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## Physico-chemical characteristics of fig fruit (*Ficus carica* L.) cv. DINKAR and its cabinet dried powder

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### ABSTRACT

Fresh fig fruits cv. DINKAR were evaluated for their physical and chemical characteristics. The fresh fig fruits were found to be very rich source of potassium (357 mg/100g), total sugars (16.25 g/100g) and appreciable source of fibre (1.20 g/100g) and therefore fig has great potential for processing. Fig fruits were dried by subjecting them in the form of small shreds in a Cabinet drier at  $60\pm 5^{\circ}\text{C}$  temperature for 20-24 hrs. Finally, powder was obtained by grinding of dried shreds in a mixer/grinder. Fig powder was found to be a rich source dietary of fibre (15.41 g/100g), sugar (61.52 g/100g) and potassium (22 g/100g). The prepared fig powder can be utilized in the various value added products viz., icecream, milk shake, burfi and toffee.

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**Key words :** Fig powder, Cabinet dryer, Physico-chemical characteristics

### INTRODUCTION

Fig (*Ficus carica* L.) belongs to the family *Moraceae*. The fig is a native of southern Arabia. 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 (Anonymous, 2002). As per the annual report of year 2010 given by Department of Agriculture, Maharashtra State the area under cultivation of fig fruits was 300 hectares up to 1990, which further increased to 3443 hectares in 2010. Fig fruit is a combination of fibre and minerals such as calcium, iron, potassium and nutrients that are unequalled in nature. The edible fig as a powerhouse of nutrients and is known since the prehistoric times (Venu *et al.*, 2005). The fig, one of the most important fruit species in the Mediterranean area, bears fruits that are highly perishable, even in refrigerated conditions (Piga *et al.*, 1995) and thus nearly all the world production is preserved in the dried form. Cabinet drying considered being the generic drying method followed for preparation of various food powders.

### MATERIALS AND METHODS

#### Preparation of fig powder:

In fig fruit because of high sugar content (TSS), more period of drying is required. The procedure followed during the cabinet drying of fig fruit is summarized in following flow chart (Fig. 1).

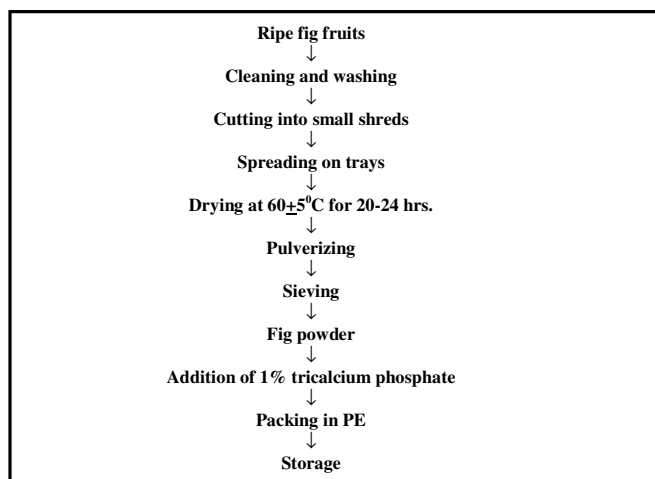


Fig. 1: Flow chart for preparation of fig fruit powder by cabinet drying

### Physical analysis:

Fully mature fig fruits, cv. DINKAR were obtained from the farmer's field. Fruits were washed with clean running water. Then, the fig fruits and fig powder were analyzed for various physical characteristics like colour, length, width, weight, volume, specific gravity, shape index, fullness index and waste (%).

### Chemical analysis:

The fresh fig fruits and cabinet dried fig powder were analyzed for moisture, ash, T.S.S., pH, acidity, sugar, protein, fat, fibre, ascorbic acid,  $\beta$ -carotene and potassium by the methods given by A.O.A.C. (1990) and Ranganna (1995).

## RESULTS AND DISCUSSION

The results obtained from the present investigation as well as well as relevant discussion have been presented under following heads :

### Physico-morphological characteristics of fig fruits:

The physico-morphological properties of fig (*Ficus carica* L.) fruits are given in Table 1.

Table 1 : Physico-morphological properties of fig fruits		
Sr. No.	Physical parameter	Measurement/Value
	Cultivar	Dinkar
1.	Colour	Color
	External	Dark Red
	Flesh	Dark Pink
2.	Length (cm)	3.8
3.	Width/ diameter (cm)	3.95
4.	Weight (g)	27.23
5.	Volume (ml)	28.7
6.	Specific gravity	0.948
7.	Shape index	0.96
8.	Fullness index	6.89
9.	Waste (%)	2.4

Table 1 shows that, the external or skin colour of Dinkar cultivars of fig fruits was dark red. The average weight of fruit was recorded 27.23 g. The average length and diameter of Dinkar cultivar was found to be 3.8 and 3.95 cm, respectively. The average volume of Dinkar figs was 28.7 ml. The values of specific gravity of figs were found to be 0.948. Shape index of fruit was 0.96. The fullness index of Dinkar figs was found to be 6.89. The values of per cent waste of fruits were found to be 2.4 %.

The above observations recorded for Dinkar cultivar with respect to all the physico-morphological parameters are in close agreement with those reported by Waskar *et*

*al.* (2003).

### Chemical characteristics of fig fruits:

The chemical parameters of fig fruit with respect to its moisture, ash, T.S.S., pH, acidity, sugar, protein, fat, fibre, ascorbic acid,  $\beta$ -carotene and potassium were studied in detail. The data pertaining to various chemical properties of fig fruit are depicted in Table 2.

Table 2 : Chemical properties of fig fruits		
Sr. No.	Chemical parameter	Measurement/Value
1.	Moisture (%)	78.8
2.	Ash (%)	0.91
3.	T.S.S. ( $^{\circ}$ Bx)	20
4.	Acidity (%) (as citric acid)	0.19
5.	T.S.S. : Acid ratio	105.26
6.	pH	5.1
7.	Total sugar (%)	16.25
8.	Reducing sugar (%)	14.65
9.	Non-reducing sugar (%)	1.60
10.	Protein (%)	2.93
11.	Fat (%)	0.24
12.	Ascorbic acid (mg/100 g)	13.26
13.	$\beta$ -Carotene ( $\mu$ g/100g)	38.6
14.	Potassium (mg/100g)	357
15.	Dietary fibre (%)	1.20

The chemical composition results obtained in the present investigation revealed that the moisture content of fig fruit was 78.8 per cent. The dietary fibre content of fig fruit was found 1.20 per cent. The total acidity (as citric acid) content was observed as 0.19 per cent against pH value of 5.1. It was also revealed that the fig contained 20 $^{\circ}$ Bx total soluble solids. The values observed for reducing and non-reducing sugar content of Dinkar cultivar was found to be 14.65 and 1.60 per cent, respectively. The value of potassium content was found in fig fruit was 357 mg/100g.

### Physical parameters of fig fruit powder:

The results of the physical properties of fig fruit powder (Table 3) indicated that, the colour of cabinet dried fig powder was observed as light brown. The appearance of fig powder was examined by visual mean and appearance was 'course'. In the present investigation, the water solubility for fig fruit powder was recorded as 188 seconds. The solubility is a function of effective moisture content of the finished food powder coupled with low moisture content responsible for fast dissolution. On account of the vital role of bulk density in handling, packaging, transportation and defining processing

**Table 3: Physical properties of fig fruit powder**

Cultivar	Physical properties of Fig powder				
	Colour	Appearance	Water solubility (sec)	Bulk density (g/ml)	Mesh size (BSS/mm)
Dinkar	Light	Course	188	0.61	22/0.71
	brown				30/0.50

conditions, studies on bulk density of fig powder was carried out. So, the bulk density of fig fruit powder was 0.61 g/ml. Finally, the prepared fig powder was sieved and categorized into two sieve sizes as, 22/0.71 and 30/0.50 (BSS/mm).

**Chemical parameters of fig fruit powder:**

The data pertaining to various chemical properties of fig powder are presented in Table 4.

**Table 4 : Chemical properties of fig fruit powder**

Sr. No.	Chemical parameter	Measurement/Value
1.	Moisture (%)	10.43
2.	Ash (%)	3.9
3.	Acidity (%) (as citric acid)	1.40
4.	pH	5.05
5.	Total sugar (%)	61.52
6.	Reducing sugar (%)	55.41
7.	Non-reducing sugar (%)	6.11
8.	Protein (%)	5.26
9.	Fat (%)	2.48
10.	Ascorbic acid (mg/100 g)	5.12
11.	β-Carotene (µg/100g)	46.05
12.	Potassium (mg/100g)	2200
13.	Dietary fibre (%)	15.41

The results of chemical properties of fig powder indicated that the moisture content of fig powder was 10.43 per cent. Hence, due to the less moisture content it is safe for future storage. The dietary fibre content of fig powder was found to be 15.41 per cent. So, the prepared fig powder is fibre rich and significant from nutritional point of view. The values observed for reducing and non-reducing sugar content of fig powder was found to be 55.41 and 6.11 per cent, respectively. It was also observed that the protein content of fig powder was found to be 5.26 per cent. It was revealed that the ascorbic acid content of fig powder was found to be 5.12 mg/100 g. The ascorbic acid content of powder was decreased than that of fresh fruit due to loss of ascorbic acid during drying due to heat sensitivity of nutrient. The value of potassium found in fig powder was 2200 mg/100g and therefore it is rich source of potassium as mineral.

**Conclusion:**

In the present research work as mentioned above, the physico-chemical characteristics fig fruits were determined and the fig powder was prepared by cabinet drying method and analyzed for physico-chemical parameters. Thus, it was concluded that, fresh fig fruits were found to be very rich source of potassium, total sugars and appreciable source of fibre. Fig powder was found to be a rich source of fibre, sugar and potassium. In future, there will be scope for utilization of fig powder in the various value added products viz., icecream, milk shake, burfi and toffee.

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