

STANDARDIZATION OF RECIPE AND DRYING METHOD FOR CANDY MAKING OF BER (ZIZYPHUSMAURITIANA L.) CV. UMRAN

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ABSTRACT

The present investigation revealed that, candies treated with R₃ (80 % sugar solution + 1 % citric acid) showed maximum TSS (80.79 °Brix) and total sugar content (98.22%), whereas, the maximum titrable acidity (1.29%) and ascorbic acid content (25.30%) were observed in R₁ (60 % sugar solution + 1 % citric acid). The chemical characteristics like TSS, titrable acidity, ascorbic acid and total sugar content were obtained maximum intreatmentD₁ (Sun drying) in the candies in her during the entire storage periods. The treatment combination R₃D₁ (80 % sugar solution + 1 % citric acid and sun drying) recorded to have higher total sugar content (99.88%), whereas the paramount TSS (80.83 and 80.83 °Brix) and titrable acidity (1.30%) were recorded in treatments (R₃D₂ and R₃D₃) and R₁D₁, respectively.

KEYWORDS: Ber Candy, Recipe And Drying Methods

INTRODUCTION

Ber (*Zizyphusmauritianal* Lamk.) is one of the most ancient fruits of India and is ranked third in fruit production. It belongs to genus *Zizyphus*, of family *Rhamanaceae*. The genus *Zizyphus*, includes about 50 species, out of which, 18 to 20 are native of India (Watt, 1893). It is commonly accepted as a dry farm crop.

Ber is mainly grown in the states of Andhra Pradesh, Bihar, Gujarat, Haryana, Madhya Pradesh, Maharashtra, Punjab, Rajasthan and Uttar Pradesh, (Pareek, 1983). The predominant cultivars that are being grown in Gujarat are Umran, Kadaka, Sanaur-3, Sanaur-6 and Popular Gola. Attractive and fascinating ber fruits can be considered as the gift of nature to mankind. Conventionally, ber is considered as a poor man's apple. It is valued for its nutritional qualities and is a rich source of vitamin-C, A and B-complex. Ber is a perishable fruit and needs to be consumed or processed immediately, and also it cannot be stored safely in normal condition for a long time. Besides this, the post-harvest losses of fruits in our country are up-to 30 per cent, which reduce the per capita availability (Subrahamanyam, 1986). Much attention needs to be given to post-harvest management and value added of this perishable fruit.

Completely Randomized Design with Factorial concept was followed in the experiment with two factor viz. Factor a: Different recipe, Factor B: drying method and their combinations.

The ber fruits were dipped in water for discarding light and infested fruits. These fruits were then cleaned under running tap water to remove impurities and dust from the surface of fruits. The fruits were peeled and cut into pieces with uniform size, then blanched in boiling water at 98 ± 2 °C for 2-3 min as per the method suggested by Kadam et al, 1991. Then Sugar syrup was made with different recipes and dried with different drying methods then

With increased production of a particular fruit in a season, there is a glut in the market and the farmer is at loss due to low market price for his produce. This is also true in case of ber. It is therefore necessary to develop suitable technology for processing of the fruits. Thus the processing of beer into marketable demanded products likes, pulp, juice concentrates, jams, jelly, syrup, bear candy, berry powder, tutti-fruity, slices, shreds and wine will help to increase the shelf life, minimize the glut in the market during its peak season of production, reduces post-harvest losses, enhances the export, which ultimately fetches the valuable foreign exchange and improves socioeconomic conditions of farmers, processors and entrepreneurs. Now days, the processing aspect of ber fruit is receiving some attention. Among the different processes, candy making has been proved to be viable and appropriate for preparation of beer candy, much longer time is required. Therefore, it is necessary to minimize the time of candy making process. This could be done by reducing time of syruring and by minimizing the time of drying, without affecting the quality of her candy.

MATERIALS AND METHODS

An investigation was carried out in the post graduate Laboratory, Department of Horticulture, Junagadh Agricultural University, Junagadh during 2011-12. The packaging of candy of each treatment under study was done in polypropylene (pp) pouches of 50 μ thickness of 100 g packets and was stored during February-April, 2012 at room temperature (18.2-38.2 $^{\circ}$ C and 17.2-79.3 % RH) for a period of 3 months & observations were recorded at an interval of 30 days.

RESULT AND DISCUSSIONS

The experimental results revealed that the candy making significantly influenced due to different a recipe and drying method of ber.

Table 1: Effect of Recipe and Drying Methods on Quality Parameters of Ber Candy at 90thDays

Treatment	Treatment Details	TSS ($^{\circ}$ Brix)	Acidity (%)	Ascorbic Acid (Mg/100 G)	Total Sugars (%)
A. Recipe					
R ₁	60% sugar solution + 1% citric acid	61.44	1.29	25.30	78.19
R ₂	70% sugar solution + 1% citric acid	70.94	1.18	22.56	91.03
R ₃	80% sugar solution + 1% citric acid	80.79	0.94	19.76	98.22
S.Em. \pm		0.17	0.02	0.17	0.14
C.D. at 5%		0.50	0.06	0.50	0.41
B. Drying method					
D ₁	Sun drying	71.67	1.20	23.14	90.87
D ₂	Oven drying	70.89	1.12	22.34	89.27
D ₃	Tray drying	70.61	1.09	22.17	87.31
S.Em. \pm		0.17	0.02	0.17	0.14
C.D. at 5%		0.50	0.06	0.50	0.41
C.V. %		0.73	4.01	2.20	0.47
Interaction		SIG.	SIG.	NS	SIG.

Table 2: Interaction Effects of Recipe and Drying Methods on Quality Parameter of Ber Candy at 90th Days

Treatment (R×D)	TSS (⁰ Brix)	Acidity (%)	Ascorbic Acid (Mg/100 G)	Total Sugars (%)
R ₁ D ₁	62.67	1.30	25.76	79.32
R ₁ D ₂	61.33	1.29	25.01	78.22
R ₁ D ₃	60.33	1.28	25.13	77.03
R ₂ D ₁	71.67	1.23	23.29	93.42
R ₂ D ₂	70.50	1.16	22.80	91.36
R ₂ D ₃	70.67	1.15	21.58	88.32
R ₃ D ₁	80.67	1.08	20.36	99.88
R ₃ D ₂	80.83	0.90	19.21	98.22
R ₃ D ₃	80.83	0.83	19.80	96.57
S.Em.±	0.30	0.03	0.29	0.24
C.D. at 5%	0.90	0.09	NS	0.71
C.V. %	0.73	4.01	2.20	0.47

Different Recipe and Drying Method

Among the different recipe significantly maximum TSS (80.790Brix) and total sugars (98.22 %) at 90th day was found in R₃ (80% sugar solution + 1% citric acid), whereas, significantly lowest TSS and total sugar was found in R₁ (60% sugar solution + 1% citric acid). While, significantly maximum acidity (1.29 %) and ascorbic acid (25.30 mg/100g) at 90th day was found in R₁ (60% sugar solution + 1% citric acid), whereas, significantly lowest acidity and ascorbic acid was found in R₃ (80% sugar solution + 1% citric acid). In case of drying treatment, at 90th day significantly maximum TSS, acidity, ascorbic acid and total sugar (71.670Brix, 1.20%, 23.40 mg/100g and 90.87 %) was found in D₁ (Sun drying) respectively, whereas, lowest TSS, acidity, ascorbic acid and total sugar was found in D₃ (Try drying) in ber candy (Table 1). The decrease in ascorbic acid in candies, during storage might be due to oxidation or irreversible conversion of L-ascorbic acid, into dehydro ascorbic acid oxidase (ascorbimase). The decrease in ascorbic acid is also might be due to its oxidation to dihydroxy-ascorbic acid, during storage period and high temperature during tray drying. And, in decrease in ascorbic acid during storage period was also reported by Gupta et al. (1980) in ber candy, Kumar (1998) in papaya candy, Antala (2010) in guava slices.

Interaction Effect of Recipe and Drying Methods

It is evident from data that the interaction effect of recipe treatments and drying methods on total soluble solids content was maximum at 90th day of storage found in R₃D₂ (80.83 0Brix) and R₃D₃ (80.83 0Brix) which was at par with R₃D₁ (80.670Brix), while lowest TSS was found in R₁D₃. However, maximum acidity was found in R₁D₁ (1.30 %) which was found at par with R₁D₂, R₁D₃ and R₂D₁ whereas lower acidity (0.83 %) was found in R₃D₃. At 90th day of storage ascorbic acid content of ber candy was found non-significant. Significantly, maximum total sugars was found in R₃D₁ (99.88 %), at 90th day during storage. While significantly minimum total sugars was found in R₁D₃.

CONCLUSIONS

Results have clearly indicated that the treatment R₃D₁ (80 % sugar solution + 1 % citric acid and sun drying) was best for the chemical characteristics of ber, as the sun drying regulates the process of osmosis and concentration of sugar in the candies.

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