

Original Research Article

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Development of Jam from Under Exploited Fruit Aliv (*Meyna laxiflora* Robyns)

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ABSTRACT

Keywords

Antioxidants,
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Aliv fruit jam was developed in the present study. The finding of this study shows that the developed product of aliv jam has maximum consumer acceptance, due to its highly antioxidant activity and taste. A new formulated Alivfruit jam was prepared and biological, chemical and physical analysis was performed. The product were also tested for sensory properties and it was found good. The developed aliv fruit jam was packed in glass jar and stored at a temperature of $25 \pm 1.5^{\circ}\text{C}$. A significant increase in pH was observed in aliv fruit jam during storage. A significant decrease in T.S.S. during storage of jam. No significant effect of packaging material was found on pH and T.S.S. of developed product. Based on the high overall acceptability scores and acceptable T.S.S. and pH. Aliv fruit jam developed and packed in glass jars was highly acceptable up to 3 month by consumer. Sensory evaluation of aliv jam was carried out sample S₃ observed highest score followed by S₂, and S₁. The sample scored higher for appearance followed by S₁& S₂. The taste of sample significantly affected with addition of fresh aliv pulp.

Introduction

Meyna laxiflora Robyns. Family Rubiaceae commonly known as manakkarai (Tamil), muyna, muduna (Hindi, Bengali) and gobergally (Kannada) is a spinescent or unarmed shrub or a small tree found in Western UP, West Bengal, North-east India and Deccan peninsula. Leaves are ovate to elliptic; flowers in lax cymes, greenish white; drupes are subglobose, green to brown. Seeds are albuminous with a membranous testa. Different parts of the plant were used in the

treatment of boils, dysentery, diphtheria etc. Antioxidant activity of the *Meynalaxiflora* fruit pulp has already been reported. Free radicals are generated as part of the body's normal metabolic process and play a dual role in our body as both deleterious and beneficial species. Excess production of reactive oxygen species (ROS) and a decrease in antioxidant levels, this may leads tissue damage and causes different diseases. Antioxidant plays a major role to protect our body from disease by reducing the oxidative damage to cellular component caused by ROS. Recent

investigations suggest that the plant origin antioxidants with free-radical scavenging properties may have great therapeutic importance in free radical mediated diseases like diabetes, cancer, neurodegenerative disease, cardiovascular diseases, aging, gastrointestinal diseases, arthritis and aging process. Many synthetic antioxidant compounds have shown toxic and mutagenic effects, relatively plant based medicine confer less side effect than the synthetic drug. Several investigations showed that seeds of various fruits are an important source of natural antioxidant. In view of the above observation our interest was to find out natural antioxidant from seeds of *Meynalaxiflora* using in vitro antioxidant activity. A scientific study of wild fruits is important for the potential sources which could be utilized at the time of scarcity or during normal days or cultivated as a source of food material for an ever increasing population. Fruits have satisfactory edible proteins with high quality so that we can use them in food industries and as nutrition. Fruits are generally high in fiber, water, vitamin C and sugars. From ancient time edible wild fruits played a very vital part in supplementing the diet of the people. The fruit contain Nitrogen (0.44 ± 0.004), Phosphorus (0.15 ± 0.004), Calcium (325.10 ± 0.066), Potassium (1278.00 ± 2.6), Magnesium (99.5 ± 0.90), Iron (35.55 ± 0.47), Manganese (0.94 ± 0.04), Zinc (5.21 ± 0.09), Copper (0.84 ± 0.03), and Sodium (221.00 ± 1.70), Oxalate (0.8667 ± 0.1527), Phytate (0.2667 ± 0.0577), Tannin(1.06 ± 0.0529), and Saponin (53.366 ± 0.472) mg/100gm. Fruits and vegetables are the fundamental and vital elements in the human diet. They make a significant nutritional contribution to human's diet due to their high nutritional value. They are the best source of vitamin A and C, considered as protective foods and are not much expensive. Fruits are not only consumed as fresh, but are also processed in the form of products. With the advances in food science and technology,

processing and preservation have ensured maximum utilization of C and D grade fruits, including deformed, de-shaped, underdeveloped for the utilization and converting them into valuable food products. It is also very economical to preserve seasonal fruits to prepare different fruit products when they are in glut season and sold at throw away prices. Fruits can be processed in different ways. Their pulp can be preserved to prepare squash, jams, purees, etc. It has now become more important for food technologists not only to process the fruits and vegetable into valuable food products, but also to guide the consumers to select these food products according to new concepts of blood group to remain healthy and prevent diseases.

Materials and Methods

Preparation of Aliv pulp

The fresh aliv fruits were purchased from mahad, Maharashtra. The blanching of fruits was done to remove the physical and chemical contamination from fruits surface. The fruit was sliced in two part longitudinally to remove the seed and then it grind with some others ingredients to make jam.

Physicochemical parameters of developed aliv jam

The physicochemical parameters (T.S.S, pH, moisture and acidity) of product was measured for 90 days at interval of 30 days. pH was checked by using pH meter and moisture content (%), acidity was calculated by formula and T.S.S. was checked by using hand refractometer.

Moisture (%)

The sample was dried in drier at 65°C and initial and final weight was recorded by weighing balance.

$$(\%) \text{ moisture} = \frac{\text{Final value} - \text{initial value}}{\text{Initial value}} \times 100$$

Acidity (%)

Ten grams of homogenized sample was taken and made up to 100-ml. volume in a volumetric flask. The contents were then filtered through Whatman No.1 filter paper; an aliquot of 1 ml. was taken for titration against 0.1 N NaOH using phenolphthalein indicator and light pink colour as end point, to estimate titrable acidity in terms of tartaric acid (AOAC, 1995).

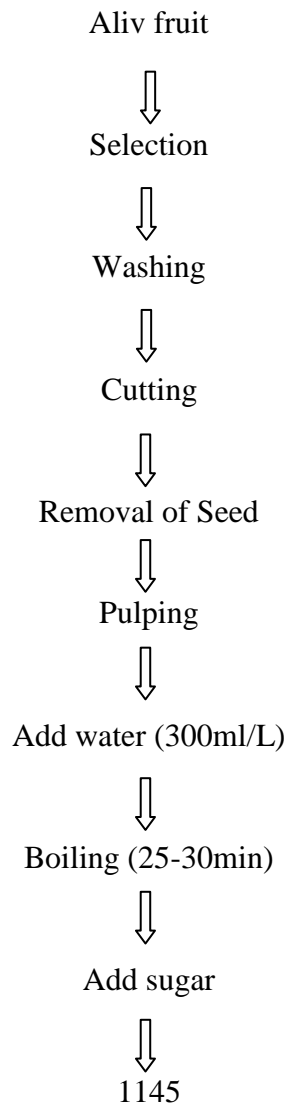
Total soluble solids (^oBrix)

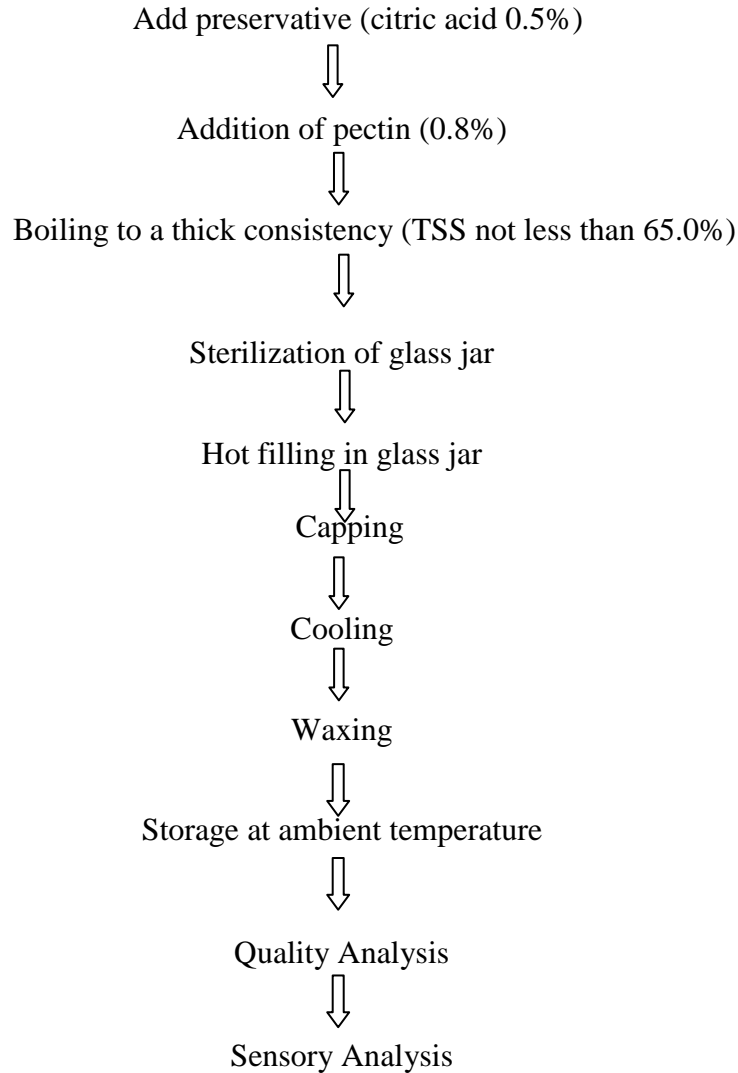
The percentage of total soluble solids was determined using ERMA hand refractometer by placing a drop of the filtered juice on the refractometer prism. Before taking the reading, the refractometer was tested for error with distilled water (Ranganna, 1986).

Sensory evaluation

It was done using the 9 points hedonic score as given by Ranganna (2000).

Flow Chart for Preparation of Aliv Fruit Jam





Results and Discussion

Sensory analysis

The aliv were blended in the three sample of Aliv jam was made by blended of ingredients in different proportion see in table 1. The experiment was replicated 3 times and total 3 samples of jam were prepared and served to semi trained and trained panellists to judge the attributes. The samples were scored for their attributes such as colour, flavour, taste, appearance and overall acceptability and their mean was calculated and is given in table 1. The overall acceptability of sample S_3 was better than rest of the samples (sample- S_1 , S_2)

due to cost of production for this sample ' S_1 ' is very low and overall acceptance of this sample is better or slightly similar to the sample ' S_2 '. Hence we discussed and concluded that the product is available to the consumer in affordable price and the production cost for making this highly nutritious product is low. Since the product satisfy the wants of both i.e. producer and consumer. Therefore we select the sample ' S_3 ' for the large quantity production (Fig. 1).

Preparation of jam from aliv blend

The jam was prepared from the blend of aliv pulp as per Fruit Product Order, 1955

specifications. That is TSS 65 Brix, acidity 0.46% and pH 3.1 to 3.7. The pulps were blended in different ratios as described in table 2.

With the help of 10 panellist samples was evaluated and sample S3 was found most acceptable by panellist. Best blended jam was selected by the organoleptic evaluation which was conducted on 9 point hedonic scale for colour, appearance, taste, flavour and overall acceptability by 10 semi trained panellist or judges having prior experience of sensory evolution of fruits and vegetable product.

Chemical analysis of Aliv fruit

The data obtained on chemical properties such as acidity, moisture content, fat, ash, protein, carbohydrate and minerals for sample were recorded after the preparation on 0th day and final value were as taken as given in table 3.

Chemical analysis of jam

The data obtained on chemical properties such as acidity, moisture content, fat, ash, protein and carbohydrate for sample 3 were recorded after the preparation on 0th day and final value were as taken as given in table 4.

Table.1 Sensory parameters (marks according to 9 point Hedonic scale) of Aliv jam

Sensory quality attributes and aliv jam samples	Sensory scale factors on 9- point scale		
	Fair	Medium	Good
Appearance			
Sample 1	6.39	6.61	6.80
Sample 2	6.43	6.82	7.00
Sample 3	7.31	7.56	8.10
Color			
Sample 1	5.11	6.26	6.60
Sample 2	5.72	6.96	7.00
Sample 3	6.46	7.06	7.22
Texture			
Sample 1	5.22	5.34	6.60
Sample 2	5.70	7.00	7.02
Sample 3	6.10	7.36	8.00
Taste			
Sample 1	5.31	5.50	6.00
Sample 2	5.21	6.46	6.83
Sample 3	7.02	7.33	8.20
Overall acceptability			
Sample 1	5.11	5.76	6.08
Sample 2	5.31	6.56	7.14
Sample 3	7.11	7.42	8.02

Table.2 Variation of jam samples

Ingredients	Control (g)	S1 (g)	S2 (g)	S3 (g)
Fruit pulp	60	55	50	45
Sugar	35	40	45	50
Citric acid	0.5	2	2	2
Pectin	0.8	1	1	1

Table.3 Nutritional composition of Aliv fruit

Sr. No.	Parameters	Quantity/100gm
1	Moisture	74%
2	Fat	< 0.1g
3	Ash	0.38g
4	Protein	0.48g
5	Carbohydrate	25.1g
6	Acidity	0.3%

Table.4 Nutritional value of aliv jam

Sr. No.	Parameters	Quantity / 100gm
1	Moisture	20.5%
2	Fat	< 0.1g
3	Ash	0.62g
4	Protein	0.39g
5	Carbohydrate	78.1g
6	Acidity	0.46%

Table.5 Effect on pH, acidity, moisture and TSS of jam during storage

Parameter	0day	30 th day	60 th day	90 th day	Mean
pH	3.1	3.3	3.4	3.7	3.37
Acidity	0.46	0.49	0.49	0.51	0.48
Moisture	20.5	20.5	20.9	20.1	20.5
TSS	66	66	65.5	65.5	65.75

Fig.1 Sensory analysis of jam

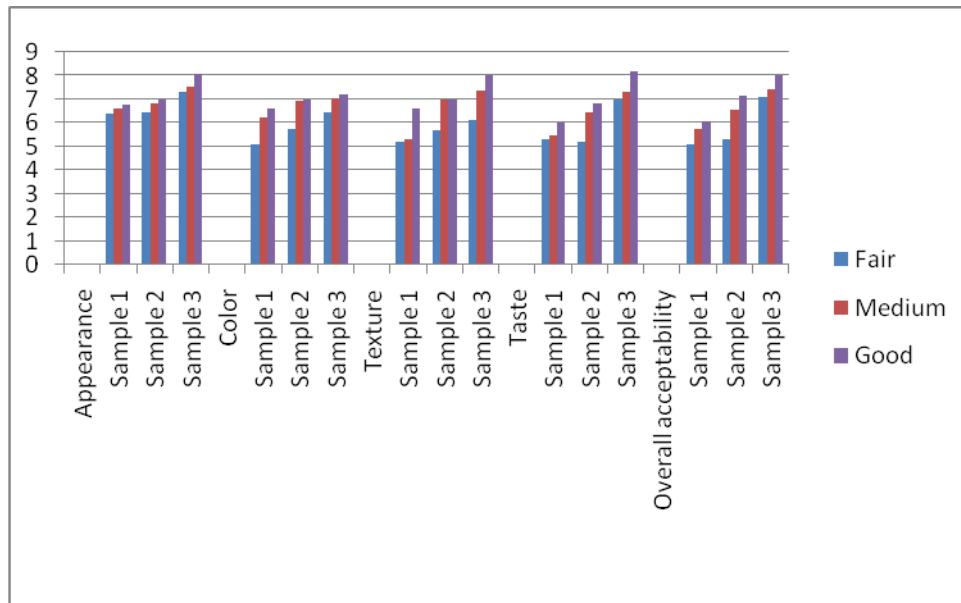
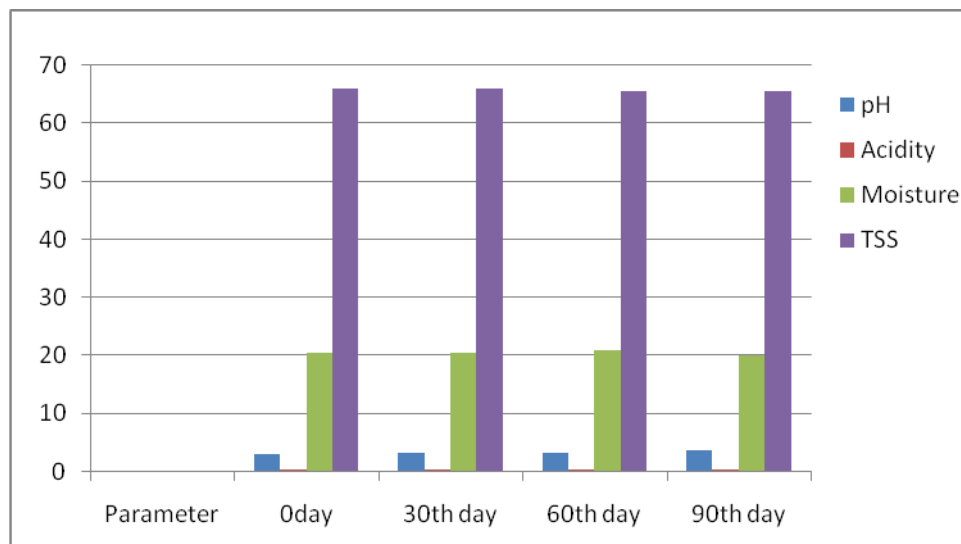


Fig.2 Physicochemical analysis of jam



Physicochemical analysis

Physicochemical parameters involves in present study was-

- pH
- Moisture
- Acidity
- T.S.S.

The physicochemical attributes includes pH, moisture, acidity and T.S.S. content of processed and preserved processed foods was checked at gap of 0 day, 30, 60 and 90 days by pH meter, dry oven, titration and hand refractometer respectively (Fig. 2). Food products are being effectively preserved at low pH. The pH estimation was done in order

to find out whether a low pH was maintained throughout the study which could be an effective preservation. There was change in the pH during the entire storage (Table 5).

In conclusion, the formulation and standardization of recipe for aliv jam was carried out successfully. The health benefits of aliv jam are well known so the products are having some enrichment than the other marketed products.

The economic feasibility can be found Rs. 180/ kg that is more cheaper than marketed jam (Kissan, Mapro, Tops, Malas) so the product can be satisfy the consumer in aspects as quality, cost and health. The aliv fruit has immense potential in multipurpose use. i.e. medicinal and economic. The aliv fruit also play a vital role in the economy of some tribal and rural landless people basically Konkan region.

Recommendations

This product could anybody used by children, adult, and old people but also by patient with diabetes, cancer, neurodegenerative, cardiovascular, aging, gastrointestinal and arthritis.

The aliv jam are cheap in cost and can be used daily to overcome deficiency of nutrients.

These nachos are not only for children but also for all age group.

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