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**Research Paper****Open Access**STUDIES ON MICROBIAL QUALITY EVALUATION OF FIG MANGO MIX FRUIT  
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The objective of the present investigation was to investigate microbial storage stability of fig mango bar at different storage period. Bar is an intermediate moisture fruit product hence it has good microbial storage stability. The fig mango mix fruit bar was microbiologically evaluated for different storage period the highest total plate count found at 60 days (22) followed by 40 days (15.1) and more stability was observed at 20 days storage period (14.38). From above investigation it was found that fig mango bar is a stable fruit product for various storage period and as storage period increases its colour, flavor and other sensory parameters were going to decreased.

**Keywords:** Fruit bar, Fig, Storage stability, Intermediate moisture

## INTRODUCTION

Fig is a member of the genus *Ficus*, which is in the family *Moraceae* (mulberries). Fig (*Ficus carica L.*) in India, its commercial production is limited to a few centers in Maharashtra and south India. In Maharashtra, it is cultivated on commercial scale adjoining areas of Pune and Aurangabad (Anonymous, 2002). Fig fruit is a rich source of dietary fiber and minerals like calcium, iron and potassium. The edible fig is a powerhouse of nutrients and is known since the prehistoric times (Venu *et al.*, 2005).

Mango (*Mangifera indica L.*) is one of the most important tropical fruits in the world and currently ranked 5<sup>th</sup> in total world production among the major fruit crops (FAO, 2004). Mango (*Mangifera indica L.*) is king of fruits due to its high palatability, excellent taste and flavor. Mango pulp is rich in the essential minerals, vitamins and other nutritive factors. Due to shorter shelf life of the mango, it must be converted into various processed products (Sakhale, 2012).

The consumer trend nowadays is to seek more natural snack foods made from natural fruits, and fruit bar has all the goodness and nutrients of the fruits in it (Che-Man, 1997). Fruit bar is the term used for the products prepared by dehydration of fruit pulp. It is an important confectionary product of commerce in India. Fig bar has been successfully produced and recipe of preparation has also been standardized. However, it was hypothesized that pectin due to its high moisture binding capacity could result into desirable effect on the quality of fig. Hence, the present investigation was carried out to study the effect of different levels of pectin on quality characteristics of fig mango bar.

## MATERIALS AND METHODS

The present study was carried in College of Food Technology, VNMKV, Parbhani. Microbial quality parameter such as total plate count, total viable count, coliform and yeast and mold count Was determine by Harley and Prescott (2002). As well as chemical composition of fig mango bar

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like total sugars, reducing sugar, Total titratable acidity (as citric acid), ascorbic acid was also determined by method given in Ranganna (1995).

### Preparation of Fruit Bar

The process of preparation of fruit bar was followed by Prasad (2009). Fully ripened fig fruits were washed and boiled till it become soft. Fruit were passed through heavy grinder to get soft pulp. TSS was adjusted by adding sugar to 30% of pulp and acid levels was adjusted to 1% using Pearson's Square Method. Different samples with code P<sub>0</sub>, P<sub>1</sub>, P<sub>2</sub>, P<sub>3</sub> and P<sub>4</sub> were prepared with 0.5, 1.0, 1.5 and 2.0% concentration of pectin respectively. The mixtures were dried in cabinet tray dryer at 65±5 °C for 12-14 hr. Samples were removed from dryer, cut into pieces subjected for sensory evaluation and chemical analysis.

**Texture Evaluation:** Texture of fruit bar was analyzed using TA-XT PLUS texture analyzer (stable micro system, Surrey, UK) as by Dangkrjang *et al.* (2009).

**Organoleptic Evaluation of Bar:** Bars were evaluated for sensory characteristics by 25 semi-trained expert panelists on 9-point Hedonic rating.

**Microbial Analysis:** The microbial quality parameter was determined by Harley and Prescott (2002).

**Chemical Analysis:** All chemical parameters were determined by Ranganna (1995).

**Statistical Analysis:** The analysis of variance of the data obtained was done using Completely Randomized Design (CRD) for different treatments as per the methods given by Panse and Sukhatme (1978). The analysis of variance revealed at significance of P<0.05 level, S.E. and C.D. at 5% level is mentioned wherever required.

## RESULTS AND DISCUSSION

In the present investigation, attempts have been made evaluate microbial storage stability of fig mango mix fruit bar for different storage period and its effect on sensory quality parameters of fig mango bar.

### Physical-Morphological Properties of Fresh Fruits

Physical and morphological characteristics of fresh Fig (*Ficus carica* L.) are presented in Table 1.

It was revealed that external skin color of fig fruit as dark red, whereas the flesh was found to be dark pink. The average weight was recorded 26.44 gm. The average length

**Table 1: Physical Characteristics of Fresh Fig Mango Fruits**

S. No.	Parameters	Fig	Mango
1	Color	Dark Red	Yellowish
2	Fruit weight (gm)	26.44	211.12
3	Diameter (cm)	4.1	6.25
4	Length (cm)	3.7	8.6
5	Pulp weight (gm)	98	140.12

and diameter of fruit was found to be 4.1 and 3.7 cm respectively. The per cent waste of fig fruits was recorded 2. In case of mango fruit the colour was observed yellowish, weight was 211.12 gm, diameter 6.25 cm, length 8.6 cm, and wastage was recorded 33.9 respectively. The above observations recorded with respect to all the physico-morphological parameters were in close agreement with those reported by Waskar *et al.* (2003).

Chemical characteristics of fresh Fig (*Ficus carica* L.), fruits are given in Table 2.

The chemical properties of fig fruit revealed that it contained 86% moisture, 2.2% protein, 0.3% fat, 10.5% total carbohydrate. The fig fruit is found to contain 0.5% fiber with 12.29 mg/100 g of ascorbic acid. And in case of mango

**Table 2: Chemical Properties of Fresh Fruits**

S. No.	Constituents	Fig	Mango
1	Moisture (%)	86	82.7
2	Protein (%)	2.2	0.7
3	Fat (%)	0.3	0.6
4	Total carbohydrate (%)	10.5	14.7
5	Ash (%)	0.5	0.5
6	Fiber (%)	0.5	0.8
7	Reducing sugar (%)	9.36	12.3
8	T.S.S. ( <sup>0</sup> Bx)	18	21
9	% Titrable acidity	0.2	0.6
10	pH	5.2	4.3
11	Ascorbic acid (mg/100 g)	12.29	18.6

**Note:** \* Each value is a mean of three determinations.

**Table 3: Microbial Analysis of Fig Mango Mix Fruit Bar**

Sample 10 <sup>3</sup> cfu/g (F <sub>30</sub> M <sub>40</sub> )	0 Days	20 Days	40 Days	60 Days
Coliform count	Nil	Nil	Nil	Nil
Yeast and mold count	Nil	Nil	Nil	Nil
Total bacterial count	Nil	14.38	15.1	22

**Note:** \* Each value is an average of 3 determinations.

fruit moisture content was 82.7%, 0.7% protein, 0.6% fat, total carbohydrates 14.7% and fiber 0.8%. The results of chemical composition are in close agreement with the findings of Khapare *et al.* (2010) with slight variations.

From the above table it was clearly observed that the highest total bacterial count was found in 60 days sample (22) followed by 40 days sample (15.1) and lower growth was found in 20 days sample (14.38) and in case of coliform and yeast, mold count results were nil for all above storage periods from above all results it could be concluded that fig mango bar is an intermediate moisture food and it has good microbial storage stability over different storage period. These all results are similarly matches with the Parimita and Puneet (2015).

#### SUMMARY AND CONCLUSION

Fruit bar is an intermediate moisture food so it contain about 20 to 40% moisture content hence fig mango bar was microbiologically self stable for different storage periods but due to the long storage period there would be negative effect on sensory quality parameters of fig mango bar.

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