biochemical changes (pH, ascorbic acid and total sugar %) of dragon fruit RTS during storage

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Abstract

The current investigatory work entitled "study about biochemical changes (pH, ascorbic acid and total sugar %) of dragon fruit RTS during storage" was executed at Pomology Laboratory, Department of Pomology, Pt K.L.S. CHRS, Pendri, Rajnandgaon, IGKV, Raipur, Chhattisgarh during year 2019-2020. The analysis of chemical variation 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. The RTS prepared from treatment T7 containing 10 percent pulp, 0.3 percent acidity and 15 percent TSS shows highest value of ascorbic acid and total sugar, while the pH value of RTS was peak for treatment T5 comprising of 10% pulp, 0.3% acidity, 13% TSS.

Keywords: Dragon fruit (*Hylocereus costaricensis*), pH, ascorbic acid, Total sugar, RTS, Replication, treatment, biochemical

1. 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 cinderella plant. 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. (Nomura *et al.*, 2005) ^[2]. 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 antioxidant 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. (Nomura *et al.*, 2005) ^[2]. 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 The favourable atmospheric condition for its farming is dry, tropical or subtropical. where yearly rainfall ranges from 50 cm per year and temperature 20-30°C. Approximate 20 cm stem cuttings are planted in distance of 2×2m. It is an aereophyte plant that needs marshy land and a hot and moist environment. During July to November months fruits are seen in market. It is grown in damped area, intermediate area and parched area with watering facilities. In world it is grown in at least 22 countries in the tropics including Australia, Cambodia, China, Malaysia, Thailand, Srilanka. Although dragon fruit expansion in India is less than 100 acres. But Nowadays, these fruits are planted in many regions like Pune, Ahmednagar, Aurangabad, Sholapur, Sangali in Maharashtra. 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) ^[1]. 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.

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2. Materials and Method

The recent research on study about biochemical changes (pH, ascorbic acid and Total sugar %) of dragon fruit RTS during storage 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. 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. Equipment and instruments required for analysis of product are provided by Soil Science laboratory, S.K.S College of Agriculture and Research Station, Rajnandgaon C.G.

The bottles of RTS beverage was stored under favourable environment for further analysis and observation upto 45 days and analysis conducted at 15 days interval. The pH was evaluated by usage a digital pH meter after calibrating it with buffer pH 4.0 and 9.2, ascorbic acid content of RTS is analysed by the standard methods described by Ranganna (1997) [3], total sugar was estimated by procedure of Lane and Eynon as described by Ranganna (1997) [3].

3. Result and Discussion

The dragon fruit RTS shows following biochemical variation during storage At its initial preservation time peak pH value observed was 4.97 for treatment T5(10 percent pulp+13 percent TSS + 0.3 percent acidity), After 15 days storage of dragon fruit RTS peak pH value observed was 4.89 with the treatment T5(10 percent pulp+13 percent TSS + 0.3 percent acidity), After 30 days storage of dragon fruit RTS peak pH value observed was 4.62 with the treatment T5(10 percent pulp+13 percent TSS + 0.3 percent acidity), After 45 days storage of dragon fruit RTS peak pH value observed was 4.40 with the treatment T5(10 percent pulp+13 percent TSS + 0.3 percent acidity) At its initial preparation time peak ascorbic acid value observed was 13.10 with the treatment T7(10 percent pulp+15 percent TSS + 0.3 percent acidity),After 15 days storage of dragon fruit RTS peak ascorbic acid value observed was 12.80 with the treatment T7(10 percent pulp+15 percent TSS + 0.3 percent acidity), After 30 days storage of dragon fruit RTS peak ascorbic acid value observed was 12.50 with the treatment T7(10 percent pulp+15 percent TSS + 0.3 percent acidity),After 45 days storage of dragon fruit RTS peak ascorbic acid value observed was 10.10 with the treatment T7(10 percent pulp+15 percent TSS + 0.3 percent acidity).

At its initial preparation time peak total sugar value observed was 12.40 with the treatment T7(10 percent pulp+15 percent

TSS + 0.3 percent acidity),After 15 days storage of dragon fruit RTS peak total sugar value observed was 12.41 with the treatment T7(10 percent pulp+15 percent TSS + 0.3 percent acidity),After 30 days storage of dragon fruit RTS peak total sugar value observed was 12.43 with the treatment T7(10 percent pulp+15 percent TSS + 0.3 percent acidity), After 45 days storage of dragon fruit RTS peak total sugar value observed was 12.47 with the treatment T7(10 percent pulp+15 percent TSS + 0.3 percent acidity).

4. Conclusion

It is evident from findings that the pH and ascorbic acid value of RTS shows diminishing trend with enhancement in time of storage (0-45 days), while the total sugar value of RTS shows growing pattern with enhancement in course of preservation (0-45 days).

5. References

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