

EFFECT OF DIFFERENT VARIETIES AND PRETREATMENTS ON YIELD AND QUALITY OF DRIED FIG FRUITS

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ABSTRACT

The present investigation was undertaken to study the effect of pretreatments on yield and quality of dried fig fruits. The five varieties of fig viz., Conadria, Deanna, Excel, Poona fig and Dinkar were given various pretreatments such as blanching, sulphitation and blanching plus sulphitation. It was found that out of these five varieties the attractive and firm dried figs could be prepared from the Deanna variety followed by Conadria. Moreover, the fig fruits of Deanna variety had maximum weight (46.64 g), high total soluble solids (21.20 per cent) and low acidity (0.15 per cent) which made the beneficial effect on maintaining colour, flavour and texture of final product.

INTRODUCTION

Fig (*Ficus carica* L.) belongs to the family Moraceae. The fig is a native of Southern Arabia. The main fig growing countries are Italy, Spain, Turkey, Greece, Portugal and Algeria. It is also extensively grown in California (USA) and Afghanistan. The total area under fig cultivation in India is about 1000 hectares of which 400 hectares is in Maharashtra (Singhal, 1998) which further increased to 883 hectares with the production of 2650 metric tonnes (Anonymous, 2002). In India, its commercial production is limited to a few centres in Maharashtra and South India. In Maharashtra, it is cultivated on commercial scale in adjoining areas of Pune and Aurangabad. The varieties of fig viz., Poona fig and Dinkar are under commercial cultivation. However, these varieties are not found suitable for preparation of dried fig fruits owing to various reasons such as low TSS, high acidity, leathery appearance and taste of the final product. There are 3 new exotic collections viz., Deanna, Conadria and Excel in this department which have been found to give high yield and more TSS. Therefore, the present investigation was undertaken to screen all these varieties for preparation of dried fig when given various pretreatments such as blanching, sulphitation and blanching plus sulphitation.

MATERIAL AND METHODS

The experiment was carried out in the Post Harvest Technology Laboratory, Department of Horticulture, Mahatma Phule Krishi Vidyapeeth, Rahuri in a factorial completely randomised design with three replications. The fig fruits cv. Conadria, Deanna, Excel, Poona fig and Dinkar were obtained from the All India Coordinated Research Project on Arid Zone Fruit. These varieties were screened for various physico-chemical characteristics such as shape, colour, average length (cm), average diameter (cm), average weight of fruit (g), average volume (ml), specific gravity (m/v), moisture (%), total soluble solids (%), total acidity (%), reducing sugars (%), non-reducing sugar (%) and total sugars (%). These fruits were then given following pretreatments for the preparation of dried fig fruits.

A. Pre-treatments: The quantity of fig fruits cv. Poona fig, Dinkar Deanna, Conadria and Excel taken for processing for every treatment was 2.5 kg. Coding for each variety was done as under A₁ - Conadria, A₂ - Deanna, A₃ - Excel, A₄ - Poona fig and A₅ - Dinkar.

Various pre-treatments given are as under

B₁ - Blanching: The fruits were

subjected to blanching treatment in boiling water ($98 \pm 2^{\circ}\text{C}$) for different periods (7, 9 minutes). The blanching period was standardized by conducting enzyme test for its adequacy.

B₂ - Sulphitation: Fruits were dipped in 1 per cent KMS solution (1 : 2) for 30 minutes and then drained.

B₃ - Blanching + Sulphitation: First blanching treatment was given as described earlier and then sulphitation treatment was given as described earlier.

B. Drying of fruits: The pre-treated fruits were subjected for drying in the cabinet drier at $50\text{-}50^{\circ}\text{C}$ for 15-18 hours depending upon the variety to reduce the moisture content to safe level of 15-20 per cent (Thonte and Patil, 1988). The prepared material was placed on trays at the rate of 5 kg per square meter of tray surface and the humidity at the exist end of the cabinet drier was 45 per cent.

The total soluble solids were determined with the help of hand refractometer in Brix. The acidity of fruit was determined by AOAC (1975) method expressed in terms of citric acid. Reducing sugar content was determined by titration with fehling solution (Ranganna, 1978). The organoleptic evaluation for assessing the colour flavour and texture of dried fig fruits was done by a panel of seven judges by keeping dehydrated fig fruits as such before them and evaluation was done by using a nine points Hedonic scale (Amerine *et al.*, 1965).

C. Storage of Dried fig fruits: The dried fig thus prepared by the above methods were packed in polyethylene bags (400 gauge) and stored upto 6 months at room temperature ($7.50 - 40.90^{\circ}\text{C}$) and low temperature (5°C). The periodical observations on various physico-chemical parameters were noted at an interval of 30 days and data were analysed by using ANOVA technique in a factorial completely randomised design given by Gomez and

Gomez (1984).

RESULTS AND DISCUSSION

Physico-chemical characteristics of fresh fig fruits

The data on physico-chemical characteristics of the fresh fig fruits cv. Conadria, Deanna, Excel, Poona fig and Dinkar are presented in Table 1.

The external skin colour of Conadria, Deanna, Excel, Poona fig and Dinkar was found to be greenish, golden yellow, greenish yellow, reddish green and dark red, respectively. However, flesh colour of these varieties was found to be crimy pinkish, crimy white, crimy, pinkish and dark pink, respectively. The fruits of cv. Deanna and Excel varieties looked bell shaped while Conadria, Poona fig and Dinkar had pear shaped fruits. The average weight of fruit was found to be maximum in Deanna (46.64 g) followed by Conadria (38.76 g) and Dinkar (25.76 g), whereas it was the minimum in Poona fig followed by Excel. The specific gravity was found to be maximum in Poona fig followed by Dinkar whereas it was the minimum in Deanna fig. The average volume of the fruits was found to be maximum in Deanna followed by Conadria and Excel whereas it was the minimum in Dinkar followed by Poona fig. The total soluble solids were found to be maximum in Deanna (21.20 %) followed by Conadria (20.15 %) whereas they were minimum in Dinkar. The reducing and total sugars were found to be maximum in Deanna followed by Conadria and Excel whereas there were found minimum in Dinkar followed by Poona fig.

Effect of various varieties and pretreatments on yield and quality of dried figs

The data on effect of various varieties and pretreatments on yield and quality of dried figs have been in Table 2. It was obvious from the data that the yield of dried fig was found to be maximum in Deanna (22.85, 23.98 and 19.82 per cents for B₁, B₂ and B₃, respectively)

Table 1. Physico-chemical characteristics of fresh fig fruits

Particulars	Varieties				
	Conadria	Deanna	Excel	Poona fig	Dinkar
Shape	Pear shaped	Bell shaped	Bell shaped	Pear shaped	Pear shaped
Colour					
a. External	Greenish	Golden yellow	Greenish yellow	Reddish green	Dark red
b. Flesh	Crimy pinkish	Crimy white	Crimy	Pinkish	Dark pink
Average length (cm)	7.07	7.81	6.52	6.58	6.80
Average diameter (cm)	13.80	16.03	11.87	12.00	11.81
Average weight of fruit (g)	38.76	46.64	24.72	24.60	25.76
Average volume (ml)	33.68	44.76	21.16	18.80	20.16
Specific gravity (m/v)	1.1580	1.0478	1.1675	1.3076	1.2774
Moisture (%)	80.0	78.0	75.0	76.0	74.0
Total soluble solids (%)	20.15	21.20	19.36	19.34	18.36
Total acidity (%)	0.17	0.15	0.19	0.21	0.23
Reducing sugars (%)	15.66	17.25	14.86	13.76	13.40
Non-reducing sugars (%)	2.08	1.79	1.62	2.25	1.89
Total sugars (%)	17.74	19.04	16.48	16.01	15.29

Table 2. Effect of various varieties and pre-treatments on yield and quality of dried figs

Treatments	Yield of dried figs (%)	Organoleptic evaluation			
		Colour	Flavour	Texture	Overall
A ₁ B ₁	22.08	6.00	6.00	7.00	6.33
A ₁ B ₂	23.11	6.00	5.00	7.00	6.00
A ₁ B ₃	18.09	7.03	7.00	8.00	7.34
A ₂ B ₁	22.85	7.50	7.00	8.00	7.50
A ₂ B ₂	23.98	7.25	7.00	8.00	7.41
A ₂ B ₃	19.82	8.50	8.00	9.00	8.50
A ₃ B ₁	21.40	6.50	5.00	7.00	6.16
A ₃ B ₂	21.62	6.00	5.00	6.00	5.66
A ₃ B ₃	16.79	7.25	5.75	7.50	6.66
A ₄ B ₁	20.35	6.10	5.00	7.00	6.03
A ₄ B ₂	21.91	6.00	5.00	6.00	5.66
A ₄ B ₃	17.16	6.75	6.00	7.00	6.58
A ₅ B ₁	20.56	5.00	5.00	6.00	5.33
A ₅ B ₂	22.53	5.00	4.00	6.00	5.00
A ₅ B ₃	17.76	6.00	5.00	7.00	6.00
Mean	-	6.46	5.72	7.14	6.41
Factor A					
S.E. ±	-	0.23	0.32	0.31	0.15
C.D. at 5 %	-	0.66	0.93	0.91	0.43
Factor B					
S.E. ±	-	0.18	0.25	0.24	0.12
C.D. at 5 %	-	0.51	0.72	0.70	0.33
A x B					
S.E. ±	-	0.39	0.56	0.54	0.26
C.D. at 5 %	-	0.11	0.16	0.16	0.75

followed by Conadria (22.08, 23.11 and 18.09 per cents for B₁, B₂ and B₃, respectively). Among various pretreatments tried, the yield of dried figs in sulphitation pretreatment was found to be the highest followed by blanching and blanching plus

sulphitation irrespective of varieties.

This is probably due to the effect of blanching treatment alone or blanching in combination with sulphitation in which during the blanching process, the fruits were held in boiling water for 7-9 minutes depending upon the variety and as such tissues of fruits were softened and air pockets were completely removed etc. Therefore, the fruits after drying

remained compact and there were no air pockets found in blanching treatment and as such there was no scope for the dried fig to absorb moisture as it happened in sulphitation treatment which looked bulky during and after storage. The dried fruits prepared from the Deanna variety obtained maximum colour, flavour, texture and overall score when evaluated organoleptically.

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