Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

J P P Journal of Pharmacognosy and Phytochemistry

**E-ISSN:** 2278-4136
**P-ISSN:** 2349-8234
JPP 2017; 6(5): 469-471
Received: 20-07-2017
Accepted: 21-08-2017

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# Effect of addition of pectin on textural and sensorial quality characteristics of fig mango bar

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**Abstract**
The objective of this study was to investigate the effect of different levels of pectin on quality characteristics of Fig mango bar. Fig mango bar was prepared using pulp with 32% sugar, 1% acid and 1.5 cm pulp thickness with varying concentration of pectin (i.e. 0.5, 1.0, 1.5 and 2.0%). The prepared mixture was dried at 65–70 ºC in cabinet drier. The products were evaluated for physico-chemical properties and sensorial quality profile. The results revealed that pectin addition negatively effect on the quality characteristics of fig mango bar and not recommended for development of Fig mango fruit bar.

**Keywords**: fruit bar, fig, pectin addition

## 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) [9].

Mango (*Mangifera indica L.*) is one of the most important tropical fruits in the world and currently ranked 5th 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) [8].

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) [2]. 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. Physical properties such as Color of Fruit, Length and Diameter, Weight of Fruit, waste index and Per cent Pulp were measured by selecting ten fully ripened fruits. Moisture content, ash content, crude fiber, total soluble solids (TSS), pH, total carbohydrates were determined by A.O.A.C. (1990) [1]. Total sugars, reducing sugar, Total titratable acidity (as citric acid), ascorbic acid by measured by method given in Ranganna (1995) [7]. The non-reducing sugar was determined by subtracting the value of reducing sugar from the total sugar.

### Preparation of fruit bar
The process of preparation of fruit bar was followed by Prasad (2009) [6]. 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 $P_0$, $P_1$, $P_2$ $P_3$ and $P_4$ 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 $65\pm5^0$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 Dangkrajang *et al.* (2009) [3].

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

**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) [5]. 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 to standardize technology for processing of fig bar. The product was evaluated for their physico-chemical and sensory qualities. Efforts were also made to assess the effect of sugar, acid and pectin on bar quality, textural characteristics of bar.

**Physical-morphological properties of fresh fruits**

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

**Table 1:** Physical characteristics of fresh Fig mango fruits

| Sr. 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 |

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 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 211.12gm,diameter6.25cm,length 8.6cm,and wastage was recorded33.9 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) [10].

**Chemical properties of fresh fruits**

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

| Sr. 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.($^0$Bx) | 18 | 21 |
| 9 | % Titrable acidity | 0.2 | 0.6 |
| 10 | pH | 5.2 | 4.3 |
| 11 | Ascorbic acid(mg/100g) | 12.29 | 18.6 |

*Each value is a mean of three determinations

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/100g of ascorbic acid. And in case of mango fruit moisture content was 82.7%, 0.7%protein, 0.6%, fat, total carbohaydrates 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.

**Effect of addition of pectin on sensory quality of Fig mango Fruit bar**

After standardized sugar and acid ratio the sincere efforts were made to prepare fig bar using different levels of pectin in the pulp. The results are presented in table-3.

**Table 3:** Effect of addition of pectin at different levels on sensory quality of Fig mango Fruit bar

| Sample No. | Color | Taste | Flavor | Mouth feel | Overall acceptability |
|---|---|---|---|---|---|
| FM control | 8.5 | 8.0 | 8.0 | 8.5 | 8 |
| $F_{10}M_{90}$ | 7.0 | 7.5 | 7.5 | 7.0 | 7.0 |
| $F_{20}M_{80}$ | 7.0 | 7.5 | 7.5 | 7.5 | 7.5 |
| $F_{30}M_{70}$ | 7.0 | 6.5 | 6.5 | 6.5 | 6.5 |
| $F_{40}M_{60}$ | 6.5 | 6.5 | 6.0 | 6.5 | 6.5 |
| $F_{50}M_{50}$ | 6.2 | 6.3 | 5.9 | 6.3 | 6.5 |
| SE± | 0.20 | 0.17 | 0.23 | 0.23 | 0.20 |
| CD at 5% | 0.62 | 0.52 | 0.71 | 0.73 | 0.62 |

$F_0$- control, $F_1$- 0.5 % pectin,
$F_2$-1.0 % pectin, $F_3$- 1.5 % pectin $F_4$-2.0 % pectin

It could be observed from table-3 that addition of pectin in each of the pulp resulted in decrease of the score drastically. In each case, with addition of pectin color score has decreased from 8.5 ($F_0$) to 6.5 ($F_4$). With addition of pectin the product showed a dark and dull color as compared to controlled sample and hence most of the judges scored less to pectin added bar than control sample. Similarly taste, flavor, mouth feel and overall acceptability was fig bar drastically reduced with addition of pectin in the bar.

It is interesting to note that addition of pectin in the bar resulted in developing hard non chewable product and also decreased the flavor profile of the product drastically as compared to control sample. The control sample was highly appealing with good natural taste of the fruit and give original desirable chewable texture of the final product.

Similar resulted have been reported by Dangkrajang *et al.* (2009) [3] development of roselle bar from roselle by product. Where it is reported that addition of pectin did not significantly influenced an average liking score of evaluated attribute including color, flavor, sweetness and overall

acceptability.

**Textural qualities of fig mango mix fruit bar**

The mix fruit bar were subjected for measuring textural parameter with respect to share stress (N), tensile force (N), and stickiness (N) using blade Cramer knife, tensile grip and 36/R probe respectively. The results are presented in table 15.

**Table 4:** Textural characteristics of Fig Fruit Bar Individual and mix fruit bar

| Sr. No. | Sample | Parameter | | |
|---|---|---|---|---|
| | | Shear stress (N) | Tensile force (N) | Stickiness (N) |
| | Fig mango mix fruit bite or bar | | | |
| 1 | $F_{10}M_{90}$ | 20.98 | 27.90 | 4.25 |
| 2 | $F_{20}M_{80}$ | 22.10 | 24.66 | 4.23 |
| 3 | $F_{30}M_{70}$ | 24.121 | 23.49 | 4.35 |
| 4 | $F_{40}M_{60}$ | 45.0 | 20.79 | 4.38 |
| 5 | F50M50 | 45.28 | 21.26 | 4.43 |

It is revealed from table-4 that addition of pectin in fig mango bar increased shear stress and tensile force of fig bar, while the stickiness of fig bar decreased with increase in concentration of pectin. Stickiness is undesirable characteristics of bar hence addition of pectin has a desired effect on stickiness. However, shear stress represents hardness of bar and thus the hardness is increased with increase in concentration of pectin which is undesirable. Similarly Tensile force represent elasticity of the process and addition of pectin is increasing the elasticity and chewiness of product which is undesirable. Hence, pectin addition though providing the benefit of reduced stickiness but resulting into increased hardness and chewiness which are undesirable.

**Summery and Conclusion**

It can be concluded that addition of pectin is resulting into undesirable changes and sensorial and textural properties of fig mango bar hence pectin addition is not recommended in preparation of fig mango bar.

**References**


1. AOAC. Official Methods of Analysis, Association of Official Agricultural chemists Washington DC, 1990.
2. Che-man YB, Sin KK Journal of Science and Food Agriculture, 1997; 75:102.
3. Dangkrajang S, Anchalee S, Thongchai S. Asian Journal of Food and Agro-Industry, 2009; 2(04):788-795.
4. Khapre AP. Studies on preparation of fig (*Ficus caraca* L.) fruit powder and its utilization in various value added products. A thesis submitted to M. A. U, Parbhani for degree of M. Tech. (Food Sci), 2010.
5. Panse VG, Sukhatme PV. Statistical Methods for Agricultural Workers, I.C.A.R, New Delhi, 1978, 1-22.
6. Prasad K. Agricultural Engineering International: the CIGR Journal. 2009; 1390(11): 1.
7. Ranganna S. Handbook of analysis and quality control for fruit and vegetable products. Second Edition. Tata Mc-Graw Hill Pub. Co. Ltd., New Delhi, 1995.
8. Sakhale BK, Chalwad RU, Pawar VD. Standardization of process for preparation of fig-mango mixed toffee. International Food Research Journal, 2012; 19(3):889-891.
9. Venu DK, Munjal SV, Waskar DP, Patil SR, Kale AA. Journal of Food Science and Technology, 2005; 42 (3):279.
10. Waskar DP, Gawade MH, Masalkar SD. Indian Food Packer, 2003; 57(6):153.