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EFFECT OF STORAGE ON THE QUALITY OF DEHYDRATED GUAVA (*PSIDIUM GUAJAVA*-L)

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Guava was purchased from the local market for dehydration. The powder was packed in sealed polyethylene bags, closed jars and dessicator at room temperature (13-35°). The fresh guava was analysed for chemical composition. The freshly prepared guava powder was also analysed and contained 5.2% moisture and 1426.30 mg/100g ascorbic acid. The powder was also analysed for non-enzymatic browning measured as optical density (O.D) at 440 nm. The guava powder packed in different containers, was analysed periodically at monthly intervals for 9 months. Maximum retention of ascorbic acid was observed in powder stored in dessicator and minimum kept in polyethylene bags. The effect of SO_2 on the quality of guava powder and moisture on the loss of ascorbic acid was also studied.

Key words: Guava powder, Non-enzymatic browning, Ascorbic acid.

Introduction

Guava (*Psidium guajava* Linn.) is the most important commercial fruit crop of Myrtaceae family. The total production of this fruit was 0.25 million tonnes during 1983[1]. It is round oval shaped and green yellow in colour and shows a creamy or pink pulp. The fruit has a distinct musky flavour which is slightly reduced during processing. The fruit is perishable in nature and cannot be stored for a long time. The weight of fruit ranges from 15-250g. It is a rich source of ascorbic acid, having four to five times more than that in citrus fruits [2-4]. Ascorbic acid is the most labile of all vitamins contained in fruits, is water soluble and is rapidly destroyed by heat, light and oxidation. Losses vary from 10-15% during preparation of fruit for drying [5-8]. SO_2 possesses bactericidal properties and also inhibits enzymatic and non-enzymatic browning [9,10]. Embs *et. al.* [9] found that the mechanism of SO_2 inhibition of browning caused by polyphenol oxidase (PPO), is the SO_2 reaction with some substrate compounds (such as the enzymatically produced O-quinones- from the existing polyphenols), as well as the direct enzyme inactivation by the SO_2 Work on the preparation of guava juice, nectar, canned halves. Jelly of paste has been reported [11,12]. The effect of SO_2 and moisture on the quality of guava powder and ascorbic acid retention is reported in this paper.

Material and Methods

Guava (white variety) was purchased from local market. Ripe and sound fruit was selected for dehydration. The fruit was washed in the running water to remove adherent dust. The fruit was trimmed and made into four vertical pieces. The sliced fruit was dipped in Potassium meta-bisulphite solution (0.2%) for 5 min. and then dehydrated in the Mitchel dehydrator at 140 ^{0}F. The dry product was powdered and packed in sealed polyethylene bags, closed glass jars and dessicator at room temperature (13- 35°).

Samples from the product stored at room temperature in different containers were drawn for analysis after one month interval. The results were mean values of three experiments. Moisture, total titratable acidity as citric acid, sugars, ascorbic acid and SO_2 were determined according to the methods of AOAC [13]. pH values were recorded with a pH meter. Total soluble solids were determined using Abbe refractometer. Non- enzymatic browning of the powder was measured as optical density by using spectrophotometer (Erma Model LS[7]). The sample was prepared by extracting the colour of 5g dry weight in 100 ml 60% alcohol, which was measured at wavelength of 440 nm.

Results and Discussion

Chemical composition of fresh guava is given in Table 1. Moisture, SO_2, non-enzymatic browning and ascorbic acid of guava powder in different containers, during storage at room temperature is given in Table 2. The data revealed that the product contained 1426.3 mg/100g.

TABLE 1. CHEMICAL COMPOSITION OF FRESH GUAVA FRUIT.

Parameters per 100g except pH	
Moisture (g)	76.50
Total soluble solids (g)	8.00
Total acidity as citric acid (g)	0.123
Total sugars (g)	7.80
Reducing sugars (g)	4.40
Ascorbic acid (mg)	360.0
pH	4.0

TABLE 2. MOISTURE, SO_2, NON-ENZYMATIC BROWNING AND ASCOPBIC ACID OF GUAVA POWDER STORED AT ROOM TEMPERATURE (13-35°).

Storage	Polyethylene bags				Glass jars				Dessicator			
Period	Moisture (%)	SO_2 (%)	Ascorbic acid (mg/100g)	Browning (OD)	Moisture (%)	SO_2 (%)	Ascorbic acid (mg/100g)	Browning (OD)	Moisture (%)	SO_2 (%)	Ascorbic acid (mg/100g)	Browning (OD)
	5.20	100.00	1426.30	0.550	5.20	100.0	1426.30	0.550	5.20	100.0	1426.30	0.550
1	6.10	90.60	925.20	0.560	5.22	92.40	984.25	0.550	4.06	94.60	1015.10	0.550
3	8.50	84.55	503.14	0.590	6.25	86.90	560.50	0.580	3.48	88.32	964.56	0.560
6	10.10	66.40	145.50	0.630	7.80	70.80	207.00	0.620	2.60	72.35	550.30	0.590
9	11.60	52.65	114.30	0.660	8.10	58.50	128.20	0.660	2.10	65.10	446.25	0.60

* O. D = Optical density.

ascorbic acid, 5.2% moisture and browning 0.55 measured as optical density after one week of dehydration. After one month storage it showed 925.2 mg/100g ascorbic acid, 6.10% moisture, 90.60% SO_2 and browning 0.56 O.D. in the powder stored in sealed polyethylene bags; 984.25mg/100g ascorbic acid, 5.22% moisture, 924.4% SO_2 and colour 0.55 O.D. in powder stored in glass jars and 4.06% moisture, 1015.10 mg/100g ascorbic acid, 94.60% SO_2 and non-enzymatic browning 0.55 measured as O.D. in the powder stored in dessicator. Ascorbic acid, moisture, SO_2 and colour of the product, determined after 3, 6 and 9 months is also given in Table 2. After one month storage maximum retention of ascorbic acid (1015.10mg/100g) was observed in powder stored in dessicator and minimum (925.20mg/100g) in the powder stored in polyethylene bags and also maximum browning (0.56 O.D.) was seen in the powder stored in polyethylene bags and minimum browning (0.55 O.D.) in the powder stored in the dessicator. Maximum retention of ascorbic acid (446.25mg/100g) was noted in the powder stored in dessicator and minimum (114.30mg/100g) in the powder stored in the polyethylene bags after 9 months storage. Maximum retention of ascorbic acid was shown in the product stored in dessicator due to less moisture content (2.10% after 9 months storage) and minimum in the polyethylene bags due to high moisture content (11.6% after 9 months storage). The non-enzymatic browning was least (0.60 O.D. after 9 months) in the powder stored in dessicator and high (0.66 O.D. after 9 months) in the powder stored in polyethylene bags. The effect of SO_2 on the colour of the powder is clearly explained in Table 2. The product containing maximum retention of SO_2 is least discoloured and that showing minimum SO_2 content gave high non-enzymatic browning.

The product was organoleptically evaluated by a group of 25 panelists on 5 point hedonic scale [14]. The panelists rated superior the product stored in dessicator containing least browing and high amount of ascorbic acid.

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