

Shelf-life studies on raw jack-fruit pith pickle

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SUMMARY : A study was conducted to develop shelf-stable jack-fruit pith pickle. The composition of the pickle consisted of jackfruit pith, vinegar, salt, oil, spices and condiments. The ingredients used were optimized with regard to pH, saltiness, taste and flavour. Data were collected on physico-chemical, microbial and sensory characteristics. The product was found acceptable and microbiologically safe under ambient conditions up to 6 months of storage period.

KEY WORDS : Jack fruit pith, Shelf-stable, Microbial quality, Sensory evaluation

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Preservation of food products by pickling is a traditional method practiced since time immemorial. Pickled products are common in Indian dietary and are much relished by the Indian population. They are generally used as adjuncts along with bland foods like rice, roti, chappathi etc.

In recent years many processes have been developed for standardizing various products of jack-fruit. Jack-fruit bulbs were processed by osmotic concentration (Saxena *et al.*, 2009). Jack-fruit pappads from SRS 33, SRS 26 and SRS 7 varieties were standardized by Jagadeesh *et al.* (2009). They also identified suitable varieties for high quality chips. John *et al.*, (1993) standardized ready to eat raw jack-fruit curry in flexible pouches. Jack-fruit flour characteristics were analyzed by Odemelam (2005).

Though Jack-fruit pith has good sensory attributes its scope in processing is an unexplored area. This work was initiated with the objective to develop a shelf-stable pickle with Jack-fruit pith storable upto 6 months.

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EXPERIMENTAL METHODS

Pith of raw jack-fruit (45-48 days of age) were cut into pieces of 1" to 1.5" size. Salt @ 100 g/kg was mixed and marinated for 2 days. Appropriate changes in the composition of spices and condiments were made to optimize the product with regard to acidity, saltiness and flavour. Thus the standardized recipe was developed as follows:

Ground ginger (60g), garlic (60g), green chilies (10g) was sauted in gingelly oil (30 ml) for 10 minutes until the raw flavour disappeared. Along with it chilly powder (50g), fenugreek powder (10g), asafoetida powder (10g) and crushed mustard (30g) were also blended into the marinated jack-fruit pith after mild heating. Vinegar @ 200 ml / kg was added and finally gingelly oil (200 ml/kg) was heated to 60°C followed by cooling and poured over the marinated jack-fruit pith mix.

The product was stored at room temperature (28-38°C) for a period of 6 months. Analysis of the product was carried out at regular intervals for physico-chemical and sensory evaluations till the end of storage period. Standard procedures were followed for chemical (AOAC, 1984) and microbial analysis (Compendium of Methods for Microbiological Examination of Foods- APHA, 1976).

Sensory analysis was carried out by 25 semi-trained panel members (Botha and Shaw, 1975).

EXPERIMENTAL FINDINGS AND ANALYSIS

The experimental results are presented in Table 1, 2 and

Table 1 : Chemical changes during storage of shelf-stable jack fruit pith pickle at ambient temperature (28-38°C)

	Storage period (months)						
	0	1	2	3	4	5	6
Moisture %	73.8	74.1	71.3	70.5	68.9	68.1	67.2
Fat %	15.2	14.7	14.1	13.9	13.5	13.2	12.9
pH	2.4	2.4	2.5	2.6	2.6	2.7	2.7
Salt	13.3	13.5	13.7	13.9	14.2	14.8	15.2
acidity	1.68	1.72	1.75	1.82	1.98	2.09	2.10

Table 2 : Sensory evaluation of shelf-stable jack fruit pith pickle during storage

Quality attributes	Storage period, months						
	0	1	2	3	4	5	6
Colour and appearance	4.88	4.92	5.0	4.76	4.81	4.23	4.16
Flavour	4.96	4.75	4.62	4.53	3.98	4.23	4.18
Taste	4.6	4.80	4.76	4.56	4.86	4.66	4.52
Texture	4.91	4.12	4.31	4.19	4.51	4.47	4.32
Overall acceptability	4.83	4.64	4.67	4.56	4.54	4.39	4.29

*Very good – 5, good – 4, fair- 3, satisfactory – 2, poor – 1.

Table 3 : Microbial quality of shelf-stable jack fruit pith pickle during ambient temperature (28.38°C) storage

Microbial counts/g ($\times 10^{-7}$)	Storage period, months						
	0	1	2	3	4	5	6
Total plate count							
Bacteria	7.8	7.4	6.1	5.2	4.3	4.9	4.2
Fungus	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Actinomycets	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Coliforms	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Salmonella	Nil	Nil	Nil	Nil	Nil	Nil	Nil
S. aureus	Nil	Nil	Nil	Nil	Nil	Nil	Nil

3. The moisture content of the jack-fruit pith pickle decreased to 67.2 per cent from the initial value of 73.8 per cent and fat from 15.2 per cent to 12.9 per cent. The pH increased from 2.4 to 2.7 and salt content from 13.3 per cent to 15.2 per cent during the course of the storage. Similarly acidity of the pickle increased to 2.10 from 1.68 (Table 1).

Sensory evaluation of the product showed that the product was acceptable even at the end of 6 months of storage (Table 2).

Microbial studies revealed that the product was free from coliforms, *Salmonella*, *S.aureus* during the storage period. The total plate counts were within the permissible limits (Table 3).

The product was microbiologically safe and acceptable from the point of sensory properties and can also be marketed

even after a storage period of 6 months.

Conclusion :

All the parts of jackfruit has proved to be of value in processing. The pith of the fruit, which was so far discarded or used rarely as cattle feed has thus, proved to be a promising raw material for pickle making.

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