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## Studies on development and evaluation of guava-papaya chutney

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### Abstract

Guava-Papaya chutney was developed and evaluated for changes in its physico-chemical, microbiological and sensory parameters at monthly interval for three months storage period. Total soluble solids increased significantly, while acidity decreased significantly in guava-papaya chutney with the advancement in storage period. Yeast and mold count increased significantly in chutney during storage. The scores for colour and appearance, flavour, taste, mouthfeel and overall acceptability in guava-papaya chutney decreased significantly during storage, however, the product was found acceptable even at three months storage. Chutney prepared with 40 guava:60 papaya pulp ratio was found the most acceptable.

**Keywords:** Guava, papaya, chutney, physico-chemical, microbiological, sensory, parameter, storage

### Introduction

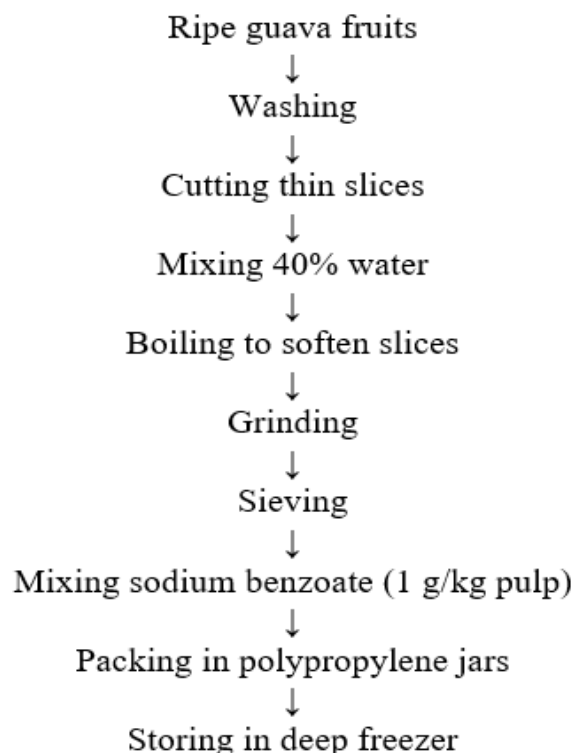
Guava (*Psidium guajava* L.) is one of the important commercial fruits that belong to family Myrtaceae. It is native to tropical America and is presently found in many tropical and subtropical countries. It is popularly known as “poor man’s apple” and is a good source of dietary fibre. Guava is very rich in minerals viz., iron, phosphorus and calcium, and is a good source of ascorbic acid, dietary fibre, carotenoids, phenolic compounds, sugars, pectin and lipids. It is a climacteric fruit, which ripens rapidly after harvest, and loses its texture and quality in 3-4 days at room temperature. It contains a high percentage of its fresh weight as water and consequently exhibits relatively high metabolic activity, which continues after harvest and makes it highly perishable commodity. It is also known for anticancer properties. Papaya (*Carica papaya* L.) belongs to family Caricaceae. Owing to high nutritive value and reasonable price, it is popularly called as common man’s fruit. The fruits are rich in minerals like potassium, magnesium and folate, vitamins like vitamin A, C, E and some B group vitamins, flavonoids,  $\beta$ - carotene and fibre (Ramachandran & Nagarajan, 2014) [4]. It is also regarded as “the wonder fruit of the tropics and subtropics”. It has anti-inflammatory, anti-tumour, anti-fungal, anti-bacterial and wound healing medicinal properties (Aravind *et al.*, 2013) [1].

The latex and juice of fruit aid in dyspepsia, intestinal irritation, habitual constipation and chronic diarrhoea. Papaya fruit is utilized by various researchers in developing ready-to-serve drink, nectar, squash, sherbet, jam and candy slices to avoid extra glut during peak season.

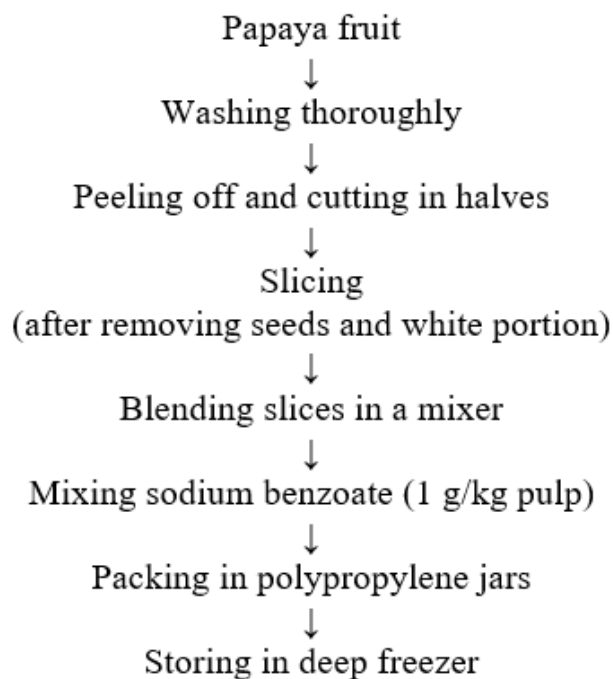
Blending of papaya pulp with guava pulp can supplement its blended products with vitamins, especially vitamin A, minerals, besides improving its Colour and appearance, taste, flavour and overall acceptability. Keeping the above aspects in view, the present research work was planned to standardize appropriate combination of guava-papaya blend for preparation of chutney and to evaluate the storage quality of blended product.

### Materials and Methods

The present investigation was carried out in CFST, CCSHAU, Hisar during 2018-19. Ripe guava fruits cv. Hisar Safeda were procured from Experimental Orchard of Department of Horticulture, CCSHAU, Hisar and ripe papaya fruits were procured from local market, Hisar for collecting pulp to prepare chutney from guava-papaya blends.



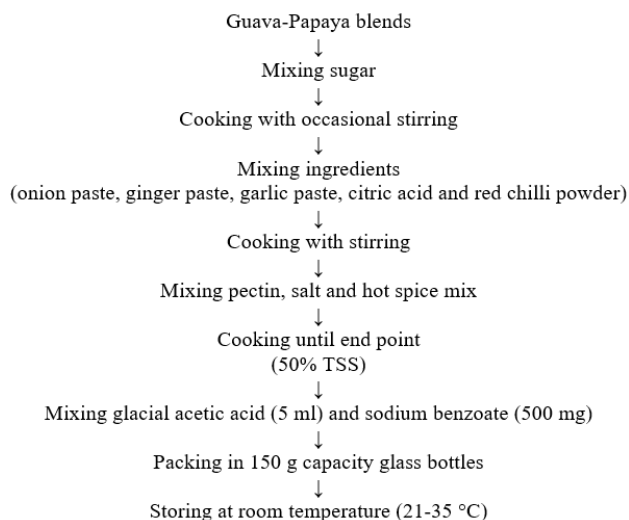
**Fig 1:** Flow sheet for collection of pulp from guava fruits



**Fig 2:** Flow sheet for collection of pulp from papaya fruits

Guava-Papaya jam was prepared from guava-papaya blends (100:0, 80:20, 60:40, 40:60, 20:80 and 0:100) as per standard procedure (Fig. 3). One kg blended pulp, 650 to 700 g sugar, 4.0 to 5.0 g citric acid and 1.0 to 2.0 g pectin were used for preparation of guava-papaya jam. The mixture of pulp, sugar and citric acid was cooked with a ladle with constant stirring to obtain desired consistency. Pectin dissolved in lukewarm water was then mixed with the cooking mass. The end point was judged by sheet test and total soluble solids (68%) were measured using hand refractometer (58-92%). The product was packed in 150 g capacity sterilized glass bottles and

stored at room temperature for analyzing its sensory quality. Based on sensory evaluation of all the blended products, guava-papaya jam (100:0, 40:60, 0:100) were selected for further analysis for changes in chemical constituents and overall acceptability at monthly interval during three months storage period.



**Fig 3:** Flow sheet for preparation of guava-papaya jam

Based on sensory evaluation of blended products, guava-papaya chutney (100:0, 40:60 and 0:100) were selected for changes in physico-chemical, microbiological, sensory at monthly interval during three months storage period.

Total soluble solids (TSS) were estimated at ambient temperature by hand refractometer (28-62%). Acidity was analyzed according to methods described by Ranganna (2014) [5]. Serial dilution technique and pour plate method were used to enumerate the microbial load *i.e.*, yeast and mold count ( $\log_{10}$  cfu/g). The colonies were counted after incubation period.

The overall acceptability of guava-papaya chutney was based on mean scores obtained for all the sensory characters *i.e.*, colour and appearance, flavour, taste and mouthfeel. The characters with mean scores 6 and above out of 9 were considered acceptable (Ranganna, 2014) [5]. The treatments were replicated thrice and the data were analyzed statistically using completely randomized design. The critical difference value at 5 per cent level was used for making comparison among different treatments during storage.

### Results and Discussion

The data presented in Table 1 show an increasing trend in total soluble solids of guava-papaya chutney during storage. The increase in total soluble solids of guava-papaya chutney might be due to acid hydrolysis of insoluble polysaccharides, especially gums and pectin, and its conversion into soluble sugars. The results are in accordance with the observations of Safdar *et al.* (2014) [6] in guava leather and Ullah *et al.* (2018) [9] in carrot and apple blended jam. Acidity decreased significantly in guava-papaya chutney during three months storage. The decrease in acidity might be attributed to hydrolysis of polysaccharides and non-reducing sugar, where acid is utilized for converting these to hexose sugars (reducing sugars) or complexing in the presence of metal ions. Similar observations were reported by Thakur (2017) [8] in wild pomegranate chutney. There was significant increase in yeast and mold count of guava-papaya chutney during storage

period. This could be explained due to the differences in physico-chemical composition among various treatments and changes in the physico-chemical composition of the products during storage duration. The results are similar to those of Chaudhary and Verma (2012)<sup>[3]</sup> in aonla chutney and Bafna and Manimehalai (2013)<sup>[2]</sup> in kokum jam.

There was significant decrease in scores for colour and appearance, flavour, taste, mouthfeel and overall acceptability of guava-papaya chutney during storage period. This could be

attributed to changes in chemical constituents or certain enzymatic and non-enzymatic changes in the products. However, organoleptic score of the products remained above the acceptable level even at the end of three months storage. The decrement in sensory scores during storage was also observed by Veerapandian *et al.* (2014)<sup>[10]</sup> in ready-to-eat peanut chutney and Ullah *et al.* (2018)<sup>[9]</sup> in carrot and apple blended jam.

**Table 1:** Effect of storage on physico-chemical, microbiological and sensory parameters of guava-papaya chutney

Treatments* Guava: Papaya	Storage period (months)	Total soluble solids (%)	Acidity (%)	Yeast and mold count (log <sub>10</sub> cfu/g)	Colour and appearance (score out of 9)	Flavour (score out of 9)	Taste (score out of 9)	Mouthfeel (score out of 9)	Overall acceptability (score out of 9)
100:0	0	50.00	0.78	-	7.60	7.70	7.70	7.60	7.60
	1	50.17	0.76	-	7.50	7.50	7.50	7.35	7.44
	2	50.37	0.73	2.47	7.50	7.40	7.40	7.15	7.34
	3	50.75	0.71	2.95	7.30	7.20	7.20	7.10	7.18
40:60	0	50.00	0.69	-	8.50	8.70	8.70	8.55	8.51
	1	50.21	0.67	-	8.40	8.60	8.60	8.40	8.36
	2	50.42	0.64	2.30	8.30	8.40	8.40	8.15	8.21
	3	50.84	0.61	2.85	8.10	8.20	8.20	8.00	8.05
0:100	0	50.00	0.63	-	8.80	8.10	8.50	8.40	8.45
	1	50.23	0.60	-	8.70	8.00	8.30	8.20	8.31
	2	50.44	0.58	2.18	8.50	7.80	8.20	8.10	8.15
	3	50.93	0.56	2.78	8.20	7.70	8.00	7.90	7.96
CD at 5%	Treatment	0.01	0.01	-	0.05	0.06	0.06	0.05	0.04
	Storage	0.01	0.02	-	0.06	0.07	0.07	0.06	0.05
Treatment x Storage		0.02	0.03	-	0.11	NS	NS	NS	NS

\*Recipe- One kg blended pulp; 400 g sugar; 1 to 2 g citric acid; 200 g onion paste; 20 g ginger paste; 10 g garlic paste; 2.5 g red chilli powder; 2 g pectin; 25 g salt; 8 g hot spice mix and 5 ml glacial acetic acid, NS-Non-significant

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