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RESEARCH ARTICLE

PREPARATION OF VANILLA FLAVORED PAPAYA SYRUP.

Rihana H[1], Lubna[1], Shravya K[1], Jhansi A[1] and Bhasker Vellanki[2].

1. M. Tech Food Technology, Dept. of Food Technology, Osmania University, Hyderabad.
2. Faculty, Dept of Food Technology, Osmania University, Hyderabad.

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Abstract

Papaya is a wholesome fruit containing a wide range of nutrients which has several beneficial effects on human health. Since papayas are climacteric fruit, it is prone to respiratory changes after harvest and has a short shelf life. The complicated peeling limits the consumption of the fruit among people. Thus, processing of papaya into various products is essential to preserve the fruit and increase the consumption. Preparation of syrup from the fresh fruit can help in increasing the consumption and reduce the rate of fruit spoilage which leads to wastage of such rich nutritious fruit. To the syrup, vanilla flavored essence was added to increase the acceptability among children. The syrup can be utilized in various ways as it binds with various food varieties than jams and other commercial products that have utilization limitations. Quality analysis and proximate studies were performed. The syrup is found to have 35.6% carbohydrates, 1.67% fiber, 0.86% protein and 0.51% ash content. The syrup is found to be stable for over 45 days under refrigeration. Thus, the production of vanilla flavored syrup not only increases the shelf life but also aids in promoting the rate of consumption among all age groups.

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Introduction: -

Papaya (Carica papaya) is commonly called as paw-paw and it belongs to the family Caricaceae. Papaya is popularly known for its food and nutritional values throughout the world. The fruit and other parts of the papaya plant are also well known in the traditional system of medicine (Saran, and Choudhary, 2014).). The biological activity and medicinal application of papaya are widely studied and is considered as a valuable nutraceutical plant (Krishan, *et al.*, 2008). Papaya contains excellent medicinal properties for the treatment of different ailments. The leaves, seeds, latex, and fruit of the papaya plant possess good medicinal value (Sudhakar, and Theivanai Vidhya, 2014) The stem, leaf, and fruit of papaya contain plenty of latex. The latex from unripe papaya contains several unique protein-digesting enzymes including *papain* and *chymopapain* (Devaki, *et al.*, 2015). These enzymes help in reducing inflammation and aids in healing burns. The papain is a digestive enzyme that helps in natural digestion. Papaya is an excellent source of nutrients namely carotenes, vitamin C, flavonoids, B vitamins including folate and pantothenic acid, minerals such as potassium and magnesium and dietary fibre and phytochemicals (Murcia *et al*., 2001; Leong and Shui, 2002, Gopalan *et al.*, 2004). Besides consumption as a fresh fruit, several processed products from papaya are developed in the form of puree, jam, jelly, pickle, candied fruit, blended beverages, canned slices/ chunks, concentrate, fermented juices, dried products, minimally processed products and by-products on a commercial scale (Devaki, *et al.*, 2015). The functional components of the papaya such as pectin content of the fruit

Corresponding Author:-Basker Vellanki.
Address:-Faculty, Dept. of Food Technology, Osmania University, Hyderabad.

aids in the preparation of many processed products such as jams and jellies. Papaya products developed by research with low sweetness has proved its importance in reducing the blood sugar levels. The phytochemical constituents of the fruit have anti-cancer, anti-inflammatory and antimicrobial characteristics. The bioavailability of carotenoids from papaya is higher compared with other fruits which helps in overcoming vitamin A deficiencies.
Papaya is less utilized because of the difficulties faced in complicated peeling and dicing (Almeida *et al.*, 2014). Thus, transformation of the nutrients and taste of the fruit into much better product would help the consumers consume the highly nutritious fruit effectively.
Thus, to increase the utilization of the papaya and to reduce the wastage of the cultivated fruit which goes bad during delayed and improper transportation and storage, production of quick, easy and economical product is required. The processing conditions need to be favorable and easily available throughout and the product should also be widely liked and consumed. Thus, the preparation of papaya in syrup form seems to be an ideal product capable of meeting all the demands. Addition of vanilla based essence to the syrup is likely to improve the consumption among children and among those who dislike papaya flavor
Thus, the main objective of the study is to prepare a syrup-based papaya product and to carry out proximate analysis, sensory evaluation and shelf life studies followed by comparison of the data with commercially available papaya-based product. This would aid in better selection and utilization of suitable products by the consumers.

Materials and methods: -

Materials:

The raw material, mature and ripe papaya *(Carica papaya*) was obtained from a local vegetable market in Hyderabad. Sugar and Vanilla essence required for preparation of syrup were obtained from a local supermarket in Hyderabad.

Heating mantle, saucepan, and stirrer were used for the preparation of product.
Sulphuric acid, Sodium hydroxide, Boric acid, Potassium sulphate, Copper sulphate, and Selenium powder were procured from M/s Sigma Aldrich for the estimation of protein content in the product by Kjeldahl method.

Soxhlet apparatus, hot air oven, muffle furnace was used for estimation of fat, moisture, and ash content in the product respectively.

Methodology:

Trial 1:

Papaya was peeled, deseeded and cut into cubes of equal size. One cup of cut cubes (140g) was taken in a mixer grinder. The cubes were ground to a fine paste and was transferred to a saucepan placed in a heating mantle which was set at 80˚C. To the papaya paste, sugar-½ cup (113 g) and water-¼ cup (59 mL), was added and mixed smoothly. The mixture was allowed to boil, and temperature was brought down to 50º. The mixture was stirred for 10 minutes at 50ºC until glazy syrupy consistency is attained. To the syrup, vanilla essence 1/8 teaspoon (12 drops) was added and stirred for 1 minute and removed from heat. The papaya vanilla syrup was cooled and refrigerated for further analysis.

Trial 2:

Papaya was peeled, deseeded and cut into cubes of equal size. One cup of cut cubes (140g) was taken in a mixer grinder. The cubes were ground to a fine paste and was transferred to a saucepan placed in a heating mantle which was set at 80˚C. To the papaya paste, sugar- ¼ cup (57 g) and water- 1/3 cup (79 mL), was added and mixed smoothly. The mixture was allowed to boil, and temperature was brought down to 50º. The mixture was stirred for 10 minutes at 50ºC until glazy syrupy consistency is attained. To the syrup, vanilla essence was 1/16 teaspoon (6 drops) was added and stirred for 1 minute and removed from heat. The papaya vanilla syrup was cooled and refrigerated for further analysis.

Sensory evaluation:

Sensory analysis is a scientific method used to evoke, measure, analyze and interpret reactions with those characteristics of food and materials as they are perceived by senses of the sight, smell, taste, touch, and hearing. An organoleptic evaluation of the product was done for appearance, color, flavor, consistency, taste and overall acceptability. All the samples were displayed to the semi-trained panel members under ambient conditions for sensory evaluation, to bring out the inherent characteristics of the product using 9-point hedonic scale.

Papaya vanilla syrup obtained from two trials were displayed and sensory evaluation was carried out. The proximate analysis was carried out for the sample with best score.

Proximate analysis:

Moisture content. The moisture content of the syrup was calculated using hot air oven method (AOAC,1990) at 105˚C until a constant weight was achieved.

Protein. The protein content of the syrup was determined by Kjeldahl method (AOAC,1990).

Fat. Fat content of the syrup was determined using Soxhlet method (AOAC,1990) with hexane as a solvent.

Ash. Ash content of the syrup was determined by dry ashing method in muffle furnace maintained at 600ºC for 6 hours.

Crude fiber. Crude fiber present in syrup was calculated by Weende method (AOAC,1990).

Results and discussion: -

Sensory evaluation:

The results of sensory evaluation and proximate analysis of papaya vanilla syrup is given in Table 1 and Table 2.

Table 1:-Sensory evaluation of papaya vanilla syrup

Parameters	Trial 1	Hedonic points	Trial 2	Hedonic points
Color	Brownish orange	7	Dark orange	9
Flavor	Distinct papaya and vanilla flavor	8	Distinct papaya and vanilla flavor	9
Texture	Slightly thick and smooth	8	Smooth with good thickness	8
Taste	Very sweet	6	Acceptable sweetness	8

The consistency of the syrup achieved from trial 1 was slightly thicker probably due to less water which was undesirable. The Color of the product obtained from trial 1 was brownish orange probably due to increased browning of sugar since it had more sugar added to it when compared to trial 2. This resulted in a syrup with increased sweetness which masked the original papaya flavor. These drawbacks were taken into consideration in the next trial and the amount of sugar was reduced and water was increased. The obtained product was rated good in sensory evaluation and was highly accepted. Thus, the composition used in trial 2 was taken as standard value for the preparation of papaya vanilla syrup.

Proximate composition:-

Table 2:-Proximate composition of papaya vanilla syrup

PARAMETERS	PERCENTAGE (%)
Moisture	63.03
Total carbohydrates Sugars Fiber	35.6 33.1 1.67
Protein	0.86
Ash	0.51
Fat	0

The proximate composition of papaya vanilla syrup is in table 2. The moisture content of papaya syrup is higher when compared to other papaya-based products such as jams and jellies but lower when compared to fresh pulp. The low viscous papaya syrup helps in better utilization in various food products as well. There is a reduction of up to 20% in moisture content of fresh papaya pulp (Mahomud, 2008) thus aiding shelf life extension with minimal processing. The total carbohydrate content in papaya syrup is higher to about 20% than the fresh papaya fruit but this is lower when compared with commercially available candies (Kumar, 1952) and jams (Lal, and Das, 1956) which has 10-15% higher carbohydrates than papaya vanilla syrup. The proportion of sugar added for the preparation of jelly (Yi-zhuo, Ling-wen, Qing-xin, 2013) is same as that for papaya vanilla syrup but since a clear juice was required it was filtered which resulted in exclusion of fibers. The fiber, protein and ash content are found to be similar when compared with commercial papaya products. The syrup can be utilized in many different ways

with many different food combinations which makes it one of the best ways to reproduce the health benefits, taste, and flavor of papaya. This, in turn, helps to reduce the wastage and utilize the cultivated fruit effectively. The processing of the syrup is very economical, utilizing less additional ingredients when compared with other commercially available papaya-based products.

Shelf life studies:
Storage quality is an important parameter of concern in utilization of fruits. Various factors determine the shelf life of commodities such as inherent composition, environment of storage, method of processing and packaging material.

Samples were stored for different periods of time under various controlled conditions. The sample was observed for organoleptic changes like flavor, aroma, and texture. This was periodically undergone for every 24 hours

The sample was stable for about than 45 days under refrigeration. The product slightly increased in thickness with time due to refrigeration but the color and flavor was unaltered and unaffected.

The sample was stable for a week at room temperature but thereafter visible fungal growth occurred. Thus, for longer life refrigeration is the best method of storage with good packaging.

Conclusion: -

Thus, preparation of papaya in syrup form seemed to be an ideal product meeting all the demands. To improve the consumption among children and among those who disliked papaya flavor addition of vanilla based essence to the syrup proved to be successful. This provided a good balance between papaya and vanilla flavor which was liked by majority of the people involved in sensory evaluation.

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